ORGANIZATION OF ARAB PETROLEUM EXPORTING COUNTRIES
(OAPEC)

THE SECRETARY GENERAL'S ANNUAL REPORT 2019

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(OAPEC)

THE SECRETARY GENERAL'S 46TH ANNUAL REPORT 2019

OAPEC Council of Ministers
(2019)

HE MOHAMED ARKAB[1]
PEOPLE'S DEMOCRATIC REPUBLIC OF ALGERIA

HE SHAIKH MOHAMMED BIN KHALIFA BIN AHMED AL KHALIFA
KINGDOM OF BAHRAIN

HE ENG. TAREK EL MOLLA
ARAB REPUBLIC OF EGYPT

HE THAMER ABBAS AL GHADBAN
REPUBLIC OF IRAQ

HE DR. KHALED ALI MOHAMMED AL FADHEL
STATE OF KUWAIT

HE. ENG. SAAD BIN SHERIDA AL KAABI
STATE OF QATAR

STATE OF LIBYA

HRH PRINCE ABDUL AZIZ BIN SALMAN [2]
KINGDOM OF SAUDI ARABIA

HE Eng. Ali Sulaiman Ghanim
SYRIAN ARAB REPUBLIC

HE Eng. Suhail bin Mohammed Faraj Al Mazroui
UNITED ARAB EMIRATES

1. In succession to HE Mustapha Guitouni, as of May 2019
2. In succession to HE Eng. Khalid bin Abdul Aziz Al Falih, as of 8 September 2019

The Executive Bureau
(2019)

HE Mohammed Ras El Kaff
People's Democratic Republic of Algeria

HE Fayhan M. AL Fayhani
Kingdom of Bahrain

H.E. Geologist Ashraf Mahmoud Mohammad Faraj
Arab Republic of Egypt

HE Mahmoud Hashem [1]
Republic of Iraq

HE Dr Sheikh Nimr Fahad Al Sabah [2]
State of Kuwait

State of Libya

HE Sheikh Mishaal bin Jabor Al Thani
State of Qatar

HE Eng. Nasser bin Ibrahim Al Fuzan
Kingdom of Saudi Arabia

HE Eng. Abdullah Al Khattab
Syrian Arab Republic

HE Dr Matar Hamed Al Neyadi
United Arab Emirates

(1) In succession to HE Safa Ahmad, as of 9 September 2019

(2) In succession to the late HE Sheikh Talal Al Athbi Al Sabah, as of 8 October 2019

HE Jawad Omar Al-Sakka	Member
HE DR. Nabil Abdullah El Araby	Member

The Secretariat General

HE Ali Sabt Ben Sabt	Secretary General

The Arab Center for Energy Studies

Dr. Samir M. El Kareish	Director of the Technical Affairs Department
Mr. Abdul Fattah Dandi	Director of the Economic Department

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Mr. Abdul Kareem Ayed	Director of the Information and Library Department

Director of the Finance and Administrative Affairs Department*

* The Finance and Administrative Affairs Department is currently under the supervision of HE the Secretary General

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HE Ali Sabt Ben Sabt
Secretary General

It gives me great pleasure to introduce to you the Secretary General's Annual Report for the year 2019. It provides an overview of the most important Arab and global developments in the oil and gas industry, as well as, a glimpse of the various developments in the global energy industry. The Report's data and statistical charts and tables will give the reader a sense of the vital status and role of OAPEC member countries in the global energy scene.

This Report is released at a time when the world is facing the COVID-19 pandemic. Since December 2019, the whole world has been preoccupied with following up the negative developments of this pandemic. Most countries have taken firm measures in imposing restrictions over aviation while locking down cities, ordering quarantine, stopping flights, and banning travellers. The pandemic affected all economic and industrial sectors in China and the world, including the oil industry.

In this vein, I would like to hail, proudly, the enormous efforts of OAPEC member countries in insisting to carry on with petroleum activities in spite of the pandemic.

In terms of global oil industry, the oil market faced a group of challenges during 2019 as a result of the current developments of the global economy, especially the impacts of: the trade war between the USA and China; the decline in manufacturing and processing to unprecedented levels since the world's financial crisis of 2008; and the uncertainty over BREXIT. This is in addition to restrictions imposed on finance in many key economies due to

high debts, as well as, challenges facing emerging and developing economies, and escalating geopolitical tensions which had noticeable impact on the oil market performance in general.

The year 2019 has also been characterized with the continued active efforts of OAPEC member countries and Secretariat General at the international forums relevant to oil, gas, environment, sustainable development, and the UNFCCC in order to explain the Arab countries' point of view on various energy issues.

This Report aims at highlighting the above-mentioned issues in more detail and analysis to enable drawing a clear image of the energy industry in general, with a special focus on the petroleum industry during 2019. It also sheds the light on OAPEC member countries' efforts to develop their petroleum industry through executing vital projects at the various petroleum industry's stages, as well as, through announcing mega oil and gas discoveries which give another proof of the important and leading status of the Arab region in terms of the oil and gas industry, now and in the future. The members have worked on mitigating the weight of the implications of the difficult economic conditions on most of the oil and gas producing and exporting countries due to declining oil prices in the global market.

The Report also previews OAPEC Secretariat General's efforts - both on the Arab and international levels, and its continued endeavours to strengthen ties and cooperation with regional and international organisations and energy-related research centres.

On supporting research work and expertise exchange between the member countries, OAPEC Secretariat General organised various activities and coordination meetings between specialists from these countries. OAPEC also worked on accentuating its presence at international forums.

This Report is divided into 5 sections tackling: OAPEC activities; economics; upstream industries; downstream industries; and appendices. The sections, supported by charts and figures, give an insight to their respective topics and latest developments with a special focus on OAPEC member countries.

The Report seeks to highlight all the above in more detail, with a special focus on OAPEC's activities; its joint ventures; and its member countries activities and projects. There is a special section covering OAPEC's Arab and international efforts and its relations with the various regional and international organisations and research centres relevant to the energy industry.

You will see that various parts of the Report are dedicated to highlighting OAPEC member countries' new oil and gas discoveries, as well as, new energy projects. This is in order to help draw a clearer image of the progress of the industry in our member countries.

I hope you find this Report helpful and contributing to broadening the readers' horizons on the current Arab and international petroleum industry supported by data and useful pieces of information. I also hope this Report helps a better understanding of OAPEC's activities and goals to make our role clearer in the mind of the reader.

OAPEC ACTIVITIES IN 2019

COUNCIL OF MINISTERS & EXECUTIVE BUREAU

OAPEC's 102nd Ministerial Meeting

OAPEC's 102nd Ministerial Meeting was held in Kuwait on 27 April 2019 and chaired by NOGA Deputy CEO for Strategies and International Relations and Bahrain's Rep at OAPEC Executive Bureau HE Faihan Al Faihani. Bahrain chairs the 2019 term.

The Chair inaugurated the meeting welcoming Their Excellencies the ministers and head of delegations. He expressed thanks and appreciation to the State of Kuwait for the hospitality and warm welcome and to OAPEC for organising the meeting.

OAPEC Secretary General HE Abbas Al Naqi then followed with a speech welcoming Their Excellencies the ministers and head of delegations. HE Al Naqi expressed thanks and appreciation to the State of Kuwait for the hospitality and warm welcome wishing Kuwait prosperity and further development.

The Council then approved the agenda, and deliberated its items as follows:

- OAPEC final accounts 2018 were approved by resolution 1/102 for the year 2018.
- The Council was informed about OAPEC's activities in H1/2019 and approved the Executive Bureau's recommendations in this regard including:
  - Following up environment and climate change issues
  - Reviewing the Secretariat General's report on OAPEC activities including its Conference on "Improving Performance in Downstream Industries" which it organised in Kuwait on 12-14 March 2019 under the auspices of Kuwait's Minister of Oil, Minister of Electricity and Water HE Dr Khalid Al Fadhel
  - Databank progress and activity development
  - LAS meetings
  - OAPEC's completion of 4 economic and technical studies in H1/2019 on:
    A. Primary Energy Consumption Development in Kuwait
    B. The Role of Improved Oil Investments in Developing Hydrocarbon Reserves
    C. Techniques for Treatment of Industrial Wastewater from Petrochemical Projects
    D. Renewables: Reality and Future in the World's Energy Mix and Implications for the Oil Industry
  - The Council reviewed the Secretariat General's report on the signing of an MoU on Petroleum Media between OAPEC and the GCC Council. The Council welcomed the step and OAPEC efforts.
  - The 103rd Meeting will be held in Kuwait on 22 December 2019

The meeting was concluded by reiterating thanks to Kuwait for hosting OAPEC meetings.

Communiqué of OAPEC's 103rd Ministerial Meeting

OAPEC's 103rd Ministerial Meeting was held in Kuwait on 22 December 2019 and chaired by Bahrain's Minister of Oil HE Sheikh Mohammed bin Khalifa Al Khalifa, as Bahrain chairs the 2019 round.

The Chair inaugurated the meeting welcoming Their Excellencies the ministers and heads of delegations. The Minister wished the meeting all success while stressing that OAPEC's ultimate goal is achieving cooperation between its member countries.

He also welcomed Kuwait's Oil Minister and Electricity and Water Minister HE Dr Khalid Al Fadhel who is taking part in the meeting for the first time. The Chair also expressed thanks and appreciation to the State of Kuwait for the hospitality and warm welcome wishing Kuwait prosperity and further development. He also wished the ministerial meeting all success.

OAPEC Secretary General HE Abbas Al Naqi then followed with a speech welcoming Their Excellencies the ministers and heads of delegations. He also welcomed Kuwait's Oil Minister and Electricity and Water Minister HE Dr Khalid Al Fadhel who is taking part in the meeting for the first time wishing him success in his new post. He then expressed thanks and appreciation to the State of Kuwait for the hospitality and warm welcome wishing Kuwait prosperity and further development. HE Al Naqi also reviewed OAPEC's progress and achievements in the last decade and concluded his speech by wishing the meeting all success.

The Council then approved the agenda, and deliberated its items as follows:

- The Council endorsed the minutes of the 102nd Ministerial Council Meeting, held in Kuwait, at representatives' level on 27/04/2019.
- **Taking note of the OAPEC Scientific Award 2018 under the title "Petroleum & Energy Related Research including Supplies, Consumption & Prices" and approved the Award Arbitration Committee's decision to:**

  - Conceal the 1st Prize
- Award the 2nd Prize (KD 5000) to a research study titled "Oil Price Impacts on the Relation between Economic Diversification & Economic Growth: Applied Study on OAPEC Member Countries" by Ms Amina Ali from Bahrain.
- The draft of OAPEC's projected budget for 2020 (Secretariat General and Judicial Tribunal) was approved.
- Al Bassam & Partners were reappointed as OAPEC (Secretariat General and Judicial Tribunal) Auditors for 2020.
- The Executive Bureau was tasked to prepare a plan to activate and develop the role of OAPEC to be submitted at the Ministerial Council Meeting during 2020 with the support of the Secretariat General.

- The Council resolved to extend the period where the Republic of Iraq is assigned to supervise the Arab Oil Training Institute, for one year, with effect from 1 January 2020.

Reviewing the Secretariat General's report on OAPEC activities on:

- Finalized studies prepared by the Secretariat General during 2019 (10 technical and economic studies on oil and energy)
- The Council was informed about the contents of OAPEC Report on the World's Petroleum Conditions.
- Following up environment and climate change issues, most importantly the outcome of the COP-25 held in Madrid, Spain, from 2 to 13 December 2019.
- Databank progress and activity development
- All activities which the Secretariat General organized or took part in during the second half of 2019 (23 events)
- The Council reviewed OAPEC Joint Ventures Activity Report in 2018 and the first half of 2019, and took note of the outcome of the 48th Coordinating Meeting of the Joint Ventures Officials held in Cairo, Egypt, on 28/10/2019, which encouraged continued coordination and cooperation among these joint ventures.
- The Council appointed Mr Ali Sabt bin Sabt as OAPEC's new Secretary General for three years as of March 2020.
- The chairmanship of the next round of the Ministerial Council and Executive Bureau will be assigned to Algeria as of January 2020.
- The Ministerial Council's Chairman sent a cable on behalf of the Council to the Emir of Kuwait HH Sheikh Sabah Al Ahmad Al Jaber Al Sabah, expressing thanks and appreciation for Kuwait's hospitality and warm welcome while hosting the meeting.
- It was agreed to hold the next Ministerial Meeting in Kuwait on 13 December 2020.

Kuwait, 22 December 2019.

153rd Meeting of OAPEC's Executive Bureau

The 153rd Meeting of OAPEC's Executive Bureau took place in Kuwait on 25-26 April 2019. It was chaired by NOGA Deputy CEO for Strategies and International Relations and Bahrain's Rep at OAPEC Executive Bureau HE Faihan Al Faihani. Bahrain chairs the 2019 term.

The Chair inaugurated the meeting welcoming Their Excellencies the ministers and head of delegations. He expressed thanks and appreciation to the State of Kuwait for the hospitality and warm welcome and to OAPEC for organising the meeting.

HE Al Faihani reviewed the most important points for discussion and the recommendations to be submitted to OAPEC's Ministerial Council.

OAPEC Secretary General HE Abbas Al Naqi then followed with a speech welcoming Their Excellencies the ministers and head of delegations. HE Al Naqi expressed thanks and appreciation to the State of Kuwait for the hospitality and warm welcome wishing Kuwait prosperity and further development and wished the meeting all success.

The Council then made recommendations on the points of the agenda.

154th Meeting of OAPEC's Executive Bureau

The 154th Meeting of OAPEC's Executive Bureau took place in Kuwait on 19 October 2019. It was chaired by Bahrain's Rep at OAPEC Executive Bureau HE Fayhan Al Fayhani. Bahrain chairs the 2019 term.

The Chair inaugurated the meeting welcoming Their Excellencies the members of the Executive Bureau wising them a pleasant stay in Kuwait. He expressed thanks and appreciation to the State of Kuwait, represented by its Oil Ministry, for the hospitality and warm welcome and to OAPEC Secretary General HE Abbas Al Naqi and his team for organising the meeting.

OAPEC Secretary General HE Abbas Al Naqi then followed with a speech welcoming Their Excellencies the Chair and members of the Executive Bureau and expressing thanks and appreciation to the State of Kuwait for the hosting the meeting. He wished the meeting all success.

He then reviewed the main discussion points on the agenda including OAPEC's 2020 projected budget (Secretariat General and Judicial Tribunal) and OAPEC Secretariat General's activities in 2019.

The next meeting will be held in Kuwait on 19-20 December 2019, followed by the 102nd Meeting of OAPEC Ministerial Council that will be held in Kuwait on 22 December 2019.

155th MEETING OF OAPEC EXECUTIVE BUREAU

OAPEC Executive Bureau held its 155th Meeting on 19-20 December 2019 in Kuwait. It was chaired by Bahrain's Rep at OAPEC Executive Bureau HE Fayhan Al Fayhani. Bahrain chairs the 2019 term.

His Excellency the Chairman opened the meeting welcoming Their Excellencies the members of the Executive Bureau and wishing them a pleasant stay in Kuwait. His Excellency the Chairman extended thanks to Kuwait for the hospitality and warm welcome. He also thanked OAPEC Secretary General HE Abbas Al Naqi and the Secretariat General's staff for arranging the meeting.

On his part, OAPEC Secretary General HE Abbas Ali Al Naqi welcomed the conveners and thanked Kuwait for hosting and facilitating the Organization's meetings while wishing the event all success.

He then reviewed the main points on the agenda pointing out that the meeting is allocated for OAPEC's 103rd Ministerial Meeting preparations.


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ENERGY
A Dissertation Index

SECRETARIAT GENERAL

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1- Studies:

1-1 The Role of Improved Oil Recovery in Developing Hydrocarbon Reserves

Oil is the mainstay of energy industry, its share of 2017-energy mix was 33%, and expected to be 27% in 2040. World energy demand is increasing due to rapidly increased population especially in China and India. IOR technologies are indorsed by the global oil industry as sensible means to overcome some energy policy concerns. With an average oil recovery factor of 30- 35%, nearly 70% of the known STOIIP remain in the reservoirs. IOR technologies become of significant importance to the global oil supply through their ability to exploit additional reserves from oil fields depleted of more easily recoverable oil. The study was divided into two chapters. Chapter one: introduced the definition of reserves and resources and their various classifications. It also discussed the peak oil theory and criticisms to Hubert's hypothesis. Chapter two: discussed the techniques of improved oil recovery operations and provided a brief explanation of the most common ones, and their role in the development of reserves through many case studies and illustrative examples from around the world. The study also touched on the economics of IOR, and explained the reasons why most of IOR projects take place onshore rather than offshore. In conclusion, the study highlighted the role of IOR in increasing the recovery factor, and reclassifying considerable resources as reserves. It showed that thermal techniques prevailed onshore, while Hydrocarbon gas injection is more preferable offshore.

1-2 Industrial Wastewater Treatment Technologies in Petrochemicals Projects

Industrial wastewater treatment technologies in petrochemicals Industry Wastewater treatment in petrochemicals industry is a complex process, with demanding environmental management challenges as byproducts can be both volatile and toxic. Petrochemical wastewater often

requires a combination of treatment methods to remove oil and other contaminants before discharge. Issues such as groundwater contamination; aromatics; oil, grease and organic matters, and VOC's control have to be addressed in order to comply with environmental regulations. Atypical wastewater system may include neutralization, coagulation/ flocculation, floatation/sedimentation/filtration, clarification and biodegradation (e.g., trickling filter, anaerobic treatment, and aerated lagoon, rotating biological contactor and activated sludge). A final polishing step using filtration, ozonation, activated carbon, or chemical treatment may also be required. This study is divided into three Chapters, including the identification of different types of pollutants in industrial wastewater from various production units in the petrochemical industry, also various production processes, methods, and levels and applied treatment techniques. The study highlighting some successful models and case studies adopted in the treatment of industrial waste water. In order to draw attention to the environmental and economic benefits of implementing these successful strategies in the petrochemical industry and various petroleum industries.

1-3 IMPROVING ENERGY EFICIENCY IN THE PETROLEUM REFINERIES IN ARAB COUNTRIES

Interest in improving energy efficiency in the industrial sector is increasing around the world, especially in petroleum refining, which is known as one of the most energy intensive industry, because large quantities of petroleum refined products, natural gas, refinery gases and electric power are used as energy input in various equipment and processes. The objective of this study is to examine the energy efficiency potential in petroleum refining industry. This is done through trying to understand what drives energy efficiency and to recognize barriers which challenge improvement. To meet this objective, the study answers the following questions:

- Where is energy used in the petroleum refinery?
- What are the main opportunities for improving energy efficiency in the petroleum refineries?
- What is the current status of energy efficiency in Arab petroleum refineries?
- What are the barriers and drivers to energy efficiency improvement?

- What is the potential for energy efficiency improvement in Arab refineries and where do Arab refineries stand in comparison to refineries worldwide?

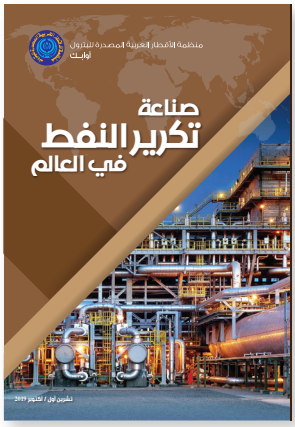
The study highlights the importance and the opportunities of energy conservation in the refining industry which include heat integrations, process optimizations, furnace upgrading and maximization of the efficiency of power generation and cogeneration, optimization of fuel systems, reduction of flaring, minimizing steam and fuel leaks, improvement in insulation material and thickness. Energy efficiency can also be improved through the application of new technology that yields a lower input/output ratio, using the same fuel, improving maintenance programs, and using advanced process control. An energy management standard creates a foundation for improvement and provides guidance for managing energy throughout an organization. A successful program in energy management begins with a strong organizational commitment to continuous improvement of energy efficiency. This typically involves establishing an energy policy, and creating a cross-functional energy team. Steps and procedures are then put in place to assess performance through regular reviews of energy data, technical assessments, and benchmarking. This study includes case studies from Arab refineries and around the world with specific energy and cost savings data. The actual payback period and energy savings for individual refineries will vary, depending on plant configuration, size, location, and operating characteristics. Hence, the values presented in this study are offered as guidelines. The study concludes that the introduction of modern technologies to improve energy efficiency in the Arab petroleum refineries could contribute to reducing energy consumption from 986 trillion BTU per year to 636 BTU per year. The savings amount to about 350 trillion BTU per year, equivalent to 61.19 million barrels of oil equivalent per year at a total value of US $ 3.059 billion per year based on the price of US $ 50 per barrel. The study also offers some recommendations for improving energy efficiency in Arab petroleum refineries, such as, establishing an improved energy information database for communication between refineries and energy specialists, is an important goal to improving energy efficiency in refineries.

1-4 Digital Oil Fields

Digital Oil Fields Companies in the petroleum industry have long recognized the vital role of technology in accessing new resources, improving efficiency, and working in a safe and environmentally sound manner. Such a role is well established in the industry, but a variable is how companies seek progress in this field, the factors affecting the pace and trend of different technologies development, and the mechanism the companies follow to ensure their place on the map of these technologies. This study acknowledged the general concept of Digital Oil Fields and the need for them. It was divided into three chapters: Chapter 1: This chapter defined the digital fields; and provided a historical overview of them from early 80s to date. Chapter 2: This chapter indicated the benefits of these types of fields, their necessity and importance from the point of view of the petroleum industry in the light of the growth of global demand for oil and gas. Chapter 2 also pointed out the most important challenges that stand as obstacles to the application of digital fields technologies. It examined the meaning of the Fourth Industrial Revolution and its role in the value chain. It was made clear that digital fields were not merely a simple concept, and their costs suggested that the application of that concept would not be a substitute to experience. The question of what can be done? must be replaced by the question of: what should be done? Because the large increase in the adoption of cloud computing by petroleum industry seems inevitable. Chapter 3: This chapter examined and highlighted several Arab and international experiences in the digital field technology domain, in an attempt to clarify the image of this technique. It also looked at the digital transformation initiative adopted by the World Economic Forum few years ago, focusing on the oil and gas part of the initiative. Chapter 3 showed that adopting digital field techniques contributes to low operating costs, early production, increase of production rate and increase of recovery factors. This chapter pointed out that Digital field techniques may also reduce capital for development, and cut down costs of field abandonment. Furthermore, a significant increase in the value of assets and properties can be achieved when the reservoirs are managed in real time.

1-5 Unconventional Gas Production Boom in the US and its Implications on the Global LNG Market

Over the past decade, the US has experienced unprecedented boom in unconventional gas production, thanks to the technological advances in horizontal directional drilling (HDD) and hydraulic fracturing. Consequently, the US has surpassed Russia in 2009 as the world's top natural gas producer. While in 2017, it has become a net gas exporter for the first time in almost 60 years. Doubtless, the advent of shale gas has changed the energy scenario in the United States and its implications have extended to affect the global energy markets. In 2016-2018, the US LNG exports increased from 0.3 MT to 20.65 MT to become the fourth largest LNG exporter worldwide. By 2021, United States is set to become the third largest LNG exporter, and probably the top exporter in few years beyond that date. The study is divided into three chapters: chapter-I overview the different types of unconventional gas resources and their technically recoverable volumes worldwide. It also addresses the technologies used to exploit these resources such as horizontal directional drilling (HDD) and hydraulic fracturing. Chapter-II addresses the unprecedented surge in gas production in the United States from unconventional resources, particularly shale gas and the key success factors that enabled the US to achieve such boom. Chapter-III addresses the implications of US shale gas boom on the global LNG market in the short and long term. It also highlights the regulatory federal procedures to implement a LNG export project and various project commercial structures.



1-6 World Oil Refining Industry

Oil refining industry is one of the most effective industries in the world and it has an important role in energy market. Oil refining industry has been under considerable pressure for decades. The refineries need heavy investments for improving the environmental features of the fuels they produce and reducing direct emissions to the environment. This study explains the development of oil refining industry in the world's regions, defined here as Africa, Asia Pacific, Eastern Europe, Middle East, North America, South America and Western Europe. The main purpose of this study is to examine the reasons behind the main challenges facing

the refining industry in the world, address the necessary measures needed for improving the performance. The study also includes updated information relating to all active and planned refineries in each region, historical data on supply/demand balance of petroleum product from 1995 to 2018 and forecast to 2040. The world's demand for petroleum products will keep growing, especially in Asia Pacific, Mideast and Africa regions. The demand will increase for Gasoline and Diesel while it will decline for residue. Overall trend in demand is clearly toward higher-quality fuels. Shrinking demand, which in turn reduces the opportunities for refiners that are big exporters to these regions, will have significant impact on refiners within the United States and Western Europe. Most of the refineries in Africa, Eastern Europe and Middle East built 30 to 40 years ago with small scale, and using less sophisticated technology. Consequently, aging refineries have been suffering from higher maintenance and operating costs than refineries built recently. Currently, the refining sector in these regions has several problems:

- Most of the operating refineries have limited capacities for converting bottom-of-the-barrel fractions of oil into light products. They largely rely on catalytic reforming and hydrotreating processes rather than catalytic cracking, hydrocracking, and thermal operations.
- The share of heavy fuel oil in refinery output is higher than its level in Western Europe and North America.
- Petroleum products quality is well below European standards and some of refineries still produce low-octane, leaded gasoline. During the last two decades, investment in refineries has never been attractive in regions where market forces decided the product prices.

Starting in the early 1980s, North America and Europe lowered their excess capacity while improving their performance and ability to produce higher quality refined products. The North America and Western Europe regions have seen a closure of many refineries in recent years, while the operating refineries have been struggling to survive by improving its performance and flexibility to be more efficient and more able to adapt to changing market needs. At the same time, refining capacity continued to expand in the Middle East and Asia Pacific. In addition to building new refineries, most

of the developing countries have actively started expanding the capacity of their active refineries, implementing the latest and most efficient technologies, and maximizing the refinery and petrochemical integrations in attempt to maximize the production of lighter refined products, achieve economic diversification, meet environmental protection obligations and achieve a competitive advantage amongst industry players. On the other hand, refining sectors in Middle East and Asia-Pacific enjoy a number of key advantages, including the availability of skilled and cheap labor, large reserves of capital and rapidly growing local demand. These advantages have encouraged the national oil companies in these regions to build a strategic alliance with the international oil companies, so that they can gain more competitive advantages, generate more economic growth for both parties, and share risks and rewards fairly. In the developing countries, such as Africa, Asia Pacific, Eastern Europe, and Middle east, a strong focus now on building new refineries and upgrading their active refineries to help ensure their survival today and profitability in the future. The expansion projects also aimed at improving the ability of the refineries to produce high quality fuels, meet the growing local market demand of petroleum products and enhance its competitiveness in the international markets. As concluded in this study, in order to improve the operation and financial viability of the oil refining industry in these regions, the following key issues should be addressed:

- Develop a strategy for closure of unprofitable or environmentally unacceptable facilities.
- Prioritize investments to match market need, environmental timetables, and financial return.
- Reduce pollution attributable to the industry through environmental protection legislation.
- Competition must be introduced wherever practicable.
- Additional fund is needed to address pollution control at the refining sites.
- Reasonable security of supply must be ensured.
- An international forum must be created for exchange of views on common regional problems.
- Technical training programs at every level must be established.

1-7 Development of Primary Energy Consumption & its Prospects in Kuwait

The study is divided into 2 parts. Part 1 analyses the various types and trends of energy consumption in Kuwait (between 1980-2018); as well as, energy mix development; consumption density; and key factors influencing consumption levels. Part 2 tackles energy consumption forecasts in Kuwait until 2040, and the final results of future forecasts on total primary energy consumption in Kuwait.

1.8 Development of Primary Energy Consumption & its Prospects in the UAE

The study is divided into 3 parts. Part 1 analyses the various types and trends of energy consumption in the UAE (between 1995-2019); as well as, energy mix development; consumption density; and key factors influencing consumption levels. Part 2 tackles energy consumption forecasts in the UAE until 2040. Part 3 covers the methodology and approach to future forecasts on energy consumption, as well as, tackling basic hypotheses on the main 4 future scenarios: the referential scenario; the high growth scenario; low growth scenario; and the scenario on renewables national goals policy. The study concluded by introducing final results on future forecasts on primary energy consumption in the UAE and its main sources, i.e. oil, natural gas, renewables, and nuclear as per the above scenarios.

1-9 Energy Conservation & Improving its Efficiency in OAPEC Member Countries

The study aims at looking into available potentials to improve final use of energy in OAPEC member countries on one hand, and proposing a group of recommendations to improve energy efficiency on the other hand. 6 pivots covered these aspects:

- Defining energy conservation; energy efficiency; and the gains out of the process
- Most significant developments in the key economic indices in the member countries (between 1980-2018)

- Energy consumption development in OAPEC member (between 1980-2018)
- Sectoral distribution of the final energy consumption
- Developments in the main indices of energy consumption efficiency in the member countries
- Stating available opportunities to improve energy consumption efficiency

1-10 Renewables' Reality & Future Prospects in the World's Energy Mix & their Potential Implications for the Oil Industry

The study highlights forecasts on the global demand for the various types of energy, especially renewables (between 2017-2040) as per various scenarios. This is to identify potential implications for global demand for the oil market in general, and fossil fuel in particular. Part 1 of the study defines the various types of renewables; part 2 reviews the development of the world's energy market (between 2017-2040). Part 3 is allocated for analysing the various scenarios on primary energy demand according to international blocs, as well as, focusing on the projected type of energy mix in the electricity sector. Part 4 tackles potential implications for adopting sustainable development scenario on the oil supplies and crude trade from OAPEC members on the one hand, and investments in the oil sector of the member countries on the other hand. Part 5 elaborates on the abundant renewable resources in the member countries, their uses in the Arab countries, especially OAPEC members.

2- Papers

2-1 Paper on "Current and Future Trends of Sustainable Natural Gas & LNG Production in the Arab Countries"

Presented at the 6th Session of UNECE Group of Experts on Gas, 25 - 26 March 2019, Geneva, Switzerland.

2-2 Paper on "Current and Future Role of the Arab World in Meeting Europe's Gas Needs"

Presented at the 34th International Scientific and Expert Meeting of Gas Professionals, 8 – 10 May 2019, Opatija, Croatia.

2-3 Paper on "Current Role of Smart Fields in Exploration & Production"

Presented at MENA's Leading Well Intervention Conference (OWI MENA 2019), 6- 7 October 2019, Abu Dhabi, the UAE.

3- Conferences, Seminars, & Meetings

3-1 Fourth Round of the Arab Economic and Social Development Summit, Beirut, 20 January 2019

3-2 the 103rd Ordinary Term of the Economic and Social Council at the Level of Permanent Reps and Senior Ministerial Officials, Cairo, Egypt, 3-7 February 2019.

3-3 Second International Seminar on Natural Gas, Equatorial Guinea, 29 November 2019

OAPEC Secretariat General took part in the event, which is held for the first time in Africa, Equatorial Guinea, on the side-lines of the 5th Summit of the Gas Exporting Countries Forum.

3-4 Fifth GECF Gas Summit, Equatorial Guinea, 29 November 2019

OAPEC Secretariat General took part in the event that tackled the vital issues in the presence of high-profile official delegations form GECF members, including Algeria, Egypt, Libya, Qatar, Russia, Trinidad and Tobago, UAE, Venezuela, Angola, Azerbaijan, Norway, and Oman.

Upon the end of its sessions, the summit issued Malabo Declaration reiterating the following:

- Absolute GECF sovereign and permanent rights of their natural gas resources
- Natural gas plays key role in realising the UN's sustainable development goals, especially number7, as gas is a natural, environment-friendly, affordable, accessible, and flexible resource to ensure economic development and social advancement
- Gas has a vital importance in developing relevant infrastructure to ensure global energy security and a more sustainable and flexible energy systems
- Indispensable natural gas contribution in environment protection, especially mitigating and adapting to climate change impacts
- Pioneering role of the GECF members having the largest share of the world's natural gas resources, production, trade, and their willingness to develop these resources in the interest of both, producers and consumers.

3-4 5TH ANNUAL GCC ENERGY STRATEGY FORUM 2019

OAPEC Secretary General took part in the Petroleum Economist's 5th Annual GCC Energy Strategy Forum held on 5 February 2019 in Kuwait under the patronage of the Kuwaiti Oil Minister and Minister of Electricity and Water HE Dr Khaled Al Fadhel. Mr Hashem Sayed Hashem, Deputy Chairman and Chief Executive Officer at Kuwait Petroleum Corporation represented HE Al Fadhel at the event and delivered a speech on the minister's behalf.

OAPEC Secretary General HE Abbas Al Naqi gave a speech at the opening of the forum summing up OAPEC and its member countries' role and contributions to the world energy market as they account for about 705 billion barrels of oil, or 47.9%, of the world's total reserves with the OAPEC GCC members' share representing about 33.7% of the world's total oil reserves. He added that the member countries have about 53 trillion cubic metres of proven gas reserves, or 26.4% of the world's total reserves, with the OAPEC GCC members' share representing about 20.6% of the world total.

As for the future of the oil sector globally, HE Al Naqi sees that oil will remain the largest source of energy supported by growing demand by petrochemicals and transportation with a share of 28% by 2040. He stressed that fossil fuel (oil, gas, and coal) will remain the main component of the world's energy mix with a share of 75% by 2040. As for oil and gas combined, it is expected that they will form 50% of the global energy mix in the same year. The Secretary General pointed out that total energy investments in the MENA region will be about $345 billion between 2018 and 2022. The oil sector accounts for most of the investment by about $131 billion, followed by gas ($106 billion), energy ($95 billion), and petrochemicals ($14 billion). He clarified that the investments of OAPEC members from the GCC region are $170 billion, representing about 50% of the MENA region's total investments.

OAPEC Secretariat General was represented by a delegation headed by His Excellency the Secretary General, and members including the Director of the Technical Affairs Department Dr Samir Al Karaesh; Senior Refining Expert Eng. Emad Mekki; Petroleum Expert Eng. Turki Al Hemish; Petrochemicals Expert Dr Yasser Al Baghdadi; and Gas Industries Expert Eng. Wael Abdul Mo'ati. The

delegation also included Miss Ala'a Al Omran, Press and Translation Affairs Coordinator, representing the Press and Library Department.

3-5 ME-TECH 2019

OAPEC Secretariat General took part in the Middle East Technology Forum for Refining & Petrochemicals (ME-TECH 2019) held on 26-28 February 2019 in Abu Dhabi, the UAE. The event, organized by Euro Petroleum Consultants, included 2 plenary sessions, 4 sessions on refining, and 4 sessions on petrochemicals.

The first session titled "Technical Support Methods for Lengthening the Lifespan of Assets Used in Downstream Industries" tackled developments in the petroleum products market, petrochemicals, the industry's trends and forecasts, the role of strategic partners and foreign investments in developing the industry, new methods of profitability, diversification of downstream industries, and conversion of products into new ones.

The second plenary session titled "Integration between Refining and Petrochemicals" was allocated for reviewing modern technologies in producing polymers and their different uses. It also discussed the conversion of crude into chemicals, growing use of electric vehicles, new expansions of projects and their role in changing the market. About 16 presentations on the latest technological developments in the downstream industries were given.

Dr Yasser Al Baghdadi, Petroleum Industries Expert, represented OAPEC at the forum which is held for the ninth year. ADNOC was this year's strategic partner.

3-6 22nd International Conference on Petroleum, Mineral Resources and Development

OAPEC Secretariat General took part in the "22nd International Conference on Petroleum, Mineral Resources and Development" held by the Egyptian Petroleum Research Institute (EPRI) in Cairo, Egypt, on 26-28 February 2019, under the auspices of Egypt's Minister of Petroleum and Mineral Resources HE

Engineer Tarek El Molla, in the presence of OAPEC Secretary General HE Abbas Al Naqi and EPRI's Acting Director HE Dr Yasser Mostafa. Various petroleum issues have been tackled at the conference.

In the opening session, HE El Molla pointed out that the Egyptian petroleum sector is building up an ambitious strategy to fulfil "Egypt's 2030 Vision" to utilize natural resources for achieving sustainable development goals. He added that the ongoing project on upgrading and developing the Egyptian petroleum sector is progressing towards tangible fruitful results in: attracting investments; supporting youth careers to assume leading duties (in order to boost the development of natural resources); in addition to maximising the resources added-value.

He drew the attention to recent unprecedented results in the petroleum industry in Egypt, on top of which: halting LNG imports and self-sufficiency (through the growing domestic production from significant discoveries in the past two years), which should help Egypt starting to export the surplus.

The minister also stressed the importance of modern technology in developing the petroleum industry and the necessity of linking scientific research with the petroleum industry to keep in pace with the latest in exploration, drilling, production, and to improve the petroleum products' quality to be more feasible economically.

It is worth mentioning that the conference importance stems from the topics it tackled including: developing the energy sector to contribute to the country's development plan; building a competitive diverse economy; and the Afro-Egyptian partnership to underscore the Egyptian role in Africa.

Conference president and EPRI's Acting Director Dr Yasser Mostafa said in his speech that the conference is an annual scientific forum that gathers an elite of scientists and expert researchers in various aspects to discuss the most important global scientific research studies. He added that it provides a platform for discussions between experts and officials, decision makers, industry and production businessmen to come up with time- bound recommendations followed up for execution by a permanent conference secretariat that also informs all relevant authorities in the country in order to contribute to the development process in Egypt.

He stressed that EPRI has a future vision in line with Egypt's 2030 Vision on sustainable development and the country's scientific research strategy that relies on creativity, knowledge, good-planning, and linking scientific research to the petroleum industry's needs.

He clarified that maximising the benefit out of scientific research and patents via transforming them into outcomes represent the economic pillar of EPRI. This is in addition to research departments, EPRI's specific-purpose centres, and the projects that EPRI provides to the petroleum, industrial, and civil sectors.

On his part, OAPEC Secretary General HE Abbas Al Naqi gave a speech at the opening session thanking the organisers for the invitation. He pointed out that the conference comes at a time when the global petroleum industry is witnessing some kind of stability as a result of a relative improvement in oil prices recently. This has reflected on the future projects' forecasts in the Arab countries and the world in spite of some difficulties in global markets and certain geographical spots. HE Al Naqi pointed out that there have been different levels of activities in the Arab petroleum industry, adding that Arab countries enjoy a prestigious status on the global energy map, most importantly in terms of hydrocarbons (oil and gas), supported by their large proven reserves which they use to export to the world. He then mentioned some global petroleum indicators and the role of Arab countries in them.

HE Al Naqi concluded by stressing that the purpose of these vital projects in the Arab countries is not only to diversify national income, maximise the benefits of available resources, and create new job opportunities, but also to achieve the sustainable development's social, economic, and environmental aspects in line with the growing global interest in achieving the sustainable development 2030 goals, especially goal number 7 ensuring everyone gets modern, reliable, and sustainable energy at affordable costs.

OAPEC Secretariat General has contributed with a paper on the "Role of Partnership between National and Global Petroleum Companies in Improving Downstream Industries in OAPEC Member Countries" by Dr Samir Al Kareish, Director of the Technical Department. The paper tackled challenges facing downstream industries (refining and petrochemicals) that call for enormous cooperation between national and

global companies, for example in terms of strict regulations on environment, occupational safety, and working in a complex and difficult workplace.

3-7 6th Session of UNECE Group of Experts on Gas

OAPEC took part in the UNECE Group of Experts on Gas on 25 –26 March 2019, Geneva, Switzerland. Representatives of the UNECE, European Commission, and various international organisations including The International Gas Union (IGU), Gas Exporting Countries Forum, International Association of Oil and Gas Producers, the International Group of Liquefied Natural Gas Importers (GIIGNL), GIE, and international oil companies' experts, as well as, academics participated in the event.

OAPEC Secretary General HE Abbas Al Naqi gave a speech at the opening session along with Mr Scott Foster, Director, Sustainable Energy Division, UNECE, and Mr Francesco di la Flore, Chief UN Gas Experts Group. HE Al Naqi reviewed the most significant gas industry indicators in the Arabian region, stressing the pivotal role played by gas in achieving sustainable development goals, especially goal number 7 on sustainable energy, and goal number 8 on sustainable economic growth. He underscored the importance of gas in supporting economic ties between Arab and European countries.

HE Al Naqi concluded his speech by stressing that natural gas enjoys a good status in comparison to other energy resources, and it is eligible to play a pivotal role in the future energy system due to its high efficiency, availability (in various areas), and compliance with environmental goals and regulations.

On their part, Mr Foster and Mr di la Flore lauded the participation of HE Al Naqi and his speech that gave important messages on the role of gas in the Arab region's sustainable development and in boosting EU-Arab ties.

Engineer Wael Hamed A. Moati, Gas Industries' Expert from OAPEC, presented a paper at the event on "Current and Future Trends of Sustainable Natural Gas and LNG Production in the Arab Countries" at Day 2 session titled "Update on Activities in ECE Member States, Gas Industry and Organizations." The paper tackled the gas and LNG production boom in Arab countries, measures on exploiting natural gas resources and raising production rates

sustainably, as well as, current projects on LNG sustainability.

Engineer Moati also represented OAPEC at a workshop on 27 March 2019, organised by the UN, GIE, and MARCOGAZ on "Managing Methane Emissions in Gas Sector." He presented a paper on the "LNG Sector in Arab Countries: Qatar's Jetty Boil Off Gas Treatment" tackling liquefication development in the Arab countries, their share in global LNG markets, and a case study on Qatar's globally unique Ras Laffan jetty boil off gas treatment project, worth $1 billion of investments.

3-8 34th International Scientific & Expert Meeting of Gas Professionals

The 34th International Scientific and Expert Meeting of Gas Professionals with an extensive international exhibition of gas equipment and technologies was held in Opatija, Croatia, from 8 – 10 May 2019 under the patronage of His Excellency the President of Croatia. The event was organized by the Croatian Gas Centre Ltd and the Croatian Gas Association (CGA), member of the International Gas Union (IGU). It was inaugurated by the Croatian Environment and Energy Minister.

OAPEC Secretariat General was represented by Eng. Wael Abdul Moati, Gas Industries' Expert. He presented a paper on the "Current and Future Role of the Arab World in Meeting Europe's Gas Needs" explaining the industry's development in the Arab countries and their role in meeting Europesan gas needs.

Various technical presentations were given at the meeting while the meeting sessions discussed the current status and future prospects of the gas industry in the EU and the world. Topics discussed also covered: using gas with renewables; smart technology in the gas sector; creativity; technology transfer; and transportation. The accompanying exhibition consisted of 45 stands from 20 countries.

3-9 MENA'S LEADING WELL INTERVENTION CONFERENCE (OWI MENA 2019)

OAPEC took part in the MENA's Leading Well Intervention Conference organized by Offshore Network Ltd, in Abu Dhabi, the UAE, on 6-7 October 2019.

The conference, which was attended by a large number of participants, focused on four pivots:

1. Production enhancement solutions
2. Digitalization
3. Collaboration between organizations
4. Late life recovery or P&A?

OAPEC's paper was part of the second pivot under the title "Current Role of Smart Fields in the Upstream Industry" and it was presented by Eng. Turki Hemish, Petroleum Exploration and Production Expert.

The conference included training comprising of a workshop on helping companies to face critical regional challenges.

3-10 Quarterly Meeting of the Industry Trends Committee

OAPEC took part in the meeting of the Industry Trends Committee at the Gulf Refining Union in Abu Dhabi, the UAE, on 27-28 November 2019. A group of renowned companies took part in the event including: IHS, Shell, BCG, and Stratas Advisors.

The meeting discussed the committee's activities including a study on digitalising refineries; the committee's report on the Reduction Scheme for International Aviation (CORSIA); and a draft report on increasing the added value to Sulphur products produced by the GCC refineries, whose production is expected to grow soon. Dr Yasser Al Baghdad, Oil Industries Expert from the Technical Affairs Department, represented OAPEC at the meeting.

3-11 2nd Gas & LNG Middle East Summit

OAPEC Secretariat General took part in the 2nd Gas & LNG Middle East Summit held in Muscat, Oman, on 9 and 10 December 2019.

It gathered key industry players- both regionally and globally- including: the Gas Exporting Countries Forum, PETRONAS, KAPSARC, and Omani oil and gas experts.

The Summit consisted of 6 sessions on natural gas and LNG industries and trade, their role in achieving sustainable development, the role of the Middle East in securing regional and global energy demand, LNG

infrastructure development projects in the region, as well as, the competitive marketing environment.

Dr Samir Al Kareish, Director of the Technical Affairs Department, represented OAPEC at the event. He chaired the first session on Day 1 on "Natural Gas Markets: Trends & Opportunities" where speakers reviewed MENA's huge natural gas potentials and resources and their impact on the industry's sustainable growth. They also tackled future trends, challenges, and key opportunities in the global gas market.

3-12 Gulf Refining Union's Annual Meeting

OAPEC Secretariat General took part, as knowledge partner, in the Annual Meeting for the Gulf Refining Union's Technical Committees Liaison Officers and Experts on 11 December 2019 in Manama, Bahrain.

The meeting was attended by the Gulf Refining Union's board of directors' members, liaison officers and experts of the technical committees, ARAMCO, BAPCO, KNPC, ADNOC, and other Arab and international companies and organisations.

Dr Samir Al Kareish, Director of the Technical Affairs Department, represented OAPEC at the event. He took part in a session on "The Role of Specialized Technical Committees in Identifying Key Challenges Facing the Refining Industry."

3-13 Kuwait Blue Hydrogen Symposium

OAPEC Secretariat General took part in the Kuwait Blue Hydrogen Symposium held at Kuwait Petroleum Corporation on 12 December 2019, in collaboration with Kuwait Foundation for the Advancement of Sciences (KFAS), Japan Cooperation Center Petroleum (JCCP), and Kuwait Oil Company (KOC).

Many experts, senior officials and policy makers from local and international corporations, governmental bodies, industrial private sector, OPEC, Oxford Institute for Energy Studies, IEA, and other bodies took part in the symposium.

The goal of the symposium was to provide an overview of the hydrogen industry and the latest developments that are expected to contribute to the development of the industry. It also aimed at highlighting opportunities producing blue hydrogen from oil and gas resources. The symposium discussed technical, economic, and legislative challenges facing the commercial production of hydrogen. It also assessed potential plans for blue and green hydrogen production in Kuwait.

The symposium consisted of four sessions that presented 12 technical papers, in addition to a closing dialogue session with a number of experts. The closing session discussed the most important proposals and recommendations of the symposium which would contribute to helping policy makers in identifying opportunities for Kuwait to enter the hydrogen economy.

OAPEC Secretariat General was represented by the Director of the Economic Affairs Department Mr Abdul Fattah Dandi, and Senior Refining Expert at the Technical Affairs Department Eng. Emad Mekki.

4- Environment, Climate Change, and Sustainable Development: OAPEC Role

4-1 50th Session of the UNFCCC Subsidiary Bodies

The 50th session of the UNFCCC Subsidiary Body for Implementation (SBI) and Subsidiary Body for Scientific and Technological Advice (SBSTA) convened in Bonn, Germany, from 17-27 June 2019. More than 4500 participants attended the event. OAPEC participated as Observer and was represented at its activities.

The Bonn Climate Change conference addressed numerous implementation issues under the Convention, the Kyoto Protocol and the Paris Agreement that is supposed to be completed in Santiago Conference, Chili, in December 2019.

Progress has been made in a number of issues discussed including:

- Carbon market mechanisms: The Paris Agreement (Art. 6) allows countries that so wish to engage in "cooperation" that results in reductions in CO2 emissions, which can then be transferred to the international level. The rules for the application of this article are the only ones that have not been adopted by the UNFCCC within the Katowice Package. The parties presented their points of view on Art.6 to be discussed in the next COP.
- Loss and damage: The " Warsaw International Mechanism for Loss and Damage " has been established, at the request of developing countries, and is currently confined to a role of collecting and disseminating information on the subject.
- The parties agreed the reports' schedules and other issues in connection to transparency according to the Paris Agreement to be discussed in the next COP.
- The countries welcomed the Koronivia joint work on agriculture and organizing a workshop on land and water sustainable management; expanding the scope of practices and technologies for more flexibility and sustainable production.
- Disagreement on the future budget funding on managing the UNFCCC. Negotiations ended with a mere 5% increase for the period 2020-2021.
- The parties could not introduce many issues on the

membership of the Adaptation Fund's Board of Directors nor a final common timeframe for the Nationally Determined Contributions (NDCs).

On the IPCC report that has made essential to limit global warming to 1.5°C, it was agreed that it is the science's best knowledge and stress should not be put on the uncertainties.

The countries decided to postpone discussions on the next periodic review of the long-term global goal under the Convention.

Many technical problems remain unresolved and should be fully tackled in the next COP25 in Madrid.

4-2 The 26th Coordination Meeting of OAPEC Environment and Climate Change Experts

In line with the action plan of the Organization of the Arab Petroleum Exporting Countries (OAPEC) for the year 2019, the 26th Coordination Meeting of OAPEC Environment and Climate Change Experts took place in Kuwait, on 13 and 14 October 2019 with the participation of experts from Kuwait, KSA, and Qatar, in addition to representatives from the GCC Council's Secretariat General.

Following extensive discussions on climate change issues, the participants underscored the components of the Arab negotiating stance that has been endorsed at the Arab League economic and social council meetings. Most importantly:

- Developing the skills of the Arab Negotiating Group in terms of applied topics relevant to assessing the impact of climate change on the various sectors in the Arab countries, impacts of executing response measures, economic diversity, identifying the activities to be enlisted under NCs.
- Working on the sustainability of national and regional institutional action to serve climate issues in the Arab world, especially in the transition from discussing negotiation texts to application issues that have direct or indirect impact on Arab interests.
- Coordinating with scientific and research institutions and relevant Arab and regional organisations to support national climate change efforts.

4-3 The 23Rd Meeting of Arab Negotiating Group & 13Th Workshop of Arab Negotiating Group on Evaluation of Climate Funding Requirements

- Upon an invitation by the League of Arab States, OPAEC Secretariat General took part in the 23rd Meeting of the Arab Negotiating Group held in Cairo, Egypt, on 1-7 November 2019. Members of the Arab Negotiating Team tasked with following up the Paris Agreement on Climate Change participated in the event.
- Representatives of the Arab countries, the Arab League, ESCWA, and OAPEC Secretariat General participated in the meeting.
- The meeting discussed the latest developments in the climate change negotiations on international level and the Arab move in this regard. Various issues were tackled including: the outcomes of the 50th session of the UNFCCC Subsidiary Body for Implementation (SBI) and Subsidiary Body for Scientific and Technological Advice (SBSTA), a glimpse of the carbon markets and pending issues relevant to article VI of the agreement, 2019 report on cutting CO2 emissions by 45% by 2030 against to 2010 levels to reach point zero by 2050. Discussions also covered the IPCC report, the New York Climate Summit in September 2019, and the world trade issues influencing the progress of the climate change negotiations.
- Following extensive discussions, the Arab Negotiating Team prepared a plan for the Arab stance and moves at the climate change negotiations and on tackling climate change issues during the next COP in Madrid, Spain, in December 2019.

5- MEDIA ACTIVITY

The Secretariat General continued its media activities in 2019 on both Arab and international levels through the Information and Library Department. The department supervises all publications and periodicals prepared by the Secretariat General in collaboration with other concerned departments. It follows up the Arab and international petroleum industry's developments, energy affairs, and their economics. The department keeps a close eye on whatever published in this connection in the media. It is also in charge of documentation, bibliography, current affairs reporting, and providing references and journals to researchers from inside and outside the organization.

5-1 Editing, Printing, Publishing and Distribution

The Secretariat General continued to issue all OAPEC publications, including books and periodicals. This action involved all matters relating to editing, proofreading, translation, designing, printing, publishing and distribution.

5-2 Press and Media Activity

A number of press releases were issued by the Secretariat General, covering the various activities of the organization, such as the meetings of OAPEC Council of Ministers, the meetings of the Executive Bureau, and the Golden Jubilee celebrations. On the other hand, local and Arab newspapers highlighted OAPEC activities, its role in coordinating between its member countries, and its efforts towards supporting the joint Arab action. The Secretariat General continued to monitor the contents published by local, Arab and foreign newspapers on energy affairs, and collected and archived the top oil, economic and environmental stories, as well as, other topics that are relevant to member countries in general.

5-3 Website

The Secretariat General's electronic website has continued usual activities by covering the latest OAPEC and its member countries' news and activities. It also provides the latest data on the oil and gas industry in the member countries and other Arab countries through

a link to the organisation's databank and book lists at the library. A summary of the organisation's latest economic and technical studies is also provided.

5-4 Social Media

In order to facilitate direct communication with its audience, OAPEC Secretariat General has continued to improve its Twitter and Facebook accounts, where the latest news and activities are highlighted. There has been good feedback and interaction so far from followers and those interested in the energy and petroleum industry.

5-5 Information and Documentation

The Library continued to serve OAPEC and non-OAPEC researchers, whether from our staff, petroleum and non-petroleum staff, academics, or those interested in the field from inside and outside Kuwait. Our services include responding to queries through utilising the Library's resources.

The library also provides information recovery services for researchers, and the following documentation services: quarterly bibliography published in the Oil and Arab Cooperation Journal, and the Library's new references' bibliography that is distributed to all the Secretariat General's researchers on a quarterly basis.

5-5-1 Indexing and Classification

The Library continued to provide technical services related to indexing and classifying and fed the data of all books and documents into the Library's Oracle database. Entries for old books and documents have also been made into the Library's e-database.

The number of references increased from 31000 to 31500 books; and from 5750 to 5850 documents.

5-5-2 Acquisition

The Library's acquisition focused on the following this year:

- Providing the Library with new books as proposed by the Secretary General's Office and relevant departments.
- Following up on the subscriptions and renewal of Arab and foreign periodicals.
- Monitoring official publications of the governmental authorities and departments, as well as oil companies
- Monitoring and downloading the electronic periodicals and studies

received on the Secretariat General's intranet and make them available on the Secretariat General's e-Library.

5-5-3 Public Services

The Library continued to provide in-house services for the Secretariat General's researchers, visitors, and external delegates through the following services:

- In-house borrowing (e-borrowing made available to facilitate the process)
- Responses to researchers' inquiries
- Readers' guiding
- Reference services
- Binding (limited)
- Photocopying (limited)

5-5-4 E-Library

The library works continuously on expanding its collection of electronic references, especially on energy, petroleum, petrochemicals, environment, and other relevant topics; in order for the e-library to integrate with the paper library.

E- copies of printed references are downloaded whenever available; a step towards full digitalising of the library.

In coordination with the IT manager, the library works on developing Oracle used in classifying references to better serve the researcher.

6- Databank

6-1 Boosting Cooperation between OAPEC & its Member Countries

OAPEC Secretariat General held its Seventh Coordinating Meeting for OAPEC Databank Liaison Officers on 18 and 19 September 2019 at the organization's headquarters in Kuwait. The meeting was attended by seven liaison officers from the UAE, Bahrain, Algeria, Kuwait, and Egypt.

The meeting mainly aimed at: following up and reviewing earlier recommendations issued by previous coordinating meetings; evaluating OAPEC member countries data flow mechanism; better communication between the officers; discussing the new energy data collection form and the system's technical gaps and statistical shortages; as well as, listening to remarks and future visualizations on developing the system's application to meet the member countries' needs of energy and oil-related data.

The meeting made a number of recommendations including continuing to provide the Secretariat General with oil, natural gas, and other energy resources data and statistics while working on overcoming any obstacles preventing smooth access to these statistics.

6-2 Reports

The Databank, in collaboration with the relevant departments in the Secretariat General, completed the statistical report for 2019, covering the period 2014-2018, which has been uploaded on the Secretariat General's website.

The Energy Data publication was also prepared by the Databank, according to international groups, for the period 1980-2018, relying on the BP database. This publication is annually updated. It was uploaded on CDs. As per the agreement with BP, the distribution of this publication will remain limited to member countries.

6-3 Boosting Cooperation between OAPEC & International Organisations

- 14th Joint Organizations Data Initiative Conference (JODI), Cairo, Egypt, 20-21 October 2019.
- Organized by the IEF in collaboration with organisations sponsoring the Joint Organizations Data Initiative (JODI) and the Egyptian Ministry of Petroleum and Mineral Resources.
- OAPEC presented a paper at the opening session on the role of OAPEC Databank in collecting oil and energy data in the member and Arab countries. OAPEC was also present at the associate exhibition

and distributed statistical and informative publications.

- 14th Joint Organizations Data Initiative Conference (JODI), Cairo, Egypt, 20-21 October 2019.
- Organized by the IEF in collaboration with organisations sponsoring the Joint Organizations Data Initiative (JODI) and the Egyptian Ministry of Petroleum and Mineral Resources.

6-4 JODI Gas Information Session, Malabo, Equatorial Guinea, 26 November 2019

The session was attended by Reps of the JODI initiative Partners, along with OAPEC in its capacity as JODI Associate.

OAPEC presented a paper at the opening session; and a technical paper on the importance of energy data transparency and quality to serve the UN sustainable development goals 2030 in another session.

7- ADMINISTRATIVE AND FINANCIAL ACTIVITIES

7-1 Evolution of the Administrative Structure

By the end of 2019 there were (37) employees working at the Secretariat General, (19) of whom were of the professional staff and (18) of the general staff.

7-2 Evolution of Actual Expenditure

Expenditure in 2019 totalled KD 1,733,005.

OAPEC JOINT VENTURES

- ARAB MARITIME PETROLEUM TRANSPORT COMPANY (AMPTC)
- THE ARAB SHIPBUILDING AND REPAIR YARD COMPANY (ASRY)
- THE ARAB PETROLEUM INVESTMENTS CORPORATION (APICORP)
- THE ARAB PETROLEUM SERVICESCOMPANY (APSCO)
- THE ARAB DRILLING AND WORKOVER COMPAN (ADWOC)
- THE ARAB WELL LOGGING COMPANY (AWLCO)
- THE ARAB GEOPHYSICAL EXPLORATION SERVICES COMPANY (AGESCO)
- THE ARAB DETERGENT CHEMICALS COMPANY (ARADET)
- ARAB PETROLEUM TRAINING INSTITUTE (APTI)

OAPEC Joint Ventures

The report observes the challenges and opportunities to access financial and banking services, and the funding in the Arab countries. The report exhibits the Arab and International developmental aid about $6.3 billion in 2011, in the framework of highlighting the importance of the joint Arab economic cooperation. The report includes a chapter on Arab cooperation in the area of anti-desertification. In conclusion the report comprises a chapter on the Palestinian economy.

OAPEC joint ventures put great efforts into boosting their activities and presence depending on their own potentials and resources, in addition to member countries' support. Some joint ventures are facing difficult conditions due to the security situation in their areas of operation, the oil market developments due to declining oil prices, as well as, strong competition from giant companies. This is in addition to difficulties to enter some Arab markets due to administrative and regulatory measures. They hope for more support from the member countries especially in terms of entering Arab markets on a competitive basis, if not preference.

The Secretariat General plays a coordinative role between these joint ventures by organising an annual official meeting to discuss means for boosting cooperation and to review common challenges in light of the Arab and international developments.

Summary of OAPEC Joint Ventures' Activities

ARAB MARITIME PETROLEUM TRANSPORT COMPANY (AMPTC)

AMPTC
Arab Maritime Petroleum Transport Company

Arab Maritime Petroleum Transport Company (AMPTC) was established on 6 May 1972, with an authorized capital of $500 million, and paid-up capital of $450 million. The company is situated in the State of Kuwait. All OAPEC members, with the exception of Syria, have stakes in the company.

- **AMPTC Activities in 2018 & First Half of 2019**

During 2018, the company's plan on upgrading and diversifying its fleet units has completed. It built 6 clean petroleum products tankers (with tonnage of 157 thousand tons each). All AMPTC tankers are accredited by all international petroleum companies and have been chartered on the basis of "spot voyage" by major oil companies like Shell, BP, Total, etc.

During the first half of 2019, chartering prices recovered noticeably, which reflected positively on the company's fleet operational results (from spot voyage system in petroleum shipping markets). Unlike the situation back in 2018, the operation posted profits.

As for LNG trade activities, the

company has posted good profits over the past years surpassing profits from its basic activity that is shipping. However, during 2018 the company did achieve its target results in this activity due to decline in some petroleum authorities and institutions' imports in the Arab region.

In pursuant to the company's policy in collaboration with Arab companies, especially from the shareholding countries, commercial partnership with Iraqi Oil Tankers Company (IOTC) have continued through the reconstruction of the latter and the establishment of a joint venture registered in the UAE with the name "Al Iraqia Shipping Services & Oil Trading".

- **AMPTC Financial Results for the Financial Year 2019**

The company's revenues amounted to about $87.138 million, and the actual operating expenses, before tanker depreciation, stood at $57.504 million. Book depreciation of tankers amounted to nearly $15.239 million.

After calculating gas activities, administrative, general and other expenses, the net profit posted by the company in the first half of 2019 amounted to about $26.308 million.

- **Training**

The company seeks to upgrade its staff by training according to their needs. Two employees were delegated on training courses in 2018 and one in the first half of 2019. Also, training courses have been organised in Cairo during 2018 and the first half of 2019.

- **Staffing**

By the end of 2018, the company had 82 employees, including 47 Arabs. The fleet had 300 officers and engineers, including 198 Arabs.

In mid-2019, it had 82 employees, including 48 Arabs. The fleet had 302 officers and engineers, including 198 Arabs.

The Arab Shipbuilding and Repair Yard COMPANY (ASRY)

Established on 8 December 1973, Arab Shipbuilding and Repair Yard Company (ASRY) has an authorized capital of $340 million, issued and paid-up capital of $170 million. The company is located in Manama, Kingdom of Bahrain, and all OAPEC member countries, with the exception of Algeria, Syria and Egypt, have stakes in the company.

The Company's capital is $170 million. Its paid-capital is $53 million. The Company's Extraordinary General Assembly agreed during its Extraordinary Meeting to reduce the Company's capital from $170 million to $2 million, then to increase it to $53 million through Bahrain's Mumtalakat Holding's injection of $51 million in the Company by issuing 1,020,000 shares worth $50 each. Current Company shares stand at 1,060,000 shares ($50/share= $53 million) following the reduction and increase of its capital.

- **ASRY's Activities in 2018 and First Half of 2019**

2018 has been a challenging year for ASRY. It was obvious the company has been facing severe financial challenge due to various reasons, including volatile market conditions, aggressive regional competition, fluctuating oil prices, customer-restricting budget, as well as, heavy shortage in financial liquidity and the postponement of some important projects until 2019 as a result.

In terms of operations and revenues, the company posted total revenues of $169 million, compared to $161 million in 2017. The $8 million increase is a result of executing a new roadmap that led to improving the company's conditions and improvement of oil prices.

Revenues were mainly generated from services provided by the company to about 142 ships in 2018 at a repair rate of about $612,882/ship, in addition to repairing 14 rigs at an average cost of $8.4 million/rig.

In the first half of 2019, the total number of repaired ships was 80 at an average value of $486,130/ ship. In terms of rigs, the company repaired 4 rigs at an average cost of $4.5 million/rig.

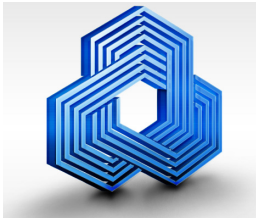
- **Financial Results 2018 & First Half of 2019**

According to unaudited financial statements of the year 2018, the company's final financial statements showed a net loss of about $ 27.7 million on 31 December 2018 compared to a loss of about $13.4 million on 31 December 2017. Net loss has increased by $14.3 million, or 107%, due to continued negative circumstances surrounding the company.

In the first half of 2019, sales stood at about $89 million compared to about $79 million for the same period in 2018. Total revenues for H1/2019 (before calculating interest, tax, consumption) were plus $2.9 million compared to minus $5.5 million for H1/2018.

- **Training & Staffing**
  - Human Resources and Training Department continued improving the talented group management. A total of 1,148 ASRY employees have been registered in training courses.
  - By 28 July 2019, the company had 1942 employees and workers, including 508 Bahrainis and Arabs while there were 1434 non-Arab employees.

THE Arab Petroleum InvestmenTS Corporation (APICORP)



The Arab Petroleum Investments Corporation (APICORP) was established on 14 September 1974. The company's headquarters is located in Dammam, Saudi Arabia. The company's authorized capital is $2.4 billion, and the subscribed capital by $2 billion. The company's paid capital is $1 billion.

- **Company activities in 2018 and First Half of 2019**

2018 marked a strong performance by APICORP. The corporation managed to maintain the growth of revenues, profits, and achieve added value for its shareholders. APICORP proved it was capable to overcome challenges facing the markets in the region. It also adapted to and managed changing conditions. It got AA credit rating.

Moreover, in 2018, APICORP completed the sale of its 29% equity investment in National Petroleum Services (NPS) to National Energy Services Reunited Corporation (NASDAQ: NESR). Good revenues were made from the sale process, as the value of the investment portfolio reached about $1.0 billion by the end of 2018. Income stood at $173.9 million.

By the end of 2018, Investments also acquired an equity stake in Yel-low Door Energy (YDE), a UAE-based solar power developer, alongside a consortium of leading international investors.

Creating and maintaining strategic investment partnerships continued to remain a priority for APICORP. It managed to reach out for the first time to Asian investors through Chinese renminbi with its debut dim sum bond worth $100 million; and American investors through bonds worth $750 million. APICORP also continued its investment activities with Goldman Sachs' West Street Capital Partners and deepened its involvement in the IFC MENA Fund.

Treasury and Capital Markets continued to successfully carry out its mandate to diversify APICORP's funding base and widen the range of its funding sources. They continued to optimise APICORP's debt tenors throughout the year, focusing on reliable, stable sources of funding and reducing the share of short-term deposits in APICORP's overall funding base. This latter development, the extension of the maturity profile of APICORP's debt, was the primary factor influencing Moody's decision to recently upgrade APICORP's rating outlook from Stable to Positive. (GOOD TO ADD)

APICORP's companies' funding activity has exceeded the scheduled goals in 2018. Loans portfolio is now worth $3.49 billion compared to $2.96 billion in 2017.

In terms of trade finance, 2018 has been a transitional year for APICORP's Letter of Credit (LC) Desk activities that support a wide range of clients including international retailers and national oil and gas entities like ARAMCO, BAPCO

and EGPC. LCs activity in 2018 amounted to a total value of $343 million compared to $291 million in 2017.

APICORP's Corporate Finance posted net income of $71.6 million compared to $39.4 million in 2017. New commitments reached $1.2 billion, exceeding budget by $300 million.

APICORP continued issuing US dollar-backed LCs in 2018 to boost its position in capital markets.

As for human resources, the corporation made success in attracting and recruiting 15 new employees in its various departments; 2 in the executive department. APICORP staff consist of 122 employees representing 20 nationalities, with 72% of them coming from member countries and other Arab countries. There are also staff coming from France, India, Pakistan, UK, Philippines, and South Africa.

Women quota has been observed in human resources. Women employees represent 11% of the total labour force in the corporation, 2 of which are part of the higher management.

- **Financial Results in 2018**

by 31 December 2018, net profit reached $182.27 million. Net profit before provisions came in at $207.97 million.

- **Financial Results for the First Half of 2019**

The net profit for the first six months of 2019 was $70.4 million.

THE ARAB PETROLEUM SERVICESCOMPANY (APSCO)

The Arab Petroleum Services Company (APSCO) is an Arab shareholding company established on 23 November 1975, located in Tripoli, Libya, under an agreement signed by the governments of OAPEC member countries, with an authorized capital of 100 million Libyan dinars (LD), and a subscribed capital of LD 60 million.

- **APSCO's Activities in 2018**

The company's activities focused throughout the year on helping specialised companies on credit collection to pay their debts. It supported these companies to find business opportunities inside and outside Libya in light of the current difficult conditions.

- **Financial Results on 31 December 2018**

APSCO's net loss for 2018 amounted to LD1,417,113.

الشركة العربية للخدمات البترولية
إحدى الشركات المنبثقة عن منظمة الأقطار العربية المصدرة للبترول

- **Company Activity during the First Half of 2019**

The company continued to monitor and support the three existing companies in light of current conditions, as well as, trying to overcome existing impediments.

- **Manpower**

On 30 June 2019, the company employed 8 staff members, all Arabs.

- **Financial Results for the First Half of 2019**

By 30 June 2019, APSCO's results were:

Total Income	LD 24,000
Total Expenditure	LD 665,000
Period Loss	LD 641,000

THE ARAB DRILLING AND WORKOVER COMPAN (ADWOC)

The company was established on 20 June 1979 and registered in Libya on 20 February 1980. The company's headquarters is in Tripoli, Libya. Its authorized capital is LD60 million, and its paid-up capital is LD60 million.

- **Company Activities in 2018**

During 2018, the company manged to put 5 rigs on operation: 2 drilling rigs and 3 workover rigs at 100% operation capacity. Work time was 36,894 hours and workover time was 423.5 hours compared at a rate of 1.15% as time spent on maintenance and workover; a far lower percentage than allowed and paid which is 4%. This is an evidence of the company's high efficiency in terms of operating rigs which reflects positively on clients' perception of the company.

Recurrent attacks against the company's headquarters in Wadi Al Rabei' have been discussed by the Board of Directors that made a recommendation to the General Assembly to sell that venue and find an alternative location in Tripoli that is safer for the company and its staff. The General Assembly agreed to selling the current headquarters for LD25 million and buy a new one for LD19 million.

- **ADWOC Financial Results for 2018**

APSCO's net loss for 2018 amounted to LD12,162,363 compared to LD12,987,740 loss in 2017. Cash profits in 2018 were LD8,474,729 ($6,096,927). The company's profits resulting from operating rigs alone were LD6,517,076 ($4,488,544).

- **Company Activity during Q1 of 2019**

As a result of ongoing events and armed conflict around Tripoli, the company's headquarters in Wadi Al Rabei' has been under fire. All staff were kicked out. The headquarters has been fully evacuated. No one was able to enter the company's headquarters which resulted the Financial Department's delay in finalising Q2 of 2019.

During Q1 of 2019, the company posted profits worth LD 328,163 compared to losses of LD 3,632,630 for the same period in 2018. Cash profits were LD 5,078,905 ($3,658,626). Hence, the company has moved from losses that started in 2014 to making profit in 2019.

- **Human Resources**

The company is still suffering from a dire shortage in skilled and unskilled labour. The company still awaits lifting ban on Egyptian and Philippines labour to enter Libya.

THE ARAB WELL LOGGING COMPANY (AWLCO)

One of the specialized subsidiaries of the Arab Petroleum Services Company (APSCO) AWLCO was established on 24 March 1983, with an authorised capital of $35 million and a fully paid-up capital of $35 million, and is based in Baghdad, Republic of Iraq. All OAPEC member countries have equal stakes in the company pro-rata their stakes in the Arab Petroleum Services Company (APSCO). The company specializes in well logging and perforation.

- **Company Activities during 2018 and H1 of 2019**

Work continued at North Operations Centre using open well logging and productivity appraisal, and other equipment.

- **Company Services**

The company continued its services in the various fields in Iraq through 3 operation centres. It renewed its equipment licensing through relevant channels. The company also updated its industrial safety booklet. Special tables on injuries and work scope have been prepared to be presented to licensing companies on a monthly basis for identifying the industrial safety types. The company provided training for its staff on safety and handling hazardous material.

AWLCO has also renewed licensing for radiant substances storage, ownership, transport, and import following their acquisition of ownership licenses at their warehouses in the North and South.

- **Company Financial Results for 2018 and the First Half of 2019**

1. In 2018, the company revenues were $4,935,335.00; and a net profit of $434,392.00.
2. The company's revenues for the H1/2019 were $2,504,441.00; and posted a net profit of $256,323.00.
3. Total revenues and profits for the period 1 January 2018 to 30 June 2019 are $7,439,576.00 and $690,715.00 respectively.

- **Human Resources & Training**

The company has 72 employees in its administrative and technical departments. It provided training to a number of its engineers and staff in various fields.

THE ARAB GEOPHYSICAL EXPLORATION SERVICES COMPANY (AGESCO)

AGESCO was established on 30 September 1984 in Tripoli, Libya. Its authorized capital is LD35 million and paid-up capital of LD35 million. APSCO has a stake of 66.66%, APICORP has a stake of 16.67%, and National Oil Corporation has a stake of 16.67% in AGESCO. The company's headquarters is in Tripoli, Libya. The company's headquarters is in Tripoli, Libya.

- **Company Activities in 2018 and H1/2019**

There were no any activities by the seismic teams in 2018. As for team 2, the company contacted Arabian Gulf Oil Company which in turn is still considering technical and financial offers to carry out mine survey in order to prepare for seismic surveys in block A57. A decision has yet to be made.

In Q3/2018, initial agreement has been reached with the Arabian Gulf Oil Company to execute a project in NC8A concession. Their representatives have visited the team's location. All necessary tests have been passed successfully, however, security incidents in Tripoli hindered launching the work. In Q4/2018, final agreement has been reached with the Arabian Gulf Oil Company to carry out a survey for a total area of 500 sq km.

As for H1/2019, there were no any seismic activities by the Second Seismic Team in Q1/2019, however, there are ongoing negotiations with OMV to carry out survey for a total area of 350 sq km in block C102 in Sirte Basin, which OMV plans to execute by the end of 2019.

As for team 3, seismic survey started in the Arabian Gulf Oil Company's NC8A concession on 15 January 2019. A total of 500 sq km has been surveyed. Project has been completed on 4 May 2019.

- **Financial Results for 2018**

Company revenues were $364,485, expenditure was $5,926,223. Net loss was $5,561,723.

- **Financial Results for the first half of 2019**

Company revenues were $6,205,985; expenditure $4,813,941. Net profit was $1,392,043.

- **Human Resources**

By end of 2018, staff were 76 employees representing members of management committee and employees. The number was 68 of management committee and employees that might be needed for launching any piece of work.

THE ARAB DETERGENT CHEMICALS COMPANY (ARADET)

The company was established on 12 March 1981 in Baghdad, Iraq, with an authorized capital of ID72 million and subscribed and fully paid-up capital of ID36 million.

- **Company Activities in 2018 & H1/2019**

As of the start of Q4/2018, the company launched a huge reconstruction campaign following financial allocations of about $800,000 assigned by the Board of Directors in phase 1 (1/10/2018-31/12/2018); and $6.5 million in phase 2 (throughout 2019) to be spent on rehabilitation. All taskforces managed to complete preparational activities including services facilities and infrastructure reconstruction. Achievement rates are on the rise to rehabilitate key equipment for production lines and production services units.

The company is currently working on the provision of the remaining basic requirements including pumps, compressors, backup equipment, and energy transport lines from the best suppliers. All repair work and restarting operations are expected to be completed by mid-2020.

- **The Company's Financial Results in 2018**

Due to continued halt of production and sales since mid-2014, the company's result continued to post losses that amounted to $14,379,000 in 2018 compared to 4,927,000 in 2017.

- **The Company's Financial Results in H1/2019**

During the period 1/1/2019 to 30/06/2019: operational losses amounted to $48,000 and final loss was $1,763,000.

Rehabilitation costs during H1/2019 reached $952,000 (covering equipment and assets procurement; tools; labour wages).

- **Manpower**

During 2018, the company had: 22 fulltime employees, 2 contracted employees; 5 part time employees; and 45 temporary and service employees in Baiji.

Part time staff number has risen in Baiji location during H1/2019 to over 80 temporary workers in various specialisations who contributed actively in the reconstruction of the company's industrial complex units.

Arab Petroleum Training Institute (APTI)

APTI was established in Baghdad, Iraq, in May 1978, to prepare instructors qualified to provide training in the many technical aspects of the oil industry, and to augment the administrative and technical personnel responsible for the different fields of the industry. The other objectives of APTI include performing research and conducting studies related to the modern techniques of industrial organization, and the methodology and techniques of training and education, as well as the creation of a central information and documentation system.

The institute does not have a fixed capital. It is funded on a yearly basis. All member countries contribute to the institute.

- **Institute Activities in 2018 and the first half of 2019**

Since its establishment, the institute went through quality development through its growing performance in spite of the circumstances that faced the host country. Achievements have risen during the period (2007-2014) compared to the institute's infant years. It executed 60 training courses for an average of 1200 trainees/annum compared to 16 training courses for 187 trainees/annum for previous years.

Between 2015-2019, training activities have dropped to 24 courses with 313 trainees/week/year.

The institute activities cover training; studies; research work; providing consultancy in all aspects; experts' secondment; seminars and conferences.

- **Financial Results**

Fiscal deficit has been recorded as follows: $599,550 in 2018; and about $251,000 in the first half of 2019.

- **Training Activities in 2018 and H1/2019**

Over 200 training programmes have been promoted as part of the institute's yearly plan for 2018. These programmes cover engineering; technical, administrative, financial, health and safety aspects, in addition to other fields whether inside or outside Iraq and for Iraqi and non-Iraqi organisations.

During H1/2019, it was agreed with a number of Iraqi oil companies to execute training courses. Some have been already completed while others await approval.

- **Organisational Structure**

The total staff number is 33 (all Iraqi nationals). The institute also has a network of 250 experts from Arab and non-Arab nationalities covering various technical, administrative, and economic fields, who are hired on temporary contract basis when needed.

- MAIN ENERGY INDICATORS
- UPSTREAM INDUSTRY
- DOWNSTREAM INDUSTRIES

MAIN ENERGY INDICATORS

- SUPPLY
- DEMAND
- INVENTORIES
- OIL PRICES

INTERNATIONAL OIL MARKET DEVELOPMENTS & THEIR IMPLICATIONS FOR OAPEC MEMBER COUNTRIES

- **Preface**

The world oil market was not immune against the developments in global economy during 2019, which went through various challenges including: world trade tensions especially between the USA and China; declining momentum in manufacturing to unprecedented levels since the global financial crisis in 2008; continued uncertainty over BREXIT; restrictions imposed on fiscal space in many major economies due to high debts; challenges facing emerging and developing economies; in addition to, escalating geopolitical tensions which significantly affected the oil market performance in general.

Global oil demand growth has fallen to its lowest in 8 years due to declining oil demand from developed countries for the first time since 2014 and continued slowdown of oil demand in other parts of the world. Global oil supplies have also declined generally; where a drop was registered in OPEC crude and unconventional oil supplies against a rise in non-OPEC supplies. This has coincided with new amendments to the OPEC+ agreement on cutting production coming into effect in the beginning of 2019. It was agreed to cut production by 1.2 million b/d until June 2019, which was then extended to until the end of March 2020. By the end of the year, OPEC+ countries have agreed to further cut about 0.5 million b/d. Overall, initial data on global crude supply and demand in 2019 show a deficit of 800 thousand b/d compared to a 300 thousand b/d surplus in 2018. Despite registering the strongest quarterly performance in Q1/2019 since 2009, global oil prices annual rate has dropped in 2019 compared to the previous year, the first decline since 2016. The decline is a result of various interconnected factors including slowdown in global economy performance and growing trade tensions between the USA and China which negatively reflected on future oil demand prospects.

- **Supplies**

In 2019, total global oil supplies (crude oil and NGLS) have dropped by about 100 thousand b/d (0.1%) compared to the previous year to reach 99 million b/d.

- **OPEC Supplies**

OPEC (crude oil and NGLS supplies) have dropped in 2019 by about 2 million b/d compared to the previous year to reach 34.7 million b/d. OPEC share of the world total supplies has dropped from 36.9% in 2018 to about 35.1% in 2019. It is worth noting that while OPEC crude supplies have dropped from about 31.9 million b/d in 2018 to about 29.9 b/d in 2019, OPEC NGLS and unconventional oil supplies have risen slightly by about 40 thousand b/d to reach about 4.8 million b/d in 2019. OPEC member countries spared no effort to maintain the global oil market balance and ensure good global economy performance, especially in light of global economic slowdown due to global trade tensions, which could have potential impacts on global oil stock levels, the global oil market performance and the industry in general.

- **Non-OPEC Supplies**

Non- OPEC countries' total oil supplies in 2019 have reached about 64.3 million b/d with an increase of about 1.9 million b/d, or 3% compared to 2018. The source of the greatest part of the increase was the growth of North America's output in general, especially the Unites States' shale oil and unconventional NGLs. The US production went up by about 1.7 million b/d to reach 18.4 million b/d in 2019, representing 89.5% of the total rise in non-OPEC oil supplies during 2019.

- **Global Oil Demand**

Global oil demand has increased in 2019 by 0.9 million b/d with a 0.9% growth rate, lower by 0.6% compared to the previous year. Developed countries' oil demand have dropped in 2019, for the first time since 2014, registering a decline of 0.04% compared to a 0.8% growth in 2018. The rest of the world has witnessed a slowdown in oil demand growth, registering a growth of 1.9% in 2019 compared to 2% growth rate in 2018, due to declining economic growth that has contributed in turn in the slowdown of global economy performance in general. It registered the lowest growth rate in the past decade. Generally, global growth rates have influenced global oil demand rates that have risen by only 0.9 million b/d in 2019, or 0.9% compared to over 2% growth rates in 2015 and 2016 and 1.5% in 2017 and 2018. Total global oil demand was 99.8 million b/d in 2019. According to key international groups, demand rates have dropped in the OECD during 2019 by about 20 thousand b/d to reach 48 million b/d. However, demand has risen in the rest of the world by one million b/d, compared to 2018 levels to reach 51.8 million b/d.

- **Crude Oil Prices**

World oil prices dropped significantly in 2019, following the highest rise in the previous year since 2015 and the first since 2016. Monthly OPEC basket rates fluctuated within a wide range (between $58.7 and $70.8 per barrel). Average annual OPEC basket rate reached $64 per barrel, with a drop of about $5.8

per barrel (equivalent to a drop of 8.3% compared to 2018 rates). In general, 2019 has witnessed discrepancies between the highest and lowest OPEC basket prices throughout the year of about $12.2 per barrel compared to the previous year's discrepancies of $22.5%.

Price developments and their discrepancies movement pattern throughout the year have reflected on spot prices of the various Arab crudes in general, which behaved in a similar way by dropping in varying degrees compared to the previous year. Arabian light crude has dropped by $5.6 per barrel reaching $65 per barrel in 2019. Algeria's Saharan Blend, UAE's Murban, and Kuwait export crudes have dropped by $6.9, $7.5, and $4.6 per barrel to reach $64.5, $64.7 and $64.3 per barrel respectively. Other Arabian crudes have also dropped: Libya's Sidra by $6 per barrel to reach $63.8 per barrel; Iraq's Basra by $5 per barrel to reach $63.6 per barrel; and Qatar Marine Crude Oil by $4 per barrel to reach $65.2 per barrel throughout the year.

- **Oil Products Spot Prices**

The crude oil prices decline has influenced the annual average price of various oil products in 2019, which in turn witnessed a drop in all major markets around the world by varying degrees according to market and product type. Gasoline price rate in the US Gulf market registered $79.7 per barrel in 2019; $71.4 per barrel in the Mediterranean market; $79.6 per barrel in Rotterdam market; and $72.5 per barrel in Singapore.

When comparing final price in some major industrial countries, it shows that gasoline price is cheapest in the US market due to low taxation in that market. Such taxes represented about 18.5% of the gasoline net price compared to 39.4% in Canada, 45.9% in Japan, 53.8% in Spain,

62.5% in France and 63% or more in some other European countries (Germany and the UK 62.9%, and Italy 64.3%).

Gasoil average annual price in 2019 has dropped in general in all major markets compared to the previous year. In 2019, Rotterdam accounted for the highest gas oil prices of $79.5 per barrel, followed by the Mediterranean ($79.1 per barrel); Singapore ($77.8 per barrel), the US Gulf with the lowest price of $74.6 per barrel. Fuel oil average prices have dropped in all markets in 2019: Singapore market ($57.3 per barrel); Mediterranean ($63.4 per barrel); Rotterdam ($60.2 per barrel); and the US Gulf market ($52.6 per barrel).

- **Oil Freight Rates**

In 2019, average freight price rate for oil shipments from Arabian Gulf ports to the East via VLCCs (230,000-280,000 dead weight tons (dwt)) was about 66 points on the World Scale (WS). An increase has also been registered in average freight price rates for shipments from Arabian Gulf ports to the West, with a capacity of 270,000-285,000 dwt, averaging 35 points on the WS, in 2019. In the Mediterranean region, freight rates for small and medium-sized tankers (80,000-85,000 dwt) registered 117 WS points in 2019.

- **Various Oil Inventories**

The year 2019 witnessed an increase in total world oil inventories (commercial and strategic) by the end of Q4/2019 reaching 8950 million barrels. Crude oil stocks at sea totaled 1154 million barrels by the end of 2019. Commercial inventories in OECD countries reached 2904 million barrels by the end of Q4/2019. It is worth noting that OECD commercial inventories level of forward consumption has reached a level of 61 days. The US Strategic Petroleum Reserve (SPR) has declined to 635 million barrels in Q4/2019. Since 2004, the US Administration has adopted a more flexible attitude towards releasing quantities of the SPR to compensate for any shortage of supply. This gave a more commercial aspect to the strategic reserve than previous policies, which regarded the SPR as a last resort to be used only at times of major crises.

- **Value of OAPEC Members Countries' Oil Exports**

Oil price rates in 2019 were reflected on the value of oil exports that are the main engine for social and economic development in the Arab oil producing countries. They are the mainstay for their central banks' foreign currency reserves, and the main source for their budget surplus. It is worth noting that OAPEC members' crude oil exports value has fallen by 8.3% from $442.5 billion in 2018 to $415.2 billion in 2019, representing a drop of about $27.3 billion (6.2%). The value of crude oil exports for member countries measured by real prices for the year 2005, after being adjusted according to the GDP deflator in OECD countries, has declined from $368.2 billion in 2018 to $340.3 billion in 2019, representing a drop of 7.6%.

Developments in Oil & Energy Consumption in OAPEC Members

Total Energy Consumption

Change in energy consumption is affected by three main variables; GDP,

population, and energy price changes in domestic markets of OAPEC member countries.

- **Energy Consumption by Source**

Energy consumption has risen in the member countries in 2019 at a rate of 3.4% to reach 13.5 million boe/d in 2019. OAPEC member countries energy consumption depended almost entirely on hydrocarbon resources (oil and natural gas) that accounted for 98.7% of their total energy consumption in 2019. Natural gas tops the consumption list in 2019 with meeting 53.6% of their energy needs in 2019; followed by oil (45.2%); then coal and hydropower with 0.6% each. The average per capita energy consumption in the member countries has fallen from 18.5 boe/d in 2015 to 17.8 boe/d in 2019.

OAPEC members are accounted for 4.7% of the world's total energy consumption; OECD countries (40.9%); developing countries (47.7%); and Former Soviet Union (FSU) countries (6.7%).

Natural gas consumption has risen in OAPEC member countries by 3.5% to about 7.2 million boe/d in 2019. OAPEC member countries generally consume 10.6% of the world's total natural gas currently. OECD countries are accounted for 45.5% of the world's total natural gas consumption; followed by developing countries (28.8%); and FSU countries (15.1%).

2019 witnessed a rise in petroleum products consumption in OAPEC member countries at 3.3% to reach 6.1 million boe/d, with about 6.3% share of the world's total petroleum products consumption currently. OECD countries accounted for 47.3 of the world's total petroleum products consumption, developing countries (42.3%), and FSU countries (4.1%).

Hydroelectricity consumption has risen in OAPEC members from 82.1 thousand boe/d in 2015 to 83 thousand boe/d in 2019. Egypt is the biggest Arab producer and consumer of hydroelectricity. Generally, OAPEC countries accounted for about 0.4% of the world's total hydroelectricity consumption currently; developing countries consume 59.9%; OECD (33.9%), and FSU countries (5.8%).

Coal share has also risen in terms of the total energy consumption in the OAPEC member countries from 0.5% in 2015 to 0.6% in 2019. OAPEC countries accounted for about 0.1% of the world's total coal consumption currently; while developing countries accounted for 73.5%, the OECD countries for 22.8%, and the FSU countries for 3.6%.

- **Domestic Prices**

Five member countries resorted to amendments in petroleum products prices in their domestic markets in 2019; they are: UAE; KSA; Syria; Qatar; and Egypt.

Table 1-1

Total & Annual changes in World Oil and NGLs Supply, 2015-2019

(Million b/d)

	2015	2016	2017	2018	2019*
Total Supply					
OPEC **	37.7	40.2	38.7	36.6	34.7
Non-OPEC ***	58.2	56.4	57.7	62.5	64.3
World total	95.9	96.6	96.4	99.1	99.0
Annual Change					
OPEC	1.2	2.5	(1.5)	(2.1)	(2.0)
Non-OPEC	1.8	(1.8)	1.3	4.8	1.9
World total	3.0	0.7	(0.2)	2.7	(0.1)
Percentage Change (%)					
OPEC	3.3	6.6	(3.6)	(5.4)	(5.3)
Non-OPEC	3.2	(3.1)	2.3	8.3	3.0
World total	3.2	0.7	(0.2)	2.8	(0.1)

* Estimated data.
** Jan. 2016, the basket price includes the Indonesian crude. As of July 2016 the basket price includes the Gabonese crude, As of January 2017, the basket price excludes the Indonesian crude "Minas". As of June 2017,The basket price includes the Equatorial Guinean crude "Zafiro"". As of June 2018, the basket includes the Congolese crude "Djeno", As of January 2019: The basket price excludes the Qatari crude "Qatar Marine".
Notes:
- Parentheses denote negative figures.
Sources:
- OAPEC - Economics Department.
- OPEC, Monthly Oil Market Report (various issues).

Table 1-2

Amendments OPEC+ agreement and the additional adjustment

(Million b/d)

	Reference Production * level	Adjustment	January 2019	Additional adjustment effective as of 2020 January 1
OPEC	**26.749**	**(0.812)**	**25.937**	**(0.372)**
Algeria	1.057	(0.032)	1.025	(0.012)
Angola	1.528	(0.047)	1.481	_
Congo	0.325	(0.010)	0.315	(0.004)
Ecuador	0.524	(0.016)	0.508	_
Equatorial Guinea	0.127	(0.004)	0.123	(0.001)
Gabon	0.187	(0.006)	0.181	(0.002)
Iraq	4.653	(0.141)	4.512	(0.050)
Kuwait	2.809	(0.085)	2.724	(0.055)
Nigiria	1.738	(0.053)	1.685	(0.021)
Saudi Arabia	10.633	(0.322)	10.311	(0.167)
UAE	3.168	(0.096)	3.072	(0.060)
Non-OPEC	**18.320**	**(0.383)**	**17.937**	**(0.131)**
Azerbaijan	0.796	(0.020)	0.776	(0.007)
Bahrain	0.227	(0.005)	0.222	(0.002)
Brunei	0.131	(0.003)	0.128	(0.001)
Kazakhstan	1.900	(0.040)	1.860	(0.017)
Malaysia	0.627	(0.015)	0.612	(0.005)
Mexico	2.017	(0.040)	1.977	(0.018)
Oman	0.995	(0.025)	0.970	(0.009)
Russia	11.421	(0.230)	11.191	(0.070)
Sudan	0.074	(0.002)	0.072	(0.001)
South Sudan	0.132	(0.003)	0.129	(0.001)
Total OPEC+	**45.069**	**(1.195)**	**43.874**	**(0.503)**

* Reference production level is October 2018 for all OPEC+ Countries Exclude Kuwait, Azerbaijan and Kazakhstan.

Notes:

- The Agreement Excludes Libya, Iran and Venezuela.
- Reference production level is September 2018 for Kuwait and Azerbaijan.
- Reference production level is November 2018 for Kazakhstan.

Source: OPEC.

Table 1-3
Economic Growth and Oil Demand Growth by Region, 2015-2019
(%)

	2015	2016	2017	2018	2019*
OECD countries**					
GDP	2.3	1.7	2.5	2.2	1.7
Oil demand	1.5	1.5	1.1	0.8	(0.04)
Rest of the World***					
GDP	4.3	4.6	4.8	4.5	3.7
Oil demand	3.5	2.8	2.4	2.0	1.9
World total					
GDP	3.5	3.4	3.8	3.6	2.9
Oil demand	2.5	2.1	1.8	1.5	0.9

* Estimated data.
** Include the newly industrialized Asian countries are Hong Kong, South Korea, Singapore, and Taiwan in terms of GDP.
*** Include Emerging markets and developing economies in terms of GDP.
Note: Parentheses denote negative figures.
Sources:
- IMF, World Economic Outlook (various issues) .
- OAPEC - Economics Department.
- OPEC, Monthly Oil Market Report (various issues).

Table 1-4
Economic Growth by Region, 2015-2019
(%)

	2015	2016	2017	2018	2019*
OECD	2.3	1.7	2.5	2.2	1.7
Of which: Euro Area	2.1	1.9	2.5	1.9	1.2
Japan	1.2	0.6	1.9	0.3	1.0
USA	2.9	1.6	2.4	2.9	2.3
Non OECD	4.3	4.6	4.8	4.5	3.7
Eastern and Central Europe	0.8	1.8	3.9	3.1	1.8
Of which: Russia	(2.3)	0.3	1.6	2.3	1.1
Asian developing countries**	6.8	6.7	6.6	6.4	5.6
Of which: China	6.9	6.7	6.8	6.6	6.1
India	8.0	8.2	7.2	6.8	4.8
Latin America and the Caribbean	0.3	(0.6)	1.2	1.1	0.1
Of which: Brazil	(3.6)	(3.3)	1.1	1.3	1.2
Mexico	3.3	2.9	2.1	2.1	0.0
Middle East and North Africa	2.6	5.0	2.3	1.9	0.8
Sub-Saharan African countries	3.1	1.4	3.0	3.2	3.3
World	**3.5**	**3.4**	**3.8**	**3.6**	**2.9**

* Estimated data.
** Excludes Pakistan and Afghanistan.
Note: Parentheses denote negative figures.
Source:
- IMF, World Economic Outlook, January 2020.

Table 1-5
Total & Annual Change in World Oil Demand, 2015-2019
(Million b/d)

	2015	2016	2017	2018	2019*
World total demand	93.7	95.7	97.4	98.8	99.8
Annual Change in World Oil Demand (Million b/d)	2.3	2.0	1.7	1.4	0.9
Change (%)	2.5	2.1	1.8	1.5	0.9

* Estimated data.
Sources:
- IEA, Oil Market Report (various issues).
- OAPEC - Economics Department.
- OPEC, Monthly Oil Market Report (various issues).

Table 1-6
World Oil Demand by Region, 2015-2019
(Million b/d)

	2015	2016	2017	2018	2019*
OECD countries	46.4	47.1	47.6	48.0	48.0
Rest of the World**	47.3	48.6	49.8	50.8	51.8
World total	**93.7**	**95.7**	**97.4**	**98.8**	**99.8**

* Estimated data.
** Includes all of the developing countries and transition countries.
Sources:
- IEA, Oil Market Report (various issues).
- OAPEC - Economics Department.
- OPEC, Monthly Oil Market Report (various issues).

Table 1-7

Total & Annual Change in Oil Demand in OECD Countries, 2015-2019

(Million b/d)

	2015	2016	2017	2018	2019*
Americas	24.6	24.9	25.1	25.6	25.7
Europe	13.8	14.0	14.4	14.3	14.3
Asia Pacific	8.0	8.1	8.2	8.1	8.0
Total OECD	**46.4**	**47.1**	**47.6**	**48.0**	**48.0**
Annual Change in demand	**0.7**	**0.7**	**0.5**	**0.4**	**(0.02)**
Change (%)	**1.5**	**1.5**	**1.1**	**0.8**	**(0.04)**

* Estimated data.
Note: Parentheses denote negative figures.
Sources:
- IEA, Oil Market Report (various issues).
- OAPEC - Economics Department.
- OPEC, Monthly Oil Market Report (various issues).

Table 1-8

Total & Annual Change in Rest of the World Oil Demand (Excluding countries that joined the OECD), 2015-2019

(Million b/d)

	2015	2016	2017	2018	2019*
Developing countries	42.0	43.2	44.4	45.4	46.2
Arab countries	7.0	7.0	7.1	6.9	7.1
Of which: Member countries	6.0	6.0	6.1	5.9	6.1
Other Arab countries	1.0	1.0	1.0	1.0	1.0
Other countries in the Middle East and Africa	5.0	5.1	5.3	5.5	5.5
Total Middle East and Africa	12.0	12.1	12.4	12.5	12.6
Asian developing countries	23.5	24.7	25.6	26.4	27.0
Of which: China	11.2	11.8	12.3	12.7	13.1
India	4.1	4.4	4.5	4.7	4.9
Other countries	8.2	8.5	8.7	8.9	9.1
Latin America	6.6	6.5	6.5	6.5	6.6
Countries in transition (CIS)	5.3	5.3	5.4	5.5	5.6
Of which: Russia	4.6	4.6	4.7	4.8	4.8
Total Rest of the World	**47.3**	**48.6**	**49.8**	**50.8**	**51.8**
Annual Change in demand of Rest of the World	1.6	1.3	1.2	1.0	1.0
Change (%)	3.5	2.8	2.4	2.0	1.9

* Estimated data.

Sources:

- OAPEC - Economics Department.
- OPEC, Monthly Oil Market Report (various issues).

Table 1-9
Spot Price of OPEC Basket of Crudes, 2015 -2019
($/barrel)

	2015	2016	2017	2018	2019
January	44.4	26.5	52.4	66.9	58.7
February	54.1	28.7	53.4	63.5	63.8
March	52.5	34.7	50.3	63.8	66.4
April	57.3	37.9	51.4	68.4	70.8
May	62.2	43.2	49.2	74.1	70.0
June	60.2	45.8	45.2	73.2	62.9
July	54.2	42.7	46.9	73.3	64.7
August	45.5	43.1	49.6	72.3	59.6
September	44.8	42.9	53.4	77.2	62.4
October	45.0	47.9	55.5	79.4	59.9
November	40.5	43.2	60.7	65.3	62.9
December	33.6	51.7	62.1	56.9	66.5
First quarter	**50.3**	**30.0**	**52.0**	**64.7**	**63.0**
Second quarter	**59.9**	**42.3**	**48.6**	**71.9**	**67.9**
Third quarter	**48.2**	**42.9**	**50.0**	**74.2**	**62.2**
Fourth quarter	**39.7**	**47.6**	**59.4**	**67.2**	**63.1**
Annual average	**49.5**	**40.8**	**52.4**	**69.8**	**64.0**

Sources:
- OAPEC - Economics Department.
- OPEC, Monthly Oil Market Report (various issues).

Table 1-10
Average Spot Prices of OPEC Basket,Brent,WTI and Selected Arab Crudes, 2015-2019
($/barrel)

Crudes	2015	2016	2017	2018	2019	The Change in 2019
OPEC Basket	49.5	40.8	52.4	69.8	64.0	(5.8)
Of which:						
Algeria - Saharan Blend	52.8	44.2	54.2	71.4	64.5	(6.9)
Arabian Light	49.9	40.9	52.7	70.6	65.0	(5.6)
UAE- Murban	53.9	44.8	54.9	72.2	64.7	(7.5)
Kuwait - Export	48.2	39.2	51.7	68.9	64.3	(4.6)
Libya - Es Sider	51.4	42.6	52.9	69.8	63.8	(6.0)
Iraq-Basrah	47.9	39.4	51.9	68.6	63.6	(5.0)
Other crudes						
UAE - Dubai	51.0	41.3	53.2	69.7	63.5	(6.2)
Qatar-Marine*	50.7	41.4	52.9	69.2	65.2	(4.0)
Brent	52.4	43.7	54.2	71.2	64.2	(7.0)
WTI	**48.7**	**43.2**	**50.9**	**65.2**	**57.0**	**(8.2)**

* Qatar has suspended its membership in OPEC, as of January 2019.
Sources:
- OAPEC - Economics Department.
- OPEC, Monthly Oil Market Report (various issues).

Table 1-11
Nominal and Real Prices of Crude Oil, 2015-2019
($/barrel)

	Nominal Price	Index* 100=2005	Real 2005 Prices
2005	50.6	100.0	50.6
2006	61.0	102.1	59.7
2007	69.1	104.4	66.2
2008	94.4	106.4	88.7
2009	61.0	107.2	56.9
2010	77.4	108.1	71.6
2011	107.5	109.6	98.1
2012	109.5	111.0	98.7
2013	105.9	112.4	94.2
2014	96.3	114.1	84.4
2015	49.5	115.5	42.9
2016	40.8	116.6	35.0
2017	52.4	118.3	44.3
2018	69.8	120.2	58.1
2019**	**64.0**	**122.0**	**52.5**

* The index represents the GDP Deflator of industrial countries as published by the IMF.
** Estimated data.
Sources:
-IMF, World Economic Outlook , October 2019.
- OAPEC - Economics Department.
- OPEC, Monthly Oil Market Report (various issues).

Table 1-12
Average Monthly Market Spot Prices of Petroleum Products, 2018-2019
($/barrel)

	Market	Premium Gasoline	Gasoil	Fuel Oil
Average 2018	Singapore	79.9	84.7	65.2
	Rotterdam	87.3	85.9	62.3
	Mediterranean	79.1	85.7	63.5
	US Gulf	85.8	81.0	58.9
Average 2019	Singapore	72.5	77.8	57.3
	Rotterdam	79.6	79.5	60.2
	Mediterranean	71.4	79.1	63.4
	US Gulf	79.7	74.6	52.6
First quarter 2019	Singapore	67.3	77.0	62.6
	Rotterdam	74.6	79.3	59.8
	Mediterranean	65.4	79.2	62.1
	US Gulf	73.2	74.3	60.2
Second quarter	Singapore	74.8	80.1	63.6
	Rotterdam	87.2	81.8	61.2
	Mediterranean	77.5	81.1	64.5
	US Gulf	87.5	76.2	60.2
Third quarter	Singapore	72.7	77.1	60.6
	Rotterdam	79.1	77.9	58.8
	Mediterranean	72.0	77.7	62.1
	US Gulf	82.0	73.8	50.7
Fourth quarter	Singapore	75.0	76.9	42.4
	Rotterdam	77.3	79.0	60.8
	Mediterranean	70.5	78.2	64.9
	US Gulf	76.0	74.2	39.1

Source:
- OPEC, Monthly Oil Market Report (various issues).

Table 1-13
Share of Tax in Gasoline Prices in some OECD countries, 2018-2019
($/barrel)

	October 2018				October 2019			
	Price without Tax	Tax	End-User Price	Tax (%)	Price without Tax	Tax	End-User Price	Tax (%)
Canada	0.69	0.31	0.996	30.82	0.60	0.39	0.982	39.41
France	0.70	1.09	1.789	61.04	0.62	1.04	1.665	62.52
Germany	0.72	1.03	1.750	58.91	0.57	0.97	1.544	62.89
Italy	0.72	1.18	1.903	62.01	0.62	1.12	1.739	64.29
Japan	0.80	0.60	1.404	43.02	0.73	0.62	1.350	45.93
Spain	0.75	0.80	1.546	51.62	0.66	0.77	1.434	53.77
United Kingdom	0.66	1.04	1.699	61.09	0.60	1.02	1.617	62.89
USA	0.63	0.12	0.756	16.40	0.56	0.13	0.686	18.51

Source:
- IEA, Oil Market Report (various issues).

Table 1-14
Spot Tanker Freight Rates, 2018-2019
(World scale)

	Arabian Gulf - East *	Arabian Gulf - West **	Mediterranean - Mediterranean ***
Average 2018	**57**	**25**	**115**
January 2018	44	21	98
February	39	19	96
March	40	19	87
April	41	20	80
May	44	19	110
June	51	22	93
July	49	19	111
August	54	24	115
September	55	22	107
October	83	33	129
November	93	41	155
December	87	38	195
Average 2019	**66**	**35**	**117**
January 2019	56	24	131
February	52	26	95
March	60	30	95
April	40	21	80
May	39	19	103
June	44	20	89
July	44	20	88
August	57	27	76
September	62	30	110
October	135	83	176
November	92	56	156
December	113	63	199

* Vessels of 230-280 dwt.
** Vessels of 270-285 dwt.
*** Vessels of 80-85 dwt.
Source:
- OPEC, Monthly Oil Market Report (various issues).

Table 1-15
OECD Oil Inventories at Quarter End, 2018 & 2019
(million barrel)

	First quarter		Second quarter		Third quarter		Fourth quarter	
	2018	2019	2018	2019	2018	2019	2018	2019*
Americas	1466	1509	1470	1561	1541	1558	1544	1535
Of which: USA	1186	1229	1207	1307	1249	1297	1242	1267
Europe	969	979	958	981	936	979	929	985
Asia	378	380	388	388	389	399	400	384
Total OECD	2813	2868	2816	2930	2866	2936	2873	2904
Rest of the World	2756	2910	2729	3049	2791	2977	2913	3069
Total Commercial**	5569	5778	5545	5979	5657	5913	5786	5973
Oil at sea	1183	1160	1161	1142	1188	1159	1205	1154
Strategic :	1855	1832	1850	1830	1846	1827	1829	1823
US Strategic Petroleum Reserves	665	649	660	645	660	645	649	635
Tota World Inventories	**8607**	**8770**	**8556**	**8951**	**8690**	**8899**	**8820**	**8950**
OECD Commercial (days supply)	**55.9**	**60.7**	**58.8**	**60.2**	**59.3**	**61.2**	**59.5**	**61.0**

* Estimated data.
** Excludes Oil at sea.
Sources:
- Oil Market Intelligence (various issues).

Table 1-16
Value of Oil Exports in OAPEC Member Countries, 2015-2019
($ Million)

	2015	2016	2017	2018	2019*
Algeria	13912	11812	12755	15901	13494
Bahrain	3061	2518	3219	4239	3881
Egypt	2155	1774	2280	3021	2782
Iraq ***	43047	28095	46513	72924	78527
Kuwait	43274	37008	43946	59106	53793
Libya	3581	2813	11686	18504	20343
Qatar	7938	6199	6658	8644	7963
Saudi Arabia	152910	136195	170241	194358	174460
Syria	**	**	**	**	**
Tunisia	**	**	**	**	**
UAE	50055	43087	48987	65815	59952
Total	**319933**	**269501**	**346286**	**442512**	**415195**

* Estimated data.
** Preliminary data indicate that oil consumption exceeds oil production.
*** Official sources.
Sources:
- OAPEC - Economics Department.
- OPEC, Monthly Oil Market Report (various issues).

Table 1-17
Value of OAPEC Oil Exports in Current and Real Prices, 2015-2019
($ Billion)

Year	At Current Prices	Expressed in Real 2005 Prices
2005	305.8	305.8
2006	375.1	367.4
2007	410.2	392.8
2008	585.3	550.0
2009	352.8	329.1
2010	450.9	417.0
2011	624.8	570.1
2012	702.6	633.1
2013	654.3	582.0
2014	592.9	519.8
2015	319.9	277.0
2016	269.5	231.1
2017	346.3	292.8
2018	442.5	368.2
2019*	415.2	340.4

* Estimated data.
Note: Real revenues are obtained by deflating current prices by the GDP Deflator of industrial countries as published by the IMF.
Source:
- OAPEC - Economics Department.

Table 1-18
Energy Consumption in the Arab Countries, 2015-2019
(Thousand boe/d)

	2015	2016	2017	2018	2019*	Growth Rate (2015-2019)
Natural gas						
Member countries	6550.6	6660.6	6569.6	6991.8	7240.0	2.5
Other Arab countries	460.2	488.6	457.5	495.9	507.0	2.5
Total Arab countries	7010.8	7149.2	7027.1	7487.6	7747.0	2.5
Petroleum products						
Member countries	6015.7	5997.1	6052.9	5906.9	6100.0	0.3
Other Arab countries	1063.6	1087.6	1091.3	1111.8	1130.0	1.5
Total Arab countries	**7079.3**	**7084.8**	**7144.1**	**7018.7**	**7230.0**	**0.5**
Hydroelectricity						
Member countries	82.1	84.8	78.9	83.6	83.0	0.3
Other Arab countries	29.2	26.8	26.7	29.0	30.0	0.7
Total Arab countries	**111.3**	**111.6**	**105.6**	**112.6**	**113.0**	**0.4**
Coal						
Member countries	66.0	78.5	62.2	85.9	87.0	7.1
Other Arab countries	99.9	99.6	101.5	122.2	123.0	5.3
Total Arab countries	165.9	178.1	163.7	208.2	210.0	
Total Energy						
Member countries	12714.5	12821.0	12763.5	13068.3	13510.0	1.5
Other Arab countries	1652.8	1702.6	1676.9	1758.9	1790.0	2.0
Total Arab countries	**14367.3**	**14523.6**	**14440.4**	**14827.2**	**15300.0**	**1.6**

* Estimated data.
Note : The total may not add up due to rounding.
Sources:
- OAPEC - Databank.

Table 1-19
Per Capita Energy Consumption in the Arab Countries, 2015 and 2019
(Boe/year)

	2015	2019*
Algeria	10.4	10.5
Bahrain	78.7	70.4
Egypt	7.2	7.2
Iraq	8.1	9.8
Kuwait	66.2	58.3
Libya	27.8	21.7
Qatar	144.6	136.6
Saudi Arabia	50.4	47.9
Syria	4.2	4.4
Tunisia	5.6	6.5
UAE	70.5	63.9
OAPEC member countries	18.5	17.8
Other Arab countries	4.4	4.4
Total Arab countries	**13.5**	**13.0**

* Estimated data.
Sources:
- OAPEC - Economics Department.

Table 1-20

Energy Consumption in OAPEC Member Countries, 2015-2019

(Thousand boe/d)

	2015	2016	2017	2018	2019*	Growth Rate (2019-2015)
Algeria	1142.3	1125.1	1153.5	1223.6	1284.0	3.0
Bahrain	295.5	293.4	294.4	298.9	304.0	0.7
Egypt	1757.7	1850.3	1910.3	1924.7	1978.0	3.0
Iraq	822.7	883.0	983.1	1065.7	1099.2	7.5
Kuwait	758.9	695.9	681.5	728.9	738.2	0.7-
Libya	474.8	404.9	386.5	390.5	390.0	4.8-
Qatar	965.9	996.3	915.9	966.2	1005.0	1.0
Saudi Arabia	4350.9	4350.7	4382.6	4382.7	4547.1	1.1
Syria	215.7	218.0	226.2	219.5	220.8	0.6
Tunisia	171.8	175.1	189.7	205.3	212.1	5.4
UAE	1758.2	1828.2	1639.6	1662.3	1731.6	0.4-
Total	**12714.5**	**12821.0**	**12763.5**	**13068.3**	**13510.0**	**1.5**

* Estimated data.
Note : The total may not add up due to rounding.
Sources:
- OAPEC - Databank.

Table 1-21

Energy Consumption in OAPEC Member Countries by Source, 2015-2019

(Thousand boe/d)

	2015	2016	2017	2018	2019*	Growth Rate (2015-2019)
Natural gas	6550.6	6660.6	6569.6	6991.8	7240.0	2.5
Petroleum products	6015.7	5997.1	6052.9	5906.9	6100.0	0.3
Hydroelectricity	82.1	84.8	78.9	83.6	83.0	0.3
Coal	66.0	78.5	62.2	85.9	87.0	7.1
Total energy	**12714.5**	**12821.0**	**12763.5**	**13068.3**	**13510.0**	**1.5**

* Estimated data.
Note : The total may not add up due to rounding.
Sources:
- OAPEC - Databank.

Table 1-22

Natural Gas Consumption in OAPEC Member Countries, 2015-2019

(Thousand boe/d)

	2015	2016	2017	2018	2019*	Growth Rate (2019-2015)
Algeria	707.8	706.3	734.0	790.4	830.0	4.1
Bahrain	265.0	262.4	262.8	266.1	270.0	0.5
Egypt	829.4	886.2	1005.0	1063.8	1110.0	7.6
Iraq	167.8	188.6	223.1	320.4	330.0	18.4
Kuwait	358.4	311.4	303.2	346.3	350.0	0.6-
Libya	254.2	187.9	169.6	165.9	165.0	10.2-
Qatar	738.2	748.0	660.8	706.5	740.0	0.1
Saudi Arabia	1800.0	1910.4	1981.8	2033.5	2100.0	3.9
Syria	74.5	66.7	58.6	62.0	60.0	5.3-
Tunisia	78.8	80.5	85.8	91.0	95.0	4.8
UAE	1276.6	1312.1	1084.8	1145.8	1190.0	1.7-
Total	**6550.6**	**6660.6**	**6569.6**	**6991.8**	**7240.0**	**2.5**

* Estimated data.
Note : The total may not add up due to rounding.
Sources:
- OAPEC - Databank.

Table 1-23

Petroleum Products' Consumption in OAPEC Member Countries, 2015-2019

(Thousand boe/d)

	2015	2016	2017	2018	2019*	Growth Rate (2019-2015)
Algeria	431.5	417.7	415.7	429.3	450.0	1.1
Bahrain	30.5	31.1	31.6	32.8	34.0	2.7
Egypt	843.6	868.5	811.3	743.9	750.0	2.9-
Iraq	643.3	679.1	750.1	731.2	755.0	4.1
Kuwait	396.9	380.0	375.1	379.4	385.0	0.8-
Libya	220.6	217.0	217.0	224.5	225.0	0.5
Qatar	227.7	248.3	255.1	259.7	265.0	3.9
Saudi Arabia	2548.2	2438.5	2398.8	2347.1	2445.0	1.0-
Syria	134.1	144.3	160.7	150.4	155.0	3.7
Tunisia	92.0	93.6	102.9	113.3	116.0	6.0
UAE	447.2	479.1	534.7	495.4	520.0	3.8
Total	**6015.7**	**5997.1**	**6052.9**	**5906.9**	**6100.0**	**0.3**

* Estimated data.
Note : The total may not add up due to rounding.
Sources:
- OAPEC - Databank.

Table 1-24

Hydroelectricity Consumption in OAPEC Member Countries, 2019-2015

(Thousand boe/d)

	2015	2016	2017	2018	2019*	Growth Rate (2019-2015)
Algeria	0.4	1.0	1.0	0.2	0.3	6.9-
Egypt	62.2	61.4	60.9	61.3	61.6	0.2-
Iraq	11.6	15.3	9.9	14.1	14.2	5.3
Syria	7.0	7.0	7.0	7.0	5.8	4.6-
Tunisia	1.0	1.0	1.0	1.0	1.1	2.4
Total	**82.1**	**85.8**	**79.8**	**83.6**	**83.0**	**0.3**

* Estimated data.
Sources:
- OAPEC - Databank.

Table 1-25

Coal Consumption in OAPEC Member Countries, 2015-2019

(Thousand boe/d)

	2015	2016	2017	2018	2019*	Growth Rate (2019-2015)
Algeria	2.7	1.0	3.7	3.7	3.7	8.5
Saudi Arabia	2.7	1.8	2.1	2.1	2.1	6.1-
Egypt	22.5	34.2	33.1	55.8	56.4	25.8
Kuwait	3.6	4.5	3.2	3.2	3.2	3.1-
Syria	0.0	0.0	0.0	0.0	0.0	100.0-
Tunisia	0.1	0.0	0.0	0.0	0.0	100.0-
UAE	34.4	37.0	20.1	21.1	21.6	11.0-
Total	**66.0**	**78.5**	**62.2**	**85.9**	**87.0**	**7.1**

* Estimated data.

Sources:

- OAPEC - Databank.

Table 1-26

Energy Intisity in OAPEC member Countries, 2015 and 2018

(Toe/$million GDP)

	2015	2018
Algeria	2.2	2.2
Bahrain	3.5	3.2
Egypt	2.6	2.5
Iraq	1.6	1.8
Kuwait	2.0	1.9
Libya	4.6	2.8
Qatar	2.1	2.0
Saudi Arabia	2.3	2.3
Syria	n.a	n.a
Tunisia	1.3	1.5
UAE	1.7	1.5
OAPEC member countries	**2.2**	**2.1**

* Estimated data.

Sources:

- OAPEC - Economics Department.

Table 1-27

Domestic Prices of Petroleum Products in Arab Countries, 2019

(Local currency/liter)

Country and Last Date for which Data is Available			Currency	Gasoline		Household	Gas oil/	LPG*
	Month	Year		Premium	Regular	Kerosene	Diesel	
Algeria	Jan.	2018	Dinar	41.62	38.95		23.06	103.20
Bahrain	Jan.	2018	Dinar	0.235	0.140	0.025	0.160	1.200
Egypt	Oct.	2019	Pound	8.75	6.50	6.75	6.75	65.0
Iraq	Jan.	2018	Dinar	850	450	150	450	5000
Jordan	Nov.	2019	Dinar	1.155	0.765	0.595	0.595	7.000
Kuwait	Sep.	2016	Dinar	0.165	0.085	0.095	0.095	0.750
Lebanon	Nov.	2019	Lira	1265	1235	765	860	18125
Libya	Nov.	2015	Dinar	0.150		0.090	0.090	1.500
Mauritania	July	2014	Ouguiya		401	384.6	384.6	3146
Morocco	Oct.	2019	Dirham	11.15			9.89	
Oman	Nov.	2019	Riyal	0.289	0.203		0.240	
palestine	Dec	2020	Shekels	6.700	6.060	4.990	4.990	61.00
Qatar	Nov.	2019	Riyal	1.90	1.70	0.80	2.00	15.00
Saudi Arabia	Oct.	2019	Riyal	2.05	1.50	0.64	0.47	
Sudan	Nov.	2016	Pound		6.170	4.887	4.110	75.000
Syria	June	2019	Lira	550	425	150.0	180.0	2500
Tunisia	Sept.	2018	Dinar	1.985	1.480	1.110	1.390	7.700
UAE	Nov.	2019	Dirham	2.200	2.020	0.800	2.610	60.00
Yemen	April	2019	Riyal		365		430	

* Estimated data.

Note : The total may not add up due to rounding.

Sources:

- OAPEC - Databank.

UPSTREAM INDUSTRY

- RESOURCES
- EXPLORATION
- RESERVES
- PRODUCTION

UPSTREAM INDUSTRY
RESOURCES, EXPLORATION, RESERVES, & PRODUCTION

I- OIL & GAS

1. Overview on Exploration & Production in Arab Countries and Worldwide

Various significant economic decisions on oil and gas have been made in 2019. On the Arab front, Abu Dhabi National Oil Company (ADNOC) announced awarding a contract to establish a number of artificial islands as part of phase 1 of developing the giant Ghasha sour gas concession, including various offshore fields like: Hail, Ghasha, Dalma, Nasr and Mubarraz. In the same vein, ADNOC announced in October 2019, the signing of Ghasha Concession Agreement with LUKOIL that was awarded 5% share; the first of its kind for a Russian oil and gas company in Abu Dhabi concessions.

Among other significant developments, Saudi Aramco and Total signed a Joint Venture (JV) Agreement to develop a network of fuel and retail services in Saudi Arabia. Although this decision is not under exploration and production, however, it implies KSA's orientation towards recovering highest possible value of its hydrocarbon resources.

In July 2019, Saudi Aramco has awarded 34 contracts for the engineering, procurement and construction of the Marjan and Berri increment programs. The company plans to boost the Marjan and Berri fields' crude oil and gas production capacity.

In spite of the optimism prevailing throughout 2019, oil price and supply and demand uncertainty casted its shadows on the industry, especially shale oil. It is projected that exploration and production investments will shrink by 4% in 2020; with a drop of 12% in shale oil investments, due to low oil prices.

In 2019, the UAE announced it brought on stream the Haliba oil field, on the south-east border of Abu Dhabi. Potential resources in three new fields: Al Hamra; Bu Tasah, and Bu Nekhailah following carrying out intensive exploration programmes.

In Bahrain, an MoU was signed with Total for collaboration on developing oil and gas exploration opportunities, exchange of expertise, and supplying the Kingdom with LNG. Also, further to a joint study conducted by Eni in 2016 and a Memorandum of Understanding signed between Eni and the National Oil and Gas Authority of the Kingdom of Bahrain in January 2019, an Exploration and Production Sharing Agreement (EPSA) has been signed between NOGA and Eni to pursue petroleum exploration and production activities in the Kingdom of Bahrain's Offshore Block 1.

Algeria started production from Touat Gas Project, Basin of Sbaa, with a production capacity of about 12.7 million cubic metres/day.

In Libya, second phase pilot operation tests started at Al Faregh oilfield, southern Benghazi.

In Egypt, BP started production from the second stage of Egypt's West Nile Delta development project (Giza and Fayoum fields).

Also, Eni announced starting oil production from southwestern Maliha concession, Western Sahara, at about 5000 b/d. Gas production has also started from Baltim South West at an average of

2.8 million cubic metres/day.

Egypt also announced awarding 7 blocks to a number of Egyptian and international companies through Egyptian General Petroleum Corporation and The Egyptian Natural Gas Holding Company (EGAS) bids. Total oil and gas exploration investment to be injected in the new areas is between $760-800 million at the minimum; with a pledge to drill at least 60 wells.

In Iraq, the regional government of the Kurdistan Region of Iraq (KRI) signed a contract with Pearl Petroleum to boost Khor Mor gas field production.

Genel Energy drilled an appraisal well that has been brought on stream at 2000 b/d on average, which raised Taq Taq field to 15000 b/d. Atrush Field's production reached 45 thousand b/d in Iraqi Kurdistan. The field's total production reached about 17 million barrels of oil since brought on stream in 2017.

In Saudi Arabia, Aramco signed two contracts within its endeavours to develop Marjan offshore field, northeast Al Jubail.

In Oman, an initial agreement has been signed with Total to be awarded an exploration license onshore block 12. Other agreements were also signed with Eni and BP Oman for gas exploration in block 77.

2- Exploration and Development Drilling:

The average number of operating rigs worldwide reached 2189 in 2019 against 2209 rigs in 2018. 44% of rigs were in the USA and 19% in the Middle East.

Drilling activities have contributed to making discoveries of 6.7 billion BOE worldwide in H1/2019, mostly in deep waters. Until Q3/2019, discoveries were about 7.7 billion BOE.

3. Oil and Natural Gas Reserves

3- 1 Oil Reserves:

Global oil reserve estimates have risen from 1248.1 bb in 2018 to 1267.4 bb in 2019; an average of about 1.6%. This means the world added 19.3 billion barrels to its reserves during this period. (OAPEC estimates do not cover unconventional oil reserves like tar sands and oil shale in Canada. They also exclude bitumen, heavy and extra heavy oils in Venezuela.)

Oil reserves estimates in OAPEC member countries have risen to over 710 billion barrels (56.1% of the world's total oil reserves) by the end of 2019 due to a rise in UAE's reserves estimates.

3-2 Natural Gas Reserves:

World natural gas reserves estimates have risen by 2.1% from 201.6 trillion cubic meters in 2018 to 205.9 trillion cubic meters in 2019. OAPEC members gas reserves estimates increased by 3.2% between 2010 and 2019.

4. Hydrocarbon Liquids and Natural Gas Production

4-1 Hydrocarbon Liquid Production

4-1-1 Crude Oil Production

Estimates show that world crude oil production have slightly increased by no more than 0.1%, from 87.25 million b/d in 2018 to 87.35 million b/d in 2019.

4-1-2 OAPEC Members and Other Arab Countries

Crude oil production estimates in OAPEC member countries have risen by about 0.4% from 23.78 million b/d in 2018, to 23.88 million b/d in 2019 (representing 27.3% of the world's total crude oil production in 2019). Arab countries'

combined production estimates were about 24.9 million b/d (representing 28.4% of the world's total production).

4-2 NGL Production

Estimates indicated a rise in the world's natural gas liquids production by only 0.6% hitting 10.9 million b/d in 2018, against 10.8 million b/d in 2017. Total NGL production in OAPEC member countries was estimated at about 4.3 million b/d in 2018 (equal to about 39% of the world's total output).

5 Marketed Natural Gas

The quantities of marketed natural gas worldwide have increased by 4.8% between 2017 and 2018, from 3664 billion cubic meters in 2017 to 3842 billion cubic meters in 2018. Changes in marketed natural gas quantities differed between OAPEC member countries; the quantities declined in Tunisia and Libya but increased in the rest of the member countries. Combined Arab countries marketed natural gas quantities have risen from 578.7 billion cubic metres in 2017, to 591 billion cubic metres in 2018. The quantities of marketed natural gas of OAPEC members and other Arab countries combined have registered 14.6% and 15.5% respectively of the world's total.

II- COAL

Reserves

Coal reserves estimates have risen by about 20 billion tons between 2017 and 2018, driven mainly by a hike in reserves in Indonesia, Australia and India.

Production

World coal production increased by 4.3% between 2017 and 2018, from 7704.4 million tons in 2017, to 8012.8 million tons in 2018.

III- NUCLEAR ENERGY

The number of operating nuclear power reactors worldwide reached 448 in 2017, 99 out of which based in the USA and representing about 22% of the world's total. Reactors number under construction is 59, 18 of which in China. The world's operating reactors design capacity reached more than 391 TW, and 60 TW for those under construction.

IV- RENEWABLE ENERGY RESOURCES

Renewables, given their low cost and continuous production technologies, provide all basic pillars for sustainable development whether environmental, economic, or social, as well as, creating many job opportunities.

4.1 Global Investments in Renewables

New global investments have registered about $ 288.9 billion in 2018 spent on energy production from renewables and biomass fuel (excluding hydropower- generated electricity projects with a capacity over 50 MW). This represents an 11% decline compared to 2017. The decline in new investments is attributed partially to the decline in power production costs from solar photovoltaic cells, as well as, slowdown in solar energy project growth in China.

New direct investments in renewables are expected to rise up to about $ 842 billion by 2030.

4.2 New Installed Renewables Capacities

Renewables production technologies have developed and improved, which

contributed to cutting production costs. Total installed renewable capacity has reached about 181 GW in 2018, which raised renewables capacities worldwide up to about 2378 GW compared to about 2195 GW in 2017.

For the fourth consecutive year, renewables have beaten fossil fuel and nuclear energy combined in more installed capacities for electricity generation. About 100 GW photovoltaic capacity has been installed, representing 55% of the new installed capacities, followed by wind (28%) and hydropower (11%). China has topped the world in terms of installed renewables capacities followed by the USA, Brazil, India, and Germany.

- 4.2.1 Hydropower

About 20 GW of new hydropower capacity have been installed, which makes total installed hydropower capacity about 1.32 GW. World top 10 list rankings are as follows: China, Brazil, Canada, USA, Russia, India, Norway, Turkey, Japan and France. Together, they represent 69% of the world's total installed hydropower capacity.

As is the case in past years, China has led the world in terms of newly added hydropower capacities. Their new projects (of over 1 GW) represent about 35% of the total new establishments, followed by Brazil, Pakistan, and Turkey. Other countries have also installed large production capacities like Angola, Tajikistan, Ecuador, India, Norway, and Canada.

- 4.2.2 Wind Energy

About 51.5 GW of wind capacity installed worldwide in 2018 (including nearly 47 GW onshore and 4.5 GW offshore). The additions in 2018 pushed cumulative capacity up 9% to 591 GW, with about 568.4 GW onshore wind turbines and the 22.6 GW offshore. African and the Middle Eastern countries witnessed a 50% increase from 2017, with most of the nearly 1 GW of new capacity coming online in Egypt (380 MW), Kenya (310 MW) and Morocco (120 MW) whose total installed cumulative capacity reached 1220 MW. Bahrain also installed capacity of about 178 MW increasing its total capacity to about 612 MW. Jordan installed capacity increased to 285 MW compared to 198 MW in 2017.

As for other Arab countries, there were no new additions in 2018, their cumulative capacities remained fixed: Kuwait (10 MW); Lebanon (3 MW); KSA (3 MW); Syria (1 MW); and UAE (1 MW).

- 4.2.3. Solar Energy (Photovoltaic)

Solar photovoltaic energy is the fastest growing capacity worldwide. Demand is growing as it has become the most competitive option for power generation in an increasing number of countries worldwide. 11 countries have added over 1 GW capacity in 2018 compared to only 9 countries in 2017 and 6 countries in 2016.

Installed photovoltaic capacity slightly increased in 2018 by about 100 GW, a meagre increase compared to about 98 GW in 2017. World total cumulative installed photovoltaic capacity in 2018 recorded about 505 GW, compared to only 15 GW in 2008.

MENA markets saw a significant progress in 2018, about 2.6 GW have been installed to reach a total cumulative capacity of about 6.7 GW. UAE added 0.6 GW as the country aims to generate electricity by 7% in 2020, 25% in 2030, and 75% in 2050 from renewable resources. Jordan installed 0.4 GW.

South Africa topped African countries

in 2018 in terms of installed photovoltaic capacity with about 1.8 GW; with about 60 MW of added new capacities. In terms of new added capacities, Egypt followed after inaugurating Benban Solar Park, which added about 0.5 GW. Morocco installed about 0.6 GW in 2018. A new solar project will be set up in Aswan. Morocco has installed about 0.6 GW of photovoltaic capacity in 2018.

- 4.2.4. Geothermal Energy

The total installed geothermal capacity in the world amounted by about 0.5 GW in 2018 to 13.3 GW. Total geothermal output reached about 630 PJ. Geothermal- generated electricity output registered about 89.3 TW/H, representing 50% of the total produced geothermal energy.

- 4.2.5. Biomass Energy

Global biomass capacity has risen by about 6.5% in 2018 to reach about 130 GW compared to 121 GW in 2017. Bioelectricity generation output has risen by 9% to 581 TW/H.

4.3 Renewables in the Arab World

Renewables cumulative installed capacity in the Arab countries recorded about 16591 MW by the end of 2018, with an increase of about 8% compared to 2017, and about 0.72% of the world's total. Total installed capacity in OAPEC member countries reached 10491 MW; and 6460 MW in Arab non-OAPEC members.

By the end of 2018, Egypt topped Arab countries in terms of renewables installed capacity with 4813 MW (28.39% of the Arab countries' total capacity); followed by Morocco with 2566 MW (15.14%); and Iraq with 2311 MW (13.63). The three countries account for 57% of the Arab world's total output.

Table 1:
Average Number of Active Rigs Worldwide, 2019-2015

	2015	2016	2017	2018	2019
Middle East	403	390	389	397	412
Africa	109	85	83	97	117
Europe	118	96	92	85	149
Asia/Pacific	223	187	199	218	229
USA	1026	510	870	1027	957
Canada	198	128	207	196	135
Latin America	327	198	184	189	190
World Total	2404	1594	2024	2209	2189

Baker Hughes, Jan. - Nov. 2019.

Table 2:
Technical indicators of 2019 discoveries

									Notes- Reserves- Tests		
Country	**Permit/ Prospect/ Field**	**Well**	**Type**	**Age**	**Water Depth (m)**	**Well Depth (m)**	**Gross Thickness (m)**	**Net Pay (m)**	**Oil**	**Gas**	**Condensate**
Algeria*	Tindouf	ERTA-1	Gas						* Algeria made **7** more discoveries in 2019, but no detailed data was made available	Test: 6600 m^3/d	Test: 42 b/d
Angola	Block 15/06	Agogo-1 NFW	Oil		1636	4450	203	120	In place: 450- 650 M bbls. Production Capacity: 20 K bpd (31° API)		
	Block 15/06	Ndungu-1 NFW	Oil	Oligocene	1076	4050		45	In place: 250 M bbls (35° API). Capacity 10K b/d		
Australia	AC/P54	Orchid-1	Gas		Offshore	2925		34			
	Corvus field	Corvus-2	Gas		63	3998	638	245		condensate-gas ratio: 10 bbl/MMcf	
	Perth basin	West Erregulla-2	Gas		Onshore	5200	74				
	North Perth basin	W Erregulla-2	Gas			5100	97	41			
	Otway basin	Annie-1	Gas		58		70				
	North Perth basin	B.S. Deep-1	Gas		Onshore	4170	65	36		Porosity 21%	
Brazil	block BM-SEAL-4	Moita Bonita-2	Gas		2629	5291	63				
Colombia	Middle Magdalena basin	Boranda-2 ST	Oil	Eoceno	300	4246			Test: 960 bpd		
	Llanos 34 block	Guaco 1	Oil			3638			Test: 960 b/d		
	block CPO-5	Sol-1	Oil			2852	8				
	Llanos 34	Guaco 1	Oil			3638			Test: 960 bpd (24.6° API)		
Congo	Delta de la Cuvette		Oil		Onshore				359 M bbl		
Cyprus	Block 10	Glaucus-1	Gas		2063	4200	133			Resources: 142- 227 B cum Recoverable resources: 700 M boe	
Egypt	Nour	Nour-1	Gas	Oligocene	295	5914	33				
	North El Arish	Merak-1								Non Commercial	
	West Gharib	Rabul-7	Oil	Lower Miocene		1622		41	Test: 415 b/d		
	Abu Rudies	Sidri 23	Oil					100	STOIP: 200 M bbls		
	Nile Delta	El Qar'a-NE1	Gas							Test: 481 K m^3/d	
Equatorial Guinea	Rio Muni Basin	S-5	Oil			4400		39	No data yet		
Ghana	DWT-CTP Vlock	Pecan South-1A	Oil		Offshore				gross contingent resources: 450- 550 M boe		
	West Cape three points Block 2	Afina-1	Oil		1030	4085	65	50	STOIIP: 1.5 B bbl Recoverable: 420 M bbl	20 B cum	
Guyana	Stabroek	Tilapia-1	Oil		1783	5726	93		Recoverable reserves: collectively with (Yellowtail disovery) almost 800 M boe		
	Stabroek	Haimara-1	Gas		1399	5575	63				
	Stabroek	Yellowtail-1	Oil		1848	5622	89				
	Orinduik license	Jethro-1	Oil	Lower Tertiary	1350	4400		55	Expected: 100 M bbls		
	Guyana basin	Joe-	Oil	Upper Tertiary	750	2157		16	Heavy oil, high sulfur content		
India	GK-OSN-2009/1 Kutch	GKS091NFA-1	Gas		Offshore						
	NWMH Extn. PML	B-203-2	Oil		Offshore				Test: 783 bpd	Test: 78,571 cu m/d	
	KG-OSN-2009/3	H2	Oil	Mesozoic		4026		28			
Indonesia	Sakakemang Block	Kali Berau Dalam-2	Gas	Pre-Tertiary	Onshore					Recovarable: 56 B cum	
	Sakakemang	Kali Berau Dalam-2	Gas	Pre-Tertiary	Onshore					Test: 1.3 M cum /d	
Iran	Eram field		Gas							Recoverable: 368 B cu m	
	Namavaran		Oil				80		STOIIP: 22 B bbls Recoverable: 2.2 B bbls		

Iraq	Baeshiqa block	Baeshiqa-2	Oil	Triassic		3204					
Malaysia	Central Luconia	Lang Lebah-1RDL2	Gas			3810	252		Resources: 57- 71 B cum	Test: 1.2 cum/d	Test: 246 b/d
Mauritania	Albian play	Orca-1	Gas	Cenomanian	2510	5266		36		GIIP 368 B cum	
Mexico	Quesqui field	Quesqui 1	Oil						3P reserves: 536 B bbls		
Nigeria	Obiafu field	Obiafu-41	Gas	Oligocene	Onshore	4373	130			Expected reserves: 305 B cum	60 M bbls
Norway	Telesto	34/8-18 S	Oil	Late Triassic	335	3298	115	37	In place: 12- 28 M bbls		
	Froskelår Main prospect	24/9-14S	Oil	Paleocene	120	2097	68	38	Gross: 60- 130 M boe		
	Alvheim area	24/9-14 S	Oil+Gas	Eocene		2097	30 (G) 38 (O)		Gross Resource: 60-130 million boe		
	Edvard Grieg	16/1-31 S	Oil	Triassic				30	Both Discoveries Reserves:		
	Edvard Grieg	16/1-31 A	Oil					60	4- 37 M boe		
	License 340	24/9-15 S	Oil		119	4310	49	10	1.8- 10 M bbl		
	Oseberg Vestflanken 2 project	30/6-H-9-T4	Oil		Offshore		112		Recoverable: 22 M bbls		
	license 442 (Noaka)	25-2-21	Oil		110	1170	28		Gross: 80- 200 M boe		
	Licence 167	LPOW	Oil						Preliminary: 5 - 25 M boe		
	southwest of Boyla	24/9- 13	Gas	Eocene	118	3433	20	17			
	Goddo prospect	16/5-8a	Oil				20		Preliminary: 1- 10 M boe		
	license 855	7324-6/1	Oil		449	1569	75		Recoverable resources: 20- 65 M bbls		
	Shrek prospect	6507/5-9 S	Oil		350				Recoverable resources: 19- 38 M boe		
Norway	Northwest Balder field	25/7-7	Gas		127		25			Gas+ Condensate: Recoverable: 1- 10 M cum oe	
Occupied Palestinian	Karish North	Karish North-1	Gas	Early Miocene	1700	4880	249			In place: 28- 42 B cum	
Pakistan	Sanghar district	Pandhi 1	Oil			3600			Test: 520 b/d	Test: 258 K m^3/d	
	Kohat	Togh 1	Oil			3200			Tes: 50 b/d	Test: 116 K m^3/d	
	Khyber PakhtunKhawa	Togh # 01	Gas			3200				Test: 116 K m^3/d	Test: 50 b/d
Russia	Urengoyskoye gas field	U2802	Gas	Cretaceous		5624+ 1500 H			Hydraulic Fracturing with 2187 tons Proppant	Test: 1 M m^3/d	Test: 500 Tons/d
Russia	Dinkov +Nyarmeyskoye fields		Gas							1.5 B boe Recoverable resources	
Saudi Arabia	Red Sea		Gas							No Data	
Senegal	Greater Tortue	GTA-1	Gas		2500			30		Production in the first half of 2022	
		Yakaar-2	Gas		2500	4800		30	Appraisla Proved up the southern extension of Yakaara-1		
South Africa	Block 11B/12B, Outeniqua basin	Brulpadda	Gas	L. Cretaceous	Deep	3633		57		Resources: 1 B boe Recoverable: 500- 600 M boe	
South Sudan	North of Adar		Oil						Small discovery		
Trinidad & Tobago	Northern licenses		Gas							Gross: 99 B cum	
		Ginger	Gas		91					No data yet	
Turkey	Siirt provinces		Oil			3500			Proved Reserves: 2 M bbls		
UK	North Sea Glengorm prospect		Gas	Upper Jurassic	86	5056		37		Recoverable resources: 250 M boe	
	Nottinghamshire	Springs Road-1	Gas	Carboniferous	Onshore					Shale gas indications	
	Blackrock	Blackrock 204/5b-2	Oil	Paleocene	1115		34		Thin oil-bearing sandstones		
	Tolmount East	42/28d-14	Gas				73	49		Resources: 6.2 B cum	
	West Newton	West Newton A-1	Oil		Onshore				STOIIP: 146.4- 283 M bbls	GIIP: 6- 7.5 B cum	
USA	GOM- Block 387		Oil	Miocene	1981						
	Mississippi Canyon	Gladden	Oil						Recoverable: 7 M boe		
Vietnam	Block 114	Ken Bau 1X	Gas	Miocene				100			

Technical Affairs/ OAPEC

Table3:

Petroleum Discoveries in OAPEC Members and other Arab Countries

Country	2015		2017		2016		2018		2019*	
	Gas	Oil	Gas	Oil	Gas	Oil	Gas	Oil	Gas	Oil
Algeria	13	11	13	20	16	17			7	1
Bahrain							1	1		
#Egypt	17	26	13	31	18	27	3	4	4	10
Iraq				2		1		1		1
Kuwait		9		7		7				
Libyva	3		1							
Qatar										
+Saudi Arabia			1	2						
Syria										
Tunisia		3				1				
UAE										
OAPEC	33	49	28	62	34	53	4	6	11	12
Mauritania								1		
Morocco							1			
Occupied Palestine	4		2		1		1			
Oman	2				2				1	
Sudan										
Yemen									1	
Total non- OAPEC	**6**	**0**	**2**	**0**	**3**	**0**	**2**	**1**	**2**	**0**
Total Arab Countries	**39**	**49**	**30**	**62**	**37**	**53**	**6**	**7**	**13**	**12**

* Estimates
+ Gas discovery of 2017 is a new gas reservoir in Sahba field
#One of the gas discoveries proved uncommercial

Table 4:

Arab and World Oil Reserves

Billion bbls at Year end

Country	2015	2016	2017	2018	2019*	2019/2018 (%)
Algeria	12.2	12.2	12.2	12.2	12.2	0
Bahrain	0.12	0.12	0.1	0.09	0.09	0
Egypt	3.47	3.47	3.3	3.19	3.19	0
Iraq	143.1	148.4	147.2	145.02	145.02	0
Kuwait	101.5	101.5	101.5	101.5	101.5	0
Libya	49.52	48.36	48.36	48.36	48.36	0
Qatar	25.24	25.24	25.24	25.24	25.24	0
Saudi Arabia	266.46	266.2	266.3	267.26	267.26	0
Syria	2.5	2.5	2.5	2.5	2.5	0
Tunisia	0.43	0.43	0.43	0.43	0.43	0
UAE+	97.8	97.8	97.8	97.8	104.8	7.2
OAPEC	**702.3**	**706.2**	**704.9**	**703.6**	**710.6**	**1.0**
Oman	4.74	4.74	4.74	4.74	4.79	1.1
Sudan	1.5	1.5	1.5	1.5	1.5	0
Yemen	2.67	2.67	2.67	2.67	2.67	0
Total Arab Countries	**711.2**	**715.1**	**713.8**	**712.5**	**719.6**	**1**
Angola	8.42	9.52	8.38	8.16	8.16	0
Ecuador	8.27	8.27	8.27	8.27	8.27	0
Congo	2.98	2.98	2.98	2.98	2.98	0
Equatorial Guinea	1.1	1.1	1.1	1.1	1.1	0
Gabon	2	2	2	2	2	0
Iran	157.53	158.4	155.6	155.6	155.6	0
Nigeria	37.07	37.06	37.45	36.97	36.97	0
Venezuela	41.4	41.4	41.4	41.4	41.4	0
Total Non-Arab OPEC	252.7	256.66	254.21	256.49	256.49	0
Total OPEC #	948.51	956.37	952.82	953.87	935.63	(1.9)
Brazil	16.18	12.99	12.63	12.84	13.24	3.1
UK	2.75	2.56	2.07	2.5	2.7	8
Norway	5.14	6.61	7.7	8.05	8.22	2.1
USA	39.9	35.23	49.9	61.2	70.99	16
Mexico	9.71	7.26	7.22	6.43	5.79	(10.0)
Canada	4.56	4.32	4.71	4.71	5.21	10.5
CIS	119.79	119.79	119.79	119.79	119.79	0
Of which: Azerbaijan	7	7	7	7	7	0
Uzbekistan	0.59	0.59	0.59	0.59	0.59	0
Turkmenistan	0.6	0.6	0.6	0.6	0.6	0
Russian Fed.	80.9	80	80	80	80	0
Kazakhstan	30	30	30	30	30	0
China	25.1	25.62	25.63	25.93	26.15	0.9
Rest of the world	33.8	56.44	50.2	37.65	39.28	4.3
World Total	**1220.9**	**1242.6**	**1247.9**	**1248.1**	**1267.4**	**1.55**
OAPEC/ World (%)	**57.5**	**56.8**	**56.5**	**56.4**	**56.1**	
Arab Countries/ world (%)	**58.3**	**57.6**	**57.2**	**57.1**	**56.8**	
OPEC/ World (%)	**77.7**	**77**	**76.4**	**76.4**	**73.8**	

*Estimates
*According to supreme petroleum council
*Excluding extra heavy oil and bitumen in Venezuela (259 billion bbls according to Petróleos de Venezuela, S.A). Excluding tar sands in Canada (more than 166 billion bbls according to official
Canadian estimates)
#Gabon joined OPEC in 2016, its data is included with OPEC figures since then.
Equatorial Guinea joined OPEC in 2017, its data is included with OPEC figures since then.
Congo joined OPEC in 2018, its data is included with OPEC figures since then.
Qatar left OPEC in 2019, its data is excluded from OPEC figures since then.
BP Statistical Review of World Energy, June, 2019.
Oil & Gas Journal, 1 Jan. 2020.
OPEC Annual Statistical Bulletin, 2019.
OAPEC Data Bank.

Table 5:

Arab and World Natural Gas Reserves

Billion bbls at Year end

Country	2015	2016	2017	2018	2019*	2019 /2018 (%)
Algeria	4505	4505	4505	4505	4505	0
Bahrain	163	224	210	192.5	192.5	0
Egypt	2186	2086	2221	2221	2221	0
Iraq	3694	3820	3744	3729	3729	0
Kuwait	1784	1784	1784	1784	1784	0
Libya	1495	1505	1505	1505	1505	0
Qatar	24299	24073	23861	23861	23861	0
Saudi Arabia	8587	8618	8715	9069	9119	0.6
Syria	285	285	285	285	285	0
Tunisia	65	65	64	64	64	0
UAE+	6091	6091	6091	6091	7731	26.9
OAPEC	**53154**	**53055**	**52985**	**53306**	**54997**	**3.2**
Jordan	6	6	6	6	6	0
Mauritania	28	28	28	28	28	0
Morocco	1	1	1	1	1	0
Oman	705	705	705	707	707	0
Somalia	6	6	6	6	6	0
Sudan	25	25	25	25	25	0
Yemen	479	479	479	479	479	0
Total Arab Countries	54404	54305	54235	54558	56248	3.1
Angola	308	308.1	422	383	344	(10.2)
Ecuador	11	11	10.9	11	11	0
Congo	285	285	285	285	285	0
Equatorial Guinea	54	47	42	42	41	(2.4)
Gabon	25	28.2	26	26	26	0
Iran	34020	33721.2	33810	33899	33987	0.3
Nigeria	5111	5475.2	5627	5675	5723	0.8
Venezuela	5701.5	5739.7	5707	5674	5641	(0.6)
Total Non-Arab OPEC #	**45151**	**45283**	**45645**	**45995**	**46058**	**0.14**
Total OPEC^	**95607**	**95679**	**95850**	**96539**	**74431**	**(22.9)**
Brazil	471.1	425	373	366	364	(1)
UK	205.4	205	183	187	187	0
Norway	1922	1835	1762	1710	1603	(6.3)
USA	10440.5	8616	9022	12278	13076	6.5
Mexico	241	196	196	185	179	(3.2)
Canada	1995.8	2158	2033	2070	1995	(3.6)
CIS	61675	60985	60985	60985	63645	4.4
Of which: Azerbaijan	991	980	980	980	1260	28.6
Uzbekistan	1841	1820	1820	1820	1820	0
Turkmenistan	7504	7420	7420	7420	9800	32.1
Russian Fed.	47806	47270	47270	47270	47270	0
Kazakhstan	2407	2380	2380	2380	2380	0
China	4945.1	5170	5830	5953	6243	4.9
Rest of the world	15436	16210	16933	17364	16319	(6.0)
World Total	**196887**	**195388**	**197196**	**201651**	**205917**	**2.1**
OAPEC/ World (%)	**27**	**27.2**	**26.9**	**26.4**	**26.7**	
Arab Countries/ world (%)	**27.6**	**27.8**	**27.5**	**27.1**	**27.3**	
OPEC/ World (%)	**48.6**	**49**	**48.6**	**47.9**	**36.1**	

*Estimates

+According to supreme petroleum council

#Gabon joined OPEC in 2016, its data is included with OPEC figures since then.

#Equatorial Guinea joined OPEC in 2017, its data is included with OPEC figures since then.

Congo joined OPEC in 2018, its data is included with OPEC figures since then.

Qatar left OPEC in 2019, its data is excluded from OPEC figures since then.

Kuwait and KSA reserves include those of the Neutral zone

BP Statistical Review of World Energy, June, 2019.

Oil & Gas Journal, 1 Jan. 2020.

OPEC Annual Statistical Bulletin, 2019.

OAPEC Data Bank.

Table 6:

Arab and World Hydrocarbon Liquids Production

1000 bpd

Country	2015	2016	2017	2018	2019*	2019 /2018 (%)
Crude Oil						
Algeria	1157	1020	993.34	970	1024	5.6
Bahrain	202	202	197	194	193.9	(0.1)
Egypt	596.2	567	537	544	626	15.1
Iraq	3744	4164	4469	4410	4581	3.9
Kuwait	2883	2954	2704	2736.17	2674	(2.3)
Libya	401.5	390	817	951	1115	17.2
Qatar	649	654	605	600.56	650.1	8.2
Saudi Arabia	10193	10460	9959.2	10317	9900	(4.0)
Syria	9.7	7.97	17	16	24	50
Tunisia	47	43.4	36.6	38.2	37	(3.1)
UAE	2971	3088	2967	3007.2	3062	1.8
OAPEC	**22853**	**23551**	**23302**	**23784**	**23887**	**0.4**
Oman	885	909	897	870	845	(2.9)
Sudan	116	109	100	86	79	(8.1)
Yemen	36	24	31.8	38	38	0
Total Arab countries	**23890.1**	**24593**	**24331**	**24778**	**24849**	**0.3**
Angola	543	549	530	517.2	523.8	1.3
Ecuador	1767	1721.6	1632	1473.3	1365.4	(7.3)
Congo	267	301	354	323.5	344	6.3
Iran	3152	3592	3872	3552.7	2314.4	(34.9)
Venezuela	2654	2403	2124	1510.2	974.2	(35.5)
Gabon	220	219.6	199	193.4	211	9.1
Equatorial Guinea	185	160	129	120.2	108	(10.1)
Nigeria	1748	1518	1536	1601.6	1761.2	10.0
Total Non-Arab OPEC #	9864	10003.2	10022	9292.1	7602	(18.2)
Total OPEC^	31862	32655.9	32536.2	32284	29958	(7.2)
Brazil	2429	2515	2733	2695	2850	5.8
UK	893.6	946.4	990.4	1078	1103	2.3
Norway	1603.7	1630	1965	1840	1690	(8.2)
USA	9415	8857	13131.7	15354	17200	12.0
Mexico	2307.5	2154	2229	2063	1900	(7.9)
Canada	3696	3689	4829	5200	5300	1.9
CIS	13412.1	13710.4	14453.2	14529	14601	0.5
Of which: Azerbaijan	838.5	816.6	793	798.5	772	(3.3)
Uzbekistan	63.7	59.8	62.1	54.3	54	(0.6)
Turkmenistan	231	230	277	276.5	277	0.2
Russian Fed.	10622.2	10924	11360	11357	11450	0.8
Kazakhstan	1581	1595	1877	1956	1956	0.0
China	4292.4	4003.1	3854	3778	3845.2	1.8
Rest of the world	6874.2	7855.1	7001.9	6642.8	6411.8	(3.5)
World Total	**78677.6**	**79955.8**	**85540**	**87250**	**87352**	**0.1**
OAPEC/ World (%)	**29.05**	**29.45**	**27.24**	**27.26**	**27.35**	
Arab Countries/ world (%)	**30.36**	**30.76**	**28.44**	**28.4**	**28.45**	
OPEC/ World (%)	**40.5**	**40.84**	**38.04**	**37**	**34.3**	
NGLs						
OAPEC	4109	4191	4184	4268	4422	3.6
Arab Countries	4207	4288	4273	4378	4525	3.4
World Total	10549	10644	10846	10909	11484	5.3
Total Hydrocarbons						
World	**89227**	**90600**	**96386**	**98159**	**98836**	**0.7**
OAPEC/ World (%)	**30.22**	**30.62**	**28.52**	**28.58**	**28.64**	
Arab Countries/ World (%)	**31.49**	**31.88**	**29.68**	**29.7**	**29.72**	

*Estimates

^Gabon joined OPEC in 2016, its data is included with OPEC figures since then.

^Equatorial Guinea joined OPEC in 2017, its data is included with OPEC figures since then.

^Congo joined OPEC in 2018, its data is included with OPEC figures since then.

^Qatar left OPEC in 2019, its data is excluded from OPEC figures since then.

Parentheses denote negative figures.

BP Statistical Review of World Energy, June, 2019.

Oil & Gas Journal, 1 Jan. 2020.

OPEC Annual Statistical Bulletin, 2019.

OAPEC Data Bank.

Table 7:
Arab Countries and World NGLs Production
x 1000 bpd

Country	2014	2015	2016	2017	2018*	2018/2017 (%)
Algeria	510	510	487	480	468.5	(2.4)
Bahrain	10	9.9	10	9.6	11	14.3
Egypt	170	169.6	153.7	184.4	202.6	9.8
Iraq	43	57.2	56	64	64	0
Kuwait	144	150.4	201.6	205.5	219.8	7.0
Libya	51	53.4	42.3	66.5	77.9	17.1
Qatar	1049	1199	1195	1183	1165.3	(1.5)
Saudi Arabia	1100	1128.9	1194.5	1182	1224.5	3.6
Syria	0.3	0.2	0.2	0.3	0.3	0
Tunisia	3	2.5	2.2	2	2	0
UAE	704.7	828	848.9	807.2	832	3.1
OAPEC	3785	4109	4191	4184	4268	2
Oman	95	96	95.7	87	108.4	24.6
Yemen	3	1.8	1.3	1.1	1.3	18.7
Total Arab countries	**3883**	**4207**	**4288**	**4273**	**4378**	**2.5**
World Total	**9690**	**10549**	**10644**	**10846**	**10909**	**0.6**
OPEC/ World (%)	**39.1**	**39**	**39.4**	**38.6**	**39.1**	**1.4**

*Estimates
Parentheses denote negative figures.
Oil & Energy Trends, Annual Statistical Review, 2019.
OAPEC Data Bank.

Table 8:
Technical Indicators of Started up projects- 2019

			Production			
Country	Block/Field	Well/Area	Oil	Gas	Remarks	Water Depth m
Algeria	Touat project	Sbaa basin		12.7 M m3/d	18 development wells	onshore
Angola	Vandumbu	VAN102-	13 K bpd		new well in Vandumbu field	1500 -1000
	Kaombo Sul		115 K bpd			2000 -1400
Australia	Van Gogh	Exmouth basin			infill project	400
	Greater Enfield	North West Shelf	Estimated to produce gross 2P reserves of 69 million boe			
Brazil	Lula North	Santos basin	150 K bpd	6 M m3/d		2130
	Buzios field	Santos Basin	150 K bpd	6 M m3/d	Fourth FPSO	1980
China	Huizhou 5-32	South China Sea	19,200 bpd		Peak in 2020	115
	Caofeidian 6-11/1-11	Bohai Bay	Peak: 28,700 in 2021		12 Producing wells currently, out of 89 planned wells	25 -20
Egypt	Giza and Fayoum	West Nile Delta		11.2 M m3/d	expected: 19.6 M m3/d	offshore
	South West Meleiha		Initial: 5 Kbpd Expected: 7 Kbpd		2 producing wells	
	Baltim South West	BSW1		2.8 M m3/d		25
Greece	Epsilon field	EA-H3	1000 bpd		5,679 m TMD. Water Depth 30 m	
Iraq	Sarqala field/ Kurdistan	Sarqala3-	120 K bpd		TD: 3,291 m	onshore
	Taq Taq/ Kurdistan	TT20-z	2000 bpd		horizontal sidetrack	
Newfoundland and Labrador	White Rose field		23,640 bpd	3.5 M m3/d	Restart after repair equipment that leaked oil in November 2018	120
Norway	Trestakk oil field		Initial: 22 Kbpd Peak: 44 Kbpd		Resources: 76 M bbls	300
	Utgard field			Expected total volume: 1.71 million cu m of condensate, 2.73 billion cu m of gas, 560,000 tonnes of NGL Peak: 43 K boe/d		120
	Snefrid Nord			4 M m3/d	deepest field development on the NCS	1309
	Johan Sverdrup		Capacity: 660,000 bpd in 2024		Recoverable reserves: 2.7 billion boe (%95 oil)	
Russia	East-Urengoyskoye+North-Esetinskoye	Russian Arctic		Gas: 1 B m3/Y + 200 K ton/Y Condensate		
	South-Khadyryakhinskoye	Yamal-Nenets		1 B m3/Y		
UAE	Haliba		40 K bpd		STOIP: 1.1 B bbls	onshore
UK	Oda Field		Peak: 35 K bpd		Recoverable Reserves: 33 M boe (%95 oil)	65
	Culzean Field	Central Graben		100 K boe/d	Gas+ Condensate	88
	Mariner field	North Sea	Initial 55 K b/d Peak: 70 K b/d			
USA	Buckskin field	GOM	Expected: 30 K bpd			2072
Vietnam	Ca Tam field	CTC1- platform	11,900 bpd		3 wells	60 -15

Technical Affairs/ OAPEC

Table 9:

Marketed Gas

bcm/ year

	2015	2016	2017	*2018	2018/2017 (%)
Algeria	84.6	95	96.6	97.5	0.9
Bahrain	15.4	15.2	15.3	15.4	1.2
Egypt	44.3	42	50.7	60.9	20.2
Iraq	9.7	10.9	11.5	14.5	26.1
Kuwait	16.9	14.7	13.1	13.9	6.2
Libya	19.9	15.6	14.3	13.9	(3.0)
Qatar	170.5	171.6	167	170.3	2
Saudi Arabia	104.5	110.9	115	118	2.6
Syria	4.3	3.8	3.4	3.6	5.9
Tunisia	1.6	1.4	1.3	1.2	(7.7)
UAE	60.2	61.9	49.8	53.2	6.8
OAPEC	532	543	538	562	4.5
Jordan	0.15	0.1	0.1	0.1	0
Morocco	0.09	0.1	0.1	0.1	0
Oman	29.1	29.8	28.82	33	14.5
Yemen	2.85	0.5	0.5	0.5	0
Total Arab countries	563.9	573.5	567.5	596.1	5
Angola	0.72	1.9	3.1	9.6	209
Ecuador	0.5	0.5	0.46	0.3	(24.6)
Congo	0.93	0.87	0.86	0.9	0.8
Equatorial Guinea	6.2	6.2	6.6	7.8	17.4
Gabon	0.55	0.6	0.5	0.5	8.9
Iran	226.7	226.9	238	248.5	4.4
Nigeria	45.1	42.6	45.4	44.3	(2.6)
Venezuela	26	27.7	29.8	24.8	(16.8)
Total Non-Arab OPEC	299	300.2	323.9	336.7	3.9
Total OPEC **	765.2	780.7	791.2	817.9	3.4
UK	40.7	41.8	41.9	40.6	(3.1)
Norway	116.2	115.8	123.2	120.6	(2.1)
USA	740.3	729.3	745.8	831.8	11.5
Mexico	47.9	43.7	38.3	37.4	(2.3)
Canada	160.9	171.6	177.6	184.7	4
CIS	771.6	769.8	789.1	831.1	5.3
Of which: Azerbaijan	18.8	18.3	17.7	18.8	5.8
Uzbekistan	54.6	53.1	53.4	56.6	6.1
Turkmenistan	72.8	66.9	58.7	61.5	4.8
Russian Fed.	584.4	589.3	635.6	669.5	5.3
Kazakhstan	22	22.9	23.4	24.4	4.1
China	135.7	137.9	149.2	161.5	8.3
Rest of the world	674	680	708	701	(0.9)
World Total	**3,550**	**3,564**	**3,664**	**3,842**	**4.8**
OAPEC/ World (%)	**15**	**15.2**	**14.7**	**14.6**	
Arab Countries/ world (%)	**15.9**	**16.1**	**15.5**	**15.5**	
OPEC/ World (%)	**21.6**	**21.9**	**21.6**	**21.3**	

* Estimates

**Equatorial Guinea joined OPEC in 2017, its data is included with OPEC figures since then.

**Congo joined OPEC in 2018, its data is included with OPEC figures since then.

Total OPEC before 2018 exclude Equatorial Guinea and Congo.

Total OPEC in 2015 Excludes Gabon

Parentheses denote negative figures.

Oil & Gas Journal 2020

OPEC Annual Statistical Bulletin 2019.

BP Statistical review of world energy full report 2019.

Data Bank/ OAPEC

Table 10:
World Coal Reserves
Billion tons at year end

	2014	2015	2016	2017	2018
North America	245.1	245.1	259.4	258.7	258
Canada	6.6	6.6	6.6	6.6	6.6
USA	237.3	237.3	251.6	250.9	250.9
Central & South America	14.6	14.6	14	14	14
Of which: Brazil	6.6	6.6	6.6	6.6	6.6
Colombia	6.7	6.7	4.9	4.9	4.9
Europe and Eurasia	310.5	310.5	322.1	323.6	323.4
Asia/Pacific	288.3	288.3	529.4	424.2	444.9
Of which: Australia	76.4	76.4	144.8	144.8	147.4
Indonesia	28	28	25.6	22.6	37
China	114.5	114.5	244	138.8	138.8
India	60.6	60.6	94.8	97.7	101.4
Africa	31.8	31.8	13.2	13.2	13.2
Of which: South Africa	30.2	30.2	9.9	9.9	9.9
Middle East	1.1	1.1	1.2	1.2	1.2
World total	**891.5**	**891.5**	**1139.3**	**1035**	**1054.8**

BP Statistical Review of World Energy, June 2015- June 2019

Table 11:
World Coal Production
Million tons/year

	2014	2015	2016	2017	2018
North America	990.1	887.9	733	772.2	753.5
Canada	67.9	62	60.9	59.5	54.6
Mexico	13.8	12.3	11.4	10.4	13.5
USA	906.9	813.7	660.8	702.3	685.4
Central & South America	101.8	96.1	101.3	99.7	88.8
Of which: Brazil	7.7	6.4	5.9	4.3	2.7
Colombia	88.6	85.5	90.5	89.4	84.3
Europe and Eurasia	1207.7	1180.2	1163.1	1223.5	1240
Of which: Germany	185.8	184.3	175.7	175.1	169
Russia	357.4	372.6	386.6	412.5	441.3
Asia/Pacific	5618	5522.4	5230.1	5359.7	5656
Of which: Australia	491.5	505.4	503.9	481.3	485.5
China	3874	3746.5	3410.6	3523.2	3683
India	644	674.2	693.3	716	765.1
Africa	276.7	266	262.8	271.8	272.9
Of which: South Africa	260.5	252.1	251.2	252.3	252.7
Middle East	1.5	1.5	1.6	1.6	1.6
World total	**8195.7**	**7954.2**	**7492**	**7727.3**	**8012.8**

BP Statistical Review of World Energy, June 2015- June 2019.

Table 12:
Nuclear Power Reactors in Operation and Under Construction

Country*	Operational		Under Construction		Electricity Generated by Nuclear Power 2017	
	No. of Units	Capacity Mwe	No. of Units	Capacity Mwe	TWh	% of total Electricity
USA	99	99952	42	2234	805.6	20
France	58	63130	1	1630	381.8	71.6
Japan	42	39752	2	2653	29.3	3.6
China	39	34514	18	19016	232.8	3.9
Russia	35	26142	7	5520	190.1	17.8
South Korea	24	22494	4	5360	141.3	27.1
India	22	6255	7	4824	34.9	3.2
Canada	19	13554	-	-	95.1	14.6
Ukraine	15	13107	2	2070	80.4	55.1
UK	15	8918	-	-	63.9	19.3
Sweden	8	8629	-	-	63.1	39.6
Germany	7	9515	-	-	72.2	11.6
Spain	7	7121	-	-	55.6	21.2
Belgium	7	5918	-	-	40.2	49.9
Taiwan	6	5052	2	2600	21.6	9.3
Czech Republic	6	3930	-	-	26.8	33.1
Switzerland	5	3333	-	-	19.6	33.4
Finland	4	2769	1	1600	21.6	33.2
Hungary	4	1889	-	-	15.2	50
Slovakia	4	1814	2	880	14	54
Pakistan	5	1318	2	2028	8.1	6.2
Argentina	3	1633	1	25	5.7	4.5
Bulgaria	2	1926			14.9	34.3
Brazil	2	1884	1	1340	14.9	2.7
South Africa	2	1860	-	-	15.1	6.7
Mexico	2	1552	-	-	10.6	6
Romania	2	1300	-	-	10.6	17.7
Iran	1	915	-	-	6.4	2.2
Slovenia	1	688	-	-	6	39.1
Netherland	1	482	-	-	3.3	2.9
Armenia	1	375	-	-	2.4	32.5
Belorussia	-	-	2	2220	-	-
UAE	-	-	4	5380	-	-
Total	**448**	**391721**	**59**	**60460**	**2503**	

IAEA, Nuclear Power Reactors in the World، 2018.
*Sorted according to number of operational unites

Table (2-13)

Renewable Energy Indicators 2017- 2018

		2017	2018
New investment (annual) in renewable power	billion USD	326	289
Total Global Power	GW		
Renewable power capacity (including hydropower)	GW	2,197	2,378
Renewable power capacity (not including hydropower)	GW	1,081	1,246
Hydropower capacity	GW	1,114	1,132
Bio-power capacity	GW	122	130
Geothermal power capacity	GW	12.8	13.3
Solar PV capacity	GW	402	505
Concentrating solar thermal power (CSP) capacity	GW	4.9	5.5
Wind power capacity	GW	539	591
Ocean power capacity	GW	0.5	0.5
Bioelectricity generation	TWh	532	581

Source: Advancing the Global Renewable Energy Transition, Ren21 Renewables 2019 Global Status Report

Table (2-14)

The total production of renewable energies in Arab countries for the year 2018

Country	Total renewable energies produced in 2018 (MW)
Algeria	358
Bahrain	6
Egypt	4813
Iraq	2311
KSA	142
Kuwait	41
Libya	5
Qatar	43
Syria	1503
Tunisia	673
UAE	596
Total production of OAPEC member countries	**10491**
Jordan	1071
Mauritania	186
Morocco	2566
Oman	8
Palestine	36
Lebanon	307
Sudan	2136
Yemen	150
Total non-OAPEC countries	**6460**
Total production of Arab countries	**16951**

Source: IRENA RENEWABLE CAPACITY STATISTICS

Figure 1
Average Number of Active Rigs Worldwide

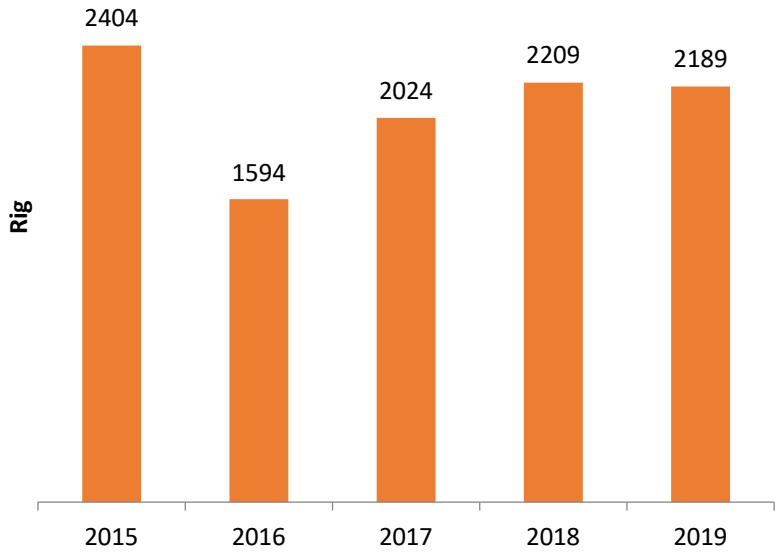


Figure 2
Arab and World Oil Reserves. International Grouping 2019

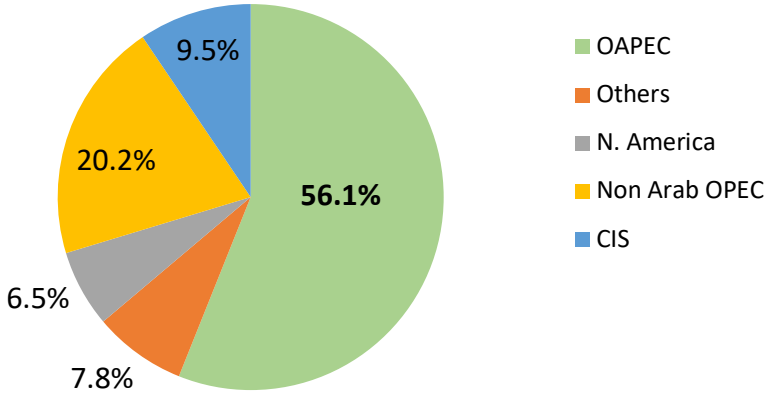


Figure 3
Arab and World Gas Reserves. International Grouping 2019

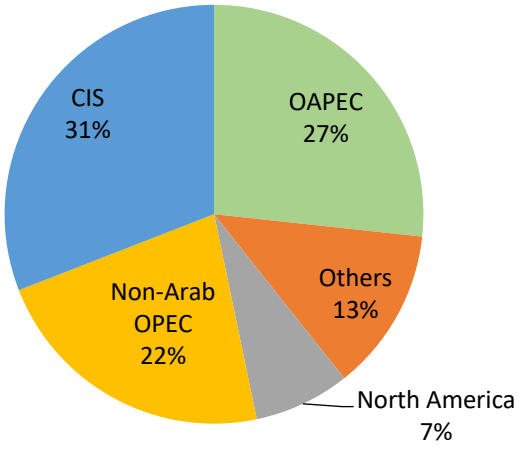


Figure 4
World Oil Production by International Groups, 2019

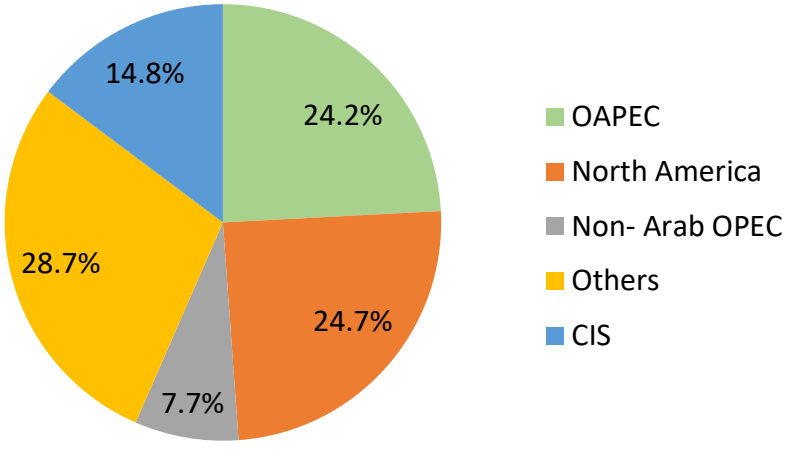


Figure 5
World Marketed Gas by International Groups, 2018

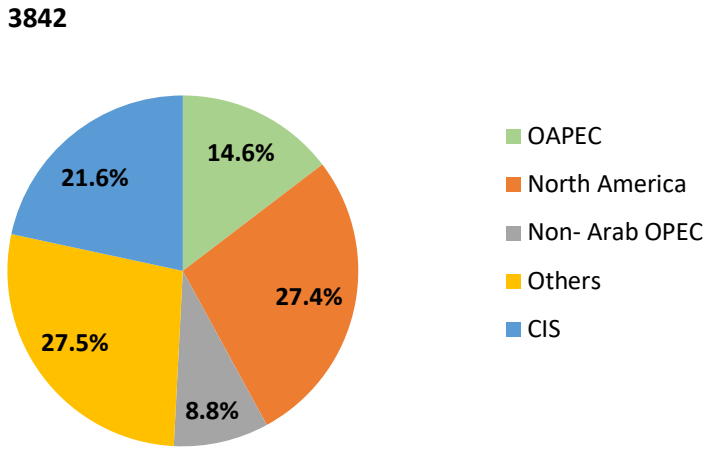


Figure 6
Coal Reserves by International Groups, 2018

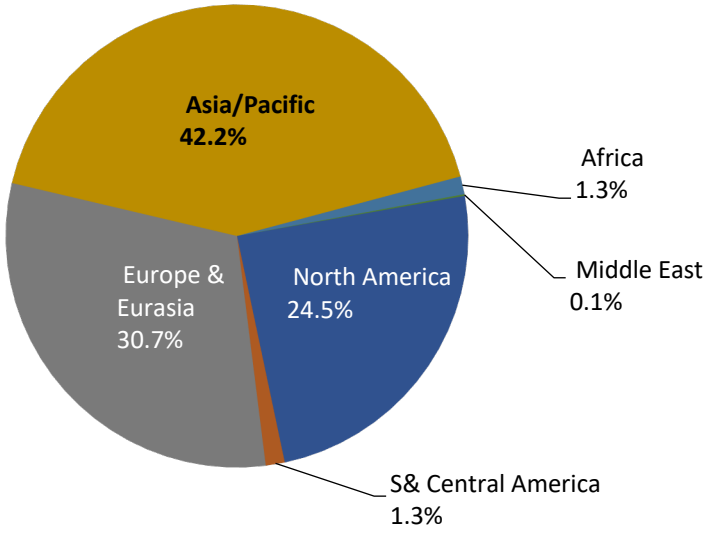
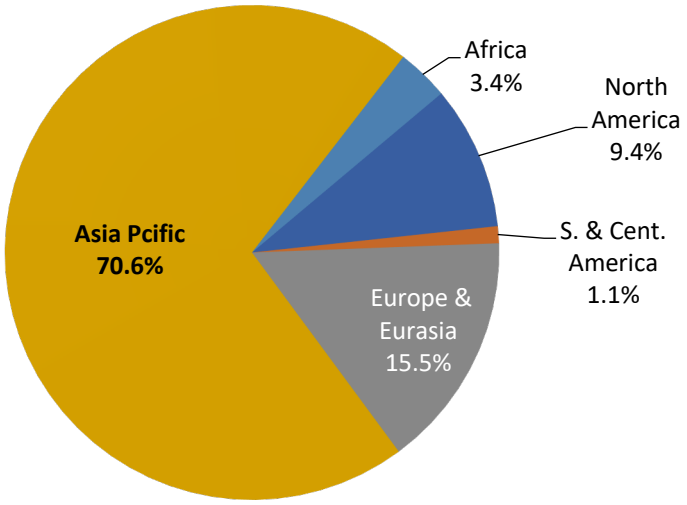


Figure 7
Coal Production, Share of International Groups 2018



DOWNSTREAM INDUSTRY

- REFINING
- PETROCHEMICALS
- NATURAL GAS CONSUMPTION, TRADE & PROCESSING

ARAB AND WORLD DEVELOPMENTS IN PETROLEUM DOWNSTREAM INDUSTRIES

I. REFINING INDUSTRY

1. World Developments

The world's total refining capacity reached 93.27 million b/d in 2019 against 92.89 million b/d by the end of 2018; registering a net increase of 375 thousand b/d (or 0.4%) compared to 2018. The total number of operating refineries remained unchanged at 637. Two refineries were shut down: Philadelphia (USA) and Pardubice Refinery (Czech Republic); while two refineries started operations in China: Hengli and Zhoushan.

During 2019, the oil refining industry saw most of the world trending towards upgrading existing refineries to meet the

International Maritime Organization (IMO) resolution requirements on reducing sulphur in marine fuel from 3.5% to 0.5% by January 2020. In addition to maximising integration between refining processes in existing refineries and improving production efficiency by increasing the capacity of downstream manufacturing operations.

2. Developments in the Arab World

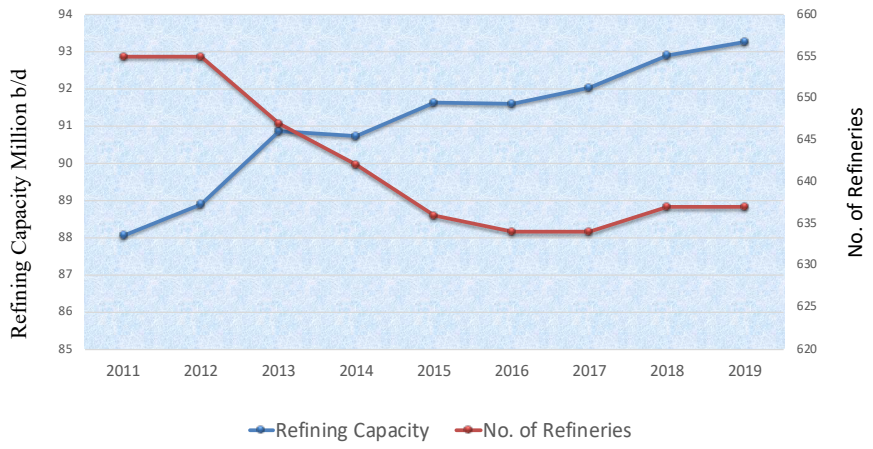
The total refining capacity of the Arab countries recorded an increase of 90 thousand b/d in 2019, as a result of bringing on stream the second phase of the reconstruction of Baiji Refinery at a capacity of 70,000 b/d, as well as, upgrading Algeria Refinery from 58 thousand to 78 thousand b/d.

Total refining capacities of the 52 oil refineries in OAPEC member countries accounted for 8.37 million b/d, or 90.75% of the total refining capacity of the Arab countries of 9.223 million

Table 3-1
World Existing Topping Distillation Capacity by Region, 2018 and 2019
(Million b/d)

	2018	2019	Difference	(%) Change 2019/2018
Africa	3.59	3.61	0.02	0.56
Asia/Pacific	27.40	28.00	0.60	2.19
Eastern Europe/CIS	10.15	10.14	(0.02)	(0.15)
Middle East	9.41	9.48	0.07	0.74
North America	21.62	21.32	(0.30)	(1.39)
South America/Caribbean	6.48	6.48	0.00	0.00
Western Europe	14.24	14.24	0.00	0.00
Total	92.89	93.27	0.375	0.40

Source:
- OAPEC Refining Industry Database



b/d. Total refining capacity of the 11 oil refineries in other non-OAPEC Arab countries accounted for the remaining 853 thousand b/d, or 9.25%, of the Arab total.

Table (3-2) shows the evolution of refining capacity in the Arab countries from 2015 to 2019.

Arab countries are witnessing noticeable development towards executing new refineries projects as well as upgrading existing ones. Here's a brief overview of the most significant developments in 2019.

In the UAE, Abu Dhabi National Oil Co. (ADNOC) announced it will look into boosting its refining capacity by 60% from 902 thousand b/d up to 1.5 million b/d by 2025, as part of its strategy to become one of the most important global downstream hubs. The plan includes setting up a refinery at a capacity of 600 thousand b/d in the industrial hub of Ruwais that is capable of processing various types of crude oil.

Also, work ongoing to upgrade Ruwais-West refinery to process 420 thousand b/d of the low-quality Upper Zakum oil instead of the high-quality Murban oil. This is in order to export Murban and make profit out of the price difference.

Work is also ongoing in Jebel Ali condensates refinery in Dubai; and the new 250 thousand b/d refinery in Fujairah to produce marine fuel observing IMO standards.

In Bahrain, construction continued at the upgrading and modernisation project at the Sitra oil refinery of Bahrain Petroleum Company (Bapco). The upgrading scheme will raise the Sitra refinery's capacity to 360 thousand b/d from the current 260 thousand b/d when it is complete in 2021, at a cost of about $6-8 billion.

In Algeria, Sonatrach (Société Nationale pour la Recherche, la Production, le Transport, la Transformation, et la Commercialisation des Hydrocarbures) announced the completion of the Algiers Refinery upgrade project to raise its refining capacity from 58 thousand b/d to 78 thousand b/d. The project comes as a part of a plan to expand the Algeria's refining capacity through upgrading its existing refineries and building 3 new ones in Biskra, Ghardaia, and Hassi Messaoud; at a capacity of 100 thousand b/d each. Work is still ongoing in Skikda Refinery upgrade project, in order to maximise gasoline production and improve its quality in line with Euro-5 standards.

In Saudi Arabia, Aramco announced a project on upgrading Ras Tanura Refinery, the largest in Saudi Arabia, with a capacity of 550 thousand b/d. Also, Petro Rabigh

has signed a contract to upgrade Rabigh refinery and petrochemicals complex in Rabigh city with a capacity of 400 thousand b/d.

On another note, KSA plans to increase its external project's refining capacity to ensure the sustainability of selling contracts for its crude oil output. It launched negotiations with South Africa's Petro SA on establishing an integrated refinery at South Africa's petrochemicals complex. Saudi Aramco, in collaboration with Abu Dhabi National Oil Co. (Adnoc) and a consortium of national Indian companies, announced moving the site of their joint project in Ratnagiri- which constitutes building 3 massive refineries with a capacity of 400 thousand b/d each and integrated to a petrochemicals complex- to Raigad, southern Mumbai.

Also, Aramco and Indonesia's PT Pertamina have extended negotiations on buying a 45% share of Pertamina's Cilacap oil refinery, priced at $ 6 billion.

In Iraq, the Iraqi Oil Ministry announced it started operating the new 70,000 b/d atmospheric distillation unit at Baiji Refinery.

Basra Refinery, which will increase the refinery's capacity to 210,000 b/d. it has also signed a loan agreement to fund Al Basra Refinery upgrading project as part of a plan to meet the domestic petroleum products demand, through upgrading the refining capacity of existing refineries and building new ones like the Al Faw Refinery at the Arabian Gulf at a capacity of 300 thousand b/d; and its 100,000 b/d Qayara Refinery for processing heavy oil from neighbouring fields.

In Kuwait, the Kuwait National Petroleum Company (KNPC) announced making progress in executing the clean fuels project comprising the revamping of the existing Mina Al Ahmadi Refinery and Mina Abdulla Refinery; in addition to establishing the new 615 thousand b/d Al Zour Refinery. It also announced the closure of the 200 thousand b/d Shuaiba Refinery. Kuwait has also announced plans to increase its total refining capacity up to 2 million b/d by 2035, through the establishing of a new 600 thousand b/d refinery, or two new ones at a capacity of 300 thousand b/d each.

Kuwait Petroleum International (KPI) plans to raise its stake of refining capacity at refineries outside Kuwait up to 800 thousand b/d in the next 5 years, then up to 1.3 million b/d by 2030. In this vein, construction work is still progressing at the integrated refinery complex project in Zhanjiang, China; and at Al Duqm refinery in Oman, a 50-50 joint venture with Oman's Oil Company (OOC).

In Egypt, the Egyptian Refining Company (ERC) announced starting the construction of a hydrocracking complex in Mostorod Refinery, to process fuel oil produced at Cairo Oil Refinery Company (CORC) into high-quality/value products. Work is still progressing at the capacity upgrading project of the MIDOR refinery in Alexandria, from 115 thousand b/d to 175 thousand b/d; and at the 90 thousand b/d Assiut oil refinery. There are also other projects on revamping and upgrading of the existing coking unit, and establishing a new 95.5 b/d coking unit at the Suez Oil Processing Co.

Table 3-2
Installed Refining Capacity in the Arab Countries, 2015 - 2019
(Thousand b/d)

	Number of Refineries 2019 in	2015	2016	2017	2018	2019
Algeria	6	650.9	650.9	650.9	650.9	670.9
Bahrain	1	260.0	260.0	260.0	260.0	260.0
Egypt	8	769.8	769.8	769.8	769.8	769.8
Iraq	12	946.0	622.0	662.0	802.0	872.0
Kuwait	2	936.0	936.0	736.0	736.0	736.0
Libya	5	380.0	380.0	380.0	380.0	380.0
Qatar	2	283.0	429.0	429.0	429.0	429.0
Saudi Arabia	8	2907.0	2907.0	2819.0	2859.0	2859.0
Syria	2	240.1	240.1	240.1	240.1	240.1
Tunisia	1	34.0	34.0	34.0	34.0	34.0
UAE	5	1119.0	1119.0	1119.0	1119.0	1119.0
Total OAPEC	52	8525.8	8347.8	8099.8	8279.8	8369.8
Jordan	1	90.4	90.4	90.4	90.4	90.4
Sudan	3	140.0	140.0	140.0	140.0	140.0
Oman	2	222.0	222.0	222.0	222.0	303.0
Morocco	2	154.7	154.7	154.7	154.7	154.7
Mauritania	1	25.0	25.0	25.0	25.0	25.0
Yemen	2	140.0	140.0	140.0	140.0	140.0
Total other Arab Countries	**11**	**772.1**	**772.1**	**772.1**	**772.1**	**853.1**
Total ArabCountries	**63**	**9297.9**	**9297.9**	**9297.9**	**9297.9**	**9222.9**

Source:
- OAPEC Refining Industry Database

II. PETROCHEMICALS INDUSTRY

World Developments

Developed countries consume up to 20 folds of the various types of plastic products compared to developing countries. This underscores global high growth potentials of the petrochemicals industry. In spite of the massive efforts on plastic recycling and reduction of the use of disposal plastic items- especially in Europe, Japan, and South Korea- the big rise in plastic consumption in remerging economies surpasses any potential drop in demand.

According to the International Energy Agency (IEA) data, petrochemicals demand growth rates are expected to represent more than one third of the global oil demand growth until 2030 and about one half until 2050. Petrochemicals would also have a larger influence on the future of oil demand than vehicles, trucks, and aviation fuel demand growth rates.

Fitch Solutions estimates showed an increase in ethylene total production design capacity worldwide in 2019 by about 5.4% compared to 2018, reaching about 196 million tons/annum, against 186 million ton/annum in 2018.

World ethylene production design capacity is expected to grow by 10.7% in 2019-2022, up to about 217 million tons/annum by 2022, driven by demand growth in Asia and North America.

It is projected that Asia- Pacific region would lead new investments in the next five years, especially ethylene production projects. 55 new projects have been announced with a capacity of about 35.3 million tons/annum and about $ 288 billion, 13 of which are in the planning phase.

China tops the Asia- Pacific region in terms of number of projects and new expansions driven by its economic growth. It announced 33 new petrochemicals projects making the country an attractive hub for new global petrochemicals investments in the coming period.

Total ethylene design capacities in Asia- Pacific have reached about 66 million tons/annum in 2019; making the region the top of the list worldwide. The USA followed; its second wave of the ethylene production projects would add more than 5 million tons/annum, along with the largest polyethylene project expansions with a capacity of about 8 million tons/annum by 2020. The combined capital investments of the two waves of ethylene cracking projects would exceed about $ 50 billion each. Planned and declared petrochemicals production capacities are expected to rise up to about 44.5 million tons/annum by 2022.

On the other hand, MENA region's ethylene production capacities are expected to rise to 42 million tons/annum in 2022, to become third on the list worldwide. FSU countries came fourth in terms of highest growth rates as ethylene production capacities would rise to 12.18 million tons/annum in 2022. The Russian Federation tops the list of countries to add new capacities with an estimated contribution of about 5.76 million tons/annum by 2022.

Africa's ethylene capacity is expected to grow by 20.6% on a compound annual growth rate basis up to 4.63 million tons/annum in 2022. Egypt is projected

to top the region with added production capacities of 2.16 million tons/annum by 2022. KSA has maintained its global ranking in 2019 in terms of the highest ethylene production capacity worldwide. It came third with a capacity of 18.2 million tons/annum, following China that came second with a capacity of 27.9 million tons/annum and the USA that came first with a capacity of 41.4 million tons/annum.

Ethylene, propylene, and butadiene production has dropped in Western Europe, especially Germany, France, Spain, and Poland in the first half of 2019 by 7-8% compared to the same period in 2018. The year 2019 was distinguished by maintenance work done for about 13 stream cracking units, whether scheduled or on emergency, which have not been completed on time in all plants. That has coincided with a halt in the activities of two of the biggest production companies in Europe, which are affiliates to BASF (Antwerp, Belgium) and Shell (Mudrek, the Netherlands).

Arab World Developments

The Abu Dhabi National Oil Company (ADNOC) plans to explore development of an Ethylene Dichloride facility adjacent to ADNOC's integrated refining and petrochemical site in Ruwais. The project will accelerate the delivery of its 2030 strategy, boosted by a $ 45 billion investment.

Moreover, ADNOC and OCI plan to complete their strategic partnership in fertilizer business, the joint venture will become the largest export-focused nitrogen fertilizer platform globally, and the largest producer in the MENA region with a production capacity of 5 million tons of urea and 1.5 million tons of sellable ammonia.

Algeria's Sonatrach has signed an agreement with Total to build a new unit for propylene production with a capacity of 550,000 t/y. The plant will be in Arzew, Algeria.

In KSA, Samsung Engineering and Mammoet are scheduled to start transporting and installing 49 modules for the construction of Jubail United Petrochemical Company's ethylene oxide-ethylene glycol (EO/EG) plant in Saudi Arabia, which upon completion in 2020 will produce 700,000 tons of both products each year.

In Qatar, Qatar Petroleum has chosen Chevron Phillips Chemical as a partner (with a 70:30% share) to develop, build, and operate a petrochemicals complex in Ras Laffan Industrial City, Qatar, that will produce ethylene and high-density polyethylene (HDPE). The proposed complex will include a 1.9 million tons/annum ethane cracker as well as two HDPE derivative. It will come online by 2025 and tap the increased North Field production for feedstock. The plant will be the Middle East's largest and one of the biggest in the world, which will increase Qatar's polyethylene output capacity by 82%.

In Kuwait, Kuwait Integrated Petroleum Industries Co. (KIPIC) has chosen McDermott International Inc. to provide technology for a new 330 thousand tons/annum unit for propylene production at KIPIC's complex.

On another note, Egypt's petrochemicals sector is expected to witness a significant development due

to the massive evolution in natural gas production. Production has jumped from 3.9 billion cubic feet/day in 2016 to 5.7 billion cubic feet/day in 2018, which would provide primary feedstock for petrochemicals projects at competitive prices. It will also help improve investment climate in new projects. The value of the projects in the sector has risen from $12.4 billion in October 2014 to $ 30.5 billion in August 2019, which makes Egypt the third largest MENA market after KSA and Iran ($41.6 billion and $40.6 billion respectively).

Egypt's Petroleum and Mineral Resources Ministry has announced a number of petrochemicals projects schedule for execution soon; including: the construction of a new integrated refining and petrochemical complex at New Al Alamein with crude and condensate processing capacity of 2.5 million tons/annum (investment cost: about $ 8.5 billion); and a refining and petrochemical complex at the economic zone of the Suez Canal (investment cost: $ 6 billion).

Oman plans to execute four new hydrocarbon and petrochemical projects worth $2.5 billion in investments on a land reclaimed from the sea, designed to add around 250 hectares to Sohar South expansion project. A two-year timeframe is envisioned for the completion of dredging and reclamation, which will be followed by a three-year window for the execution of the projects.

III NATURAL GAS CONSUMPTION, TRADE & PROCESSING

World Developments

- **Natural Gas Consumption**

World natural gas demand has grown significantly in 2018 by 5.3%, the highest in 30 years. Consumption has risen in 2018 driven by growing USA demand. It hit 3848.9 billion cubic metres against about 3654 billion cubic metres in 2017. The share of natural gas in the world's total primary energy consumption in 2018 has increased to 23.9% compared to 23.3% in 2017.

In 2018, most parts of the world have maintained natural gas contribution to the primary energy balance, with slight to medium changes compared to the previous year. The Middle East has registered the highest rate with 52.7% against 51.4% in 2017. Europe and Eurasia registered about 32.6% against 32.4% in 2017. Natural gas contribution has risen in Africa to 27.9% in 2018 compared to 27% in 2017. Asia- Pacific recorded an increase to 11.9% compared to 11.5% in 2017. The contribution jumped in North America to 31% compared to 29.2% in 2017. In Central and South Americas, natural gas contribution has declined to 20.6% in 2018 compared to 21.2% in 2017, in line with drop in demand. In light of these developments, natural gas share in the global energy balance has risen to 23.9% in 2018 compared to 23.3% in 2017.

- **Natural Gas Trade**

Natural gas trade has grown significantly in 2018 by 9% registering 1236.4 billion cubic metres against about 1134.5 billion cubic metres in 2017. These figures cover gas exports via both pipelines and as liquefied natural gas (LNG). The total amount of both claims about 32.1% of the total natural gas consumption worldwide.

The volume of natural gas exports by pipelines rose from 740.7 billion cubic metres in 2017 to 805.4 billion cubic metres in 2018, or by an increase of 8.7%. This is attributed to recovery of gas via pipelines trade in European markets. LNG trade has grown significantly by about 10% in 2018. Total exports registered about 431 billion cubic metres compared to about 393.8 billion cubic metres in 2017, an increase of 37billion cubic metres. In general, LNG exports accounted for 34.9% of the world total gas exports in 2018, with a slight increase of 34.7% compared to 2017. Pipeline gas exports accounted for 65.1% of total natural gas exports in 2018, with a slight decline against 65.3% recorded in 2017.

- **Global Natural Gas Prices**

Natural gas prices, for both pipeline and LNG sales, rose in most major markets in 2018 compared to its rates in 2017, driven by growing demand. The price of natural gas has risen by 5.7% in the USA; 24.1% in Japan; 17.8% in the EU; and 39% in the UK. It dropped, however, in Canada by 30.3%.

- **LNG Production Capacity**

By the end of 2018, the world's nominal LNG production capacity reached about 403.3 million tons/year against 363.3 million tons in 2017, or an increase of

11%. This is due to bringing new projects online in Australia, Russia, and the USA. Cameroon has also joined LNG exporting countries after bringing its Kribi floating plant online at a capacity of 2.4 million tons/year.

The new projects in Australia contributed to its topping the world in terms of total natural gas liquefaction capacity by the end of 2018 by about 83.1 tons/year with a share of 20.6% of the world's total production capacity. Qatar retreated to second on the list with a capacity of 77 million tons/year with a share of 19.1%. The USA jumped to third on the list overtaking Malaysia with a total capacity of 33.75 million tons/year (including Alaska) and a share of 8.4% of the world's total. The three countries combined accounted for about 48.1% of the world total LNG production capacity by the end of 2018.

Arab World Developments

Total natural gas exports from Arab countries have risen in 2018 to about 204.7 billion cubic metres against about 199.5 billion cubic metres in 2017. Arab countries' exports are expected to grow in coming years in case of the re-operationalising of the partially stopped liquefication complexes in Egypt and the Arab gas pipeline extending from Egypt to Jordan and Syria. The combined Arab countries' share of natural gas experts has dropped in 2018 to 16.6% of the world's total. Qatar has maintained its position on top of the Arab countries in terms of exports in 2018 with about 125 billion cubic metres (61.1% of the total Arab countries' exports), followed by Algeria with 52.4 billion cubic metres (25.6%); Oman (6.6%), UAE (3.6%), Libya (2.1%), and Egypt (1%).

By the end of 2018, the Arab World's total nominal LNG production capacity reached 137.4 million tons/year (as shown in the table below). Qatar still tops the Arab countries with 56% of the total Arab production, followed by Algeria (18.4%), Egypt (8.9%), Oman (7.6%), Yemen (4.9%), and UAE (4.2%).

- **Developments by country:**

UAE

Abu Dhabi National Oil Co. (ADNOC) Sour Gas, in charge of upgrading Shah field for sour gas, plans to increase the field's production from 1 billion scf/d to 1.5 billion cf/d, by removing blockage at the existing processing plant including two gas processors.

Bahrain

Bahrain's first liquefied natural gas (LNG) floating unit "Bahrain Spirit" arrived in the beginning of 2019 at the receiving and regasification terminal within the Khalifa bin Salman Port facility, in Hidd, Bahrain. It is to meet growing domestic gas demand when necessary.

The project's primary capacity is about 400 million cubic feet per day that is expandable to 800 million cubic feet per day in the future.

Tunisia

(OMV) announced that work progress reached 98.3% at Nawara field development project. It is expected to go online before the end of 2019. Also, in light of the preparations to launch

the project that was scheduled to start operations in 2017, Tunisia's (ETAP) announced in August the completion of the construction of Nawara field's Central Processing Facility (CPF) with a design capacity of 95 million cubic feet per day. It went into commissioning by receiving the gas output from Adam field at a rate of 23 million cubic feet per day. The Commissioning is due to be completed before the end of 2019 in order to begin operations.

Algeria

Algeria's Sonatrach have started natural gas production at Touat project with about 450 million cubic feet per day (approx. 4.5 billion cubic metre per year). A consortium of Sonatrach and Neptune Energy Group (with 35/65% shares respectively) is in charge of its development. The project comprises a second stage to develop various gas fields to ensure the sustainability of production at 4.5 billion cubic metres per year over a period of 20 years.

Saudi Arabia

Saudi Aramco announced the proximity of completion of all construction work at Al Fadhili non-associated gas processing plant. It will come on stream by the end of 2019. The plant will process 2 billion scfd /d of gas from the offshore Hisbah field, and 500 million scfd/d from the onshore Kharsaniya gas field.

Iraq

Iraq's South Gas Company announced signing a memorandum of understanding (MoU) with Honeywell for investment in associated gas processing from the Artawi southern oilfield, Basra, Iraq. The project will invest in associated gas from large oilfields, namely Majnoon, West Qurna-1, Luhaise, Tuba, and Saba, at a primary capacity of 300 million standard cubic feet per day, up to 600 million standard cubic feet per day in the future. It will start operations by 2022.

Qatar

Qatar Petroleum reported it has issued the invitation to tender package for engineering, procurement, and construction of the four LNG mega trains of its North field expansion project. The package has been issued to three EPC joint ventures: Chiyoda and Technip France; JGC and Hyundai Engineering & Construction Co.; and Saipem, McDermott Middle East, and CTCI. The tender EPC contract will be awarded in 2020.

Kuwait

Kuwait Petroleum Corporation (KPC) plans to boost its natural gas output capacity to 1 billion scf per day (scfd) by 2023 from its Jurassic fields, an increase of 100% from its current 500 million scfd rate. The next phase should include the instalment and operationalising of two production units at a capacity of 160 million cfd/gas, and 50 thousand b/d of condensates.

Libya

Libya's National Oil Corporation (NOC) and Italian oil major Eni signed a memorandum of understanding (MoU), concerning forming a joint steering

committee to expedite gas production at structures 'A' and 'E' within maritime concession MN 41 in the Sabratha marine basin, offshore Tripoli. Once completed, project capacity from both structures will total 760 million cubic feet of natural gas per day, at a cost of $ 5.6 billion. Eni expects final investment decision to be made during 2020, production to start from structures A and E by 2022 and 2024 respectively.

Egypt

BP announced starting operations at the second phase of its West Nile Delta development offshore project in Egypt. It is currently producing around 400 million cubic feet of gas per day (mmscfd) and is expected to ramp up to a maximum rate of approximately 700 mmscfd before mid-2019.

Also, Eni and BP started announced the successful commissioning and start-up of production of the offshore Baltim South West gas field in Egypt, with an initial production rate of 100 million standard cubic feet per day (scf/d) to be increased to 500 scf/d in 2020.

Eni has also successfully managed to accelerate raising gas production from the giant Zohr gas field to 2.7 billion scf/d, scheduled to be raised further to 3.2 billion scf/d by the end of 2019.

Table 3-3

Natural Gas Consumption by Region, 2017 and 2018

Billion cubic meter

	2017	2018	(%) Change* 2017/2018
Africa	140.8	150.0	6.60
Asia/Pacific	768.3	825.3	7.4
Central & South America	172.6	168.4	(2.5)
Europe & Eurasia**	1109.7	1129.8	1.81
Middle East	527.0	553.1	4.9
North America	935.5	1022.3	9.30
Total	**3654.0**	**3848.9**	**5.3**

*Annual changes are calculated based million tonnes oil equivalent figures
** CIS , Europe and Turkey represented by Europe & Eurasia.
Note:
Parentheses denote negative figures
Source:
- BP Statistical Review of World Energy, June 2019

Table 3-4

Evolution of Natural Gas Share of Total Primary Energy Consumption by region, 2015-2018

(%)

	2015	2016	2017	2018
Africa	28.2	26.1	27	27.9
Asia/Pacific	11.6	11.2	11.5	11.9
Central& South America	22.3	21.6	21.2	20.6
Europe&Eurasia*	31.9	31.9	32.4	32.6
Middle East	50.8	50.3	51.4	52.7
North America	31.6	29.6	29.2	31
Total	**24.0**	**23.2**	**23.3**	**23.9**

* CIS , Europe and Turkey represented by Europe & Eurasia.
Note:
Shares of total are calculated in million tonnes oil equivalent figures
Primary energy comprises commercially traded fuels including modern renewables used to generate electricity
Source:
- BP Statistical Review of World Energy, June 2016 , June 2017 , June 2018 and June 2019

Table 3-5
Natural Gas Exports by Region, 2017 and 2018
Billion cubic meter

	2017	2018	(%) of Total	(%)Change 2017/2018
Asia/Pacific	182.2	193.4	15.6	6.1
Of which: Australia	76.6	91.8	7.4	19.8
Brunei	9.1	8.8	0.7	(3.3)
Indonesia	29.7	28.4	2.3	(4.4)
Malaysia	36.1	33.0	2.7	(8.6)
Myanmar	12.7	10.6	0.9	(16.5)
Africa	100.90	102.0	8.2	1.1
Of which: Algeria	53.0	52.4	4.2	(1.1)
Egypt	1.2	2.0	0.2	-
Libya	4.4	4.3	0.3	(2.3)
Nigeria	28.2	27.8	2.2	(1.4)
FSU	298.4	332.0	26.9	11.3
Of which: Russia	231.0	247.9	20.1	7.3
Others	67.50	84.1	6.8	24.6
Middle East	153.6	158.3	12.8	3.1
Of which: Oman	11.40	13.6	1.1	19.3
Iran	12.5	12.1	1.0	(3.2)
Qatar	121.8	125.0	10.1	2.6
UAE	7.7	7.4	0.6	(3.9)
North America	164.0	173.4	14.0	5.7
Of which: Canada	80.7	77.2	6.2	(4.3)
USA	83.4	96.0	7.8	15.1
South America	34.7	35.7	2.9	2.9
of which: Trinidad & Tobago	13.4	16.8	1.4	25.4
Westerm Europe	200.7	241.6	19.5	20.4
Of which: Norway	114.9	120.9	9.8	5.2
Netherlands	44.1	32.5	2.6	(26.3)
Total	**1134.50**	**1236.40**	**100.0**	**9.0**

Source:
- BP Statistical Review of World Energy, June 2018 and June 2019

Table 3-6
World Natural Gas Exports by Region, 2017 and 2018
Billion cubic meter

	2017	(%)	2018	(%)
A- Exports by Pipelines.				
Africa	45.1	6.1	48.0	6.0
Asia/Pacific	26.8	3.6	28.9	3.6
Europe	192.7	26.0	229.7	28.5
FSU	283.0	38.2	307.1	38.1
Middle East	30.9	4.2	32.5	4.0
North America	146.8	19.8	145.0	18.0
South America	15.4	2.1	14.0	1.7
Total World Exports by Pipelines	740.7	100.0	805.4	100.0
B- LNG Exports				
Africa	55.8	14.2	54.0	12.5
Asia/ Pacific	155.4	39.5	164.5	38.2
Europe	8.0	2.0	11.7	2.7
FSU	15.4	3.9	24.9	5.8
Middle East	122.7	31.2	125.8	29.2
North America	17.2	4.4	28.4	6.6
South America	19.3	4.9	21.7	5.0
Total World LNG Exports	**393.8**	**100.0**	**431.0**	**100.0**
Total World Gas Exports	**1134.6**		**1236.4**	
Exports by Pipelines/Total (%)	65.28		65.14	
LNG Exports/Total (%)	34.71		34.86	

Source:
- BP Statistical Review of World Energy, June 2019

Table 3-7

Evolution of World Natrual Gas Prices*, 2018 - 2014

USD / MMBTU

	2014	2015	2016	2017	2018	(%) Change 2013/2014
Japan**	16.33	10.31	6.94	8.10	10.05	24.1
Canada	3.87	2.01	1.55	1.60	1.12	(30.3)
EU	9.11	6.72	4.93	5.62	6.62	17.8
UK	8.25	6.53	4.69	5.80	8.06	39.0
USA	4.35	2.60	2.46	2.96	3.13	5.7

* CIF: Cost+Freight+insurance
**LNG
Source:
- BP Statistical Review of World Energy, June 2019

Table 3-8
Distribution of LNG Nameplate Production Capacity in the world, 2018
(MTPA)

	Nameplate Production Capacity (MTPA)	% of Global Capacity
Atlantic	139	34.5
Of which: Algeria	25.3	6.3
Angola	5.2	1.3
Cameron	2.4	0.6
Egypt	12.2	3.0
Equatorial Guinea	3.7	0.9
Nigeria	21.9	5.4
Norway	4.2	1.0
Russia (Yamal)	16.5	4.1
Trinidad and Tobago	15.3	3.8
USA (Gulf of Mexico)	32.25	8.0
Middle East	99.9	24.8
Of Which: UAE	5.8	1.4
Oman	10.4	2.6
Qatar	77	19.1
Yemen	6.7	1.7
Pacific	164.4	40.8
Of Which: Australia	83.1	20.6
Brunei	7.2	1.8
USA (Alaska)	1.5	0.4
Indonesia	21.1	5.2
Malaysia	30.5	7.6
Perú	4.5	1.1
Papua New Guinea	6.9	1.7
Russia	9.6	2.4
Total	**403.3**	**100.0**

Table 3-9

Distribution of LNG Nameplate Production Capacity in the Arab Countries, 2018

(MTPA)

	Nameplate Capacity MTPA	(%) of Global Capacity
Algeria	25.3	6.3
Egypt	12.2	3.0
Oman	10.4	2.6
Qatar	77	19.1
UAE	5.8	1.4
Yemen	6.7	1.7
Total	**137.4**	**34.1**

Sources:
- GIIGNL ,the LNG industry in 2019
- IGU world LNG report-2019 edition

ORGANIZATION OF ARAB PETROLEUM EXPORTING COUNTRIES
(OAPEC)