Organization of Arab Petroleum Exporting Countries

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ARAB OIL REFINING: REALITY & CHALLENGES

OAPEC COORDINATION MEETINGS IN CAIRO: POSITIVE OUTCOME

ORGANIZATION OF ARAB PETROLEUM EXPORTING COUNTRIES (OAPEC)

The Organization of Arab Petroleum Exporting Countries (OAPEC) was founded on the basis of the agreement signed in Beirut, Lebanon on 9 January 1968 between the governments of Kingdom of Saudi Arabia, the State of Kuwait and the (then) Kingdom of Libya. The agreement stipulates that the Organization shall be domiciled in the City of Kuwait.

The principal objective of the Organization is the cooperation of the members in various forms of economic activity in the petroleum industry, the determination of ways and means of safeguarding the legitimate interests of its member countries in this industry, individually and collectively, the unification of efforts to ensure the flow of petroleum to its markets on equitable and reasonable terms, and providing appropriate environment for investment in the petroleum industry in member countries.

In 1970 the United Arab Emirates, the State of Qatar, the Kingdom of Bahrain and the Republic of Algeria joined the Organization, followed by the Syrian Arab Republic and the Republic of Iraq in 1972, Arab Republic of Egypt in 1973, then the Republic of Tunisia in 1982 (its membership was suspended in 1986). Any Arab country which derives a significant share of its national income from petroleum is eligible for membership in OAPEC upon the approval of three-quarters of the member countries, including all three founding members.

- **OAPEC-Sponsored Ventures:** OAPEC has sponsored the creation of four companies: The Arab Maritime Petroleum Transport Company (AMPTC), established in 1972 with headquarters in Kuwait City, the Arab Shipbuilding and Repair Yard Company (ASRY) established in 1973 with headquarters in Bahrain, the Arab Petroleum Investments Corporation (APICORP) established in 1974 with headquarters in Khobar, Saudi Arabia, the Arab Petroleum Services Company (APSC) established in 1975 with headquarters in Tripoli, Libya.

OAPEC'S ORGANS

The Organization carries out its activities through its four organs:

- **Ministerial Council:** The Ministerial Council is the supreme authority of the Organization, responsible for drawing up its general policy.
- **Executive Bureau:** The Executive Bureau is composed of one representative from each of the member countries, drawing recommendations and suggestions to the Council, reviewing the Organization's draft annual budget and submitting it to the Council, it also adopts the regulations applicable to the staff of the General Secretariat. The resolutions of the Executive Bureau are issued by the majority of two- thirds of all members.
- **General Secretariat:** The General Secretariat of OAPEC plans, administers, and executes the Organization's activities in accordance with the objectives stated in the agreement and directives of the Ministerial Council. The General Secretariat is headed by the Secretary General. The Secretary General is appointed by resolution of the Ministerial Council for a tenor of three years renewable for similar period(s). The Secretary General is the official spokesman and legal representative of the Organization and is accountable to the Council.

  The Secretary General directs the Secretariat and supervises all aspects of its activities, and is responsible for the tasks and duties as directed by the Ministerial Council. The Secretary General and all personnel of the Secretariat carry out their duties in full independence and in the common interests of the Organization member countries. The Secretary General and the Assistant Secretaries General possess in the territories of the Organization members all diplomatic immunities and privileges.
- **Judicial Tribunal:** The protocol of the Judicial Tribunal was signed in Kuwait on 9 May 1978 and came into effect on 20 April 1980. The Tribunal is competent to consider all disputes related to the interpretation and application of OAPEC's establishment agreement, as well as disputes arising between two or more member countries concerning petroleum operations.

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ARAB OIL REFINING: REALITY & CHALLENGES

A recent study prepared by OAPEC Secretariat General concluded that the oil refining industry has witnessed a quality transformation in the past five years through some member countries' plans to build new refineries and upgrade existing ones. This is due to the vital role played by the oil refining industry in meeting domestic market needs of petroleum products, which contributes to securing more financial revenues for the member countries.

The study indicated that the total refining capacity in OAPEC countries has reached 8.35 million b/d in 2016 92% of the total refining capacity of Arab countries. There are 52 refineries in these countries.

The researcher estimated an increase of over 11 million b/d in OAPEC members' refining capacity in the next 5 years. The study also suggested that the number of refineries would reach 64 in 2020, and that there would be a surplus of petroleum exports to foreign markets until 2030.

It stressed that many projects have been executed at Arab refineries. These projects aim at observing environmental legislations on curbing pollutants resulting from refining operations by using technologies and taking measures; including reducing the use of heavy oil containing high rates of pollutants and replacing it with sulphur-free natural gas. This is in addition to implementing flare gas recovery projects as well as energy conservation policies and efficiency systems.

The researcher classified the goals of such projects in OAPEC members into two groups: firstly; technical goals linked to upgrading refineries' capacity to face operational difficulties that weaken production, secondly; a group of goals relevant to supporting national economies.

The study reviewed challenges facing the refining industry in the Arab countries in general, covering OAPEC members too. The challenges included: aging and waring equipment in some refineries that were built over 50 years ago; the low refining capacity of some small refineries that have been built to meet certain areas' needs of petroleum products, which

led to having a large number of small refineries with a capacity of no more than 100 thousand b/d. These small refineries constitute about half the number of the existing refineries in the Arab countries.

Refining in the Arab countries suffers from many other difficulties and challenges in terms of the level of operational performance, the ability to keep in pace with international environmental standards, discrepancies between production structure and demand rates in domestic markets, weak maintenance programmes, and relying on importing basic equipment from external markets.

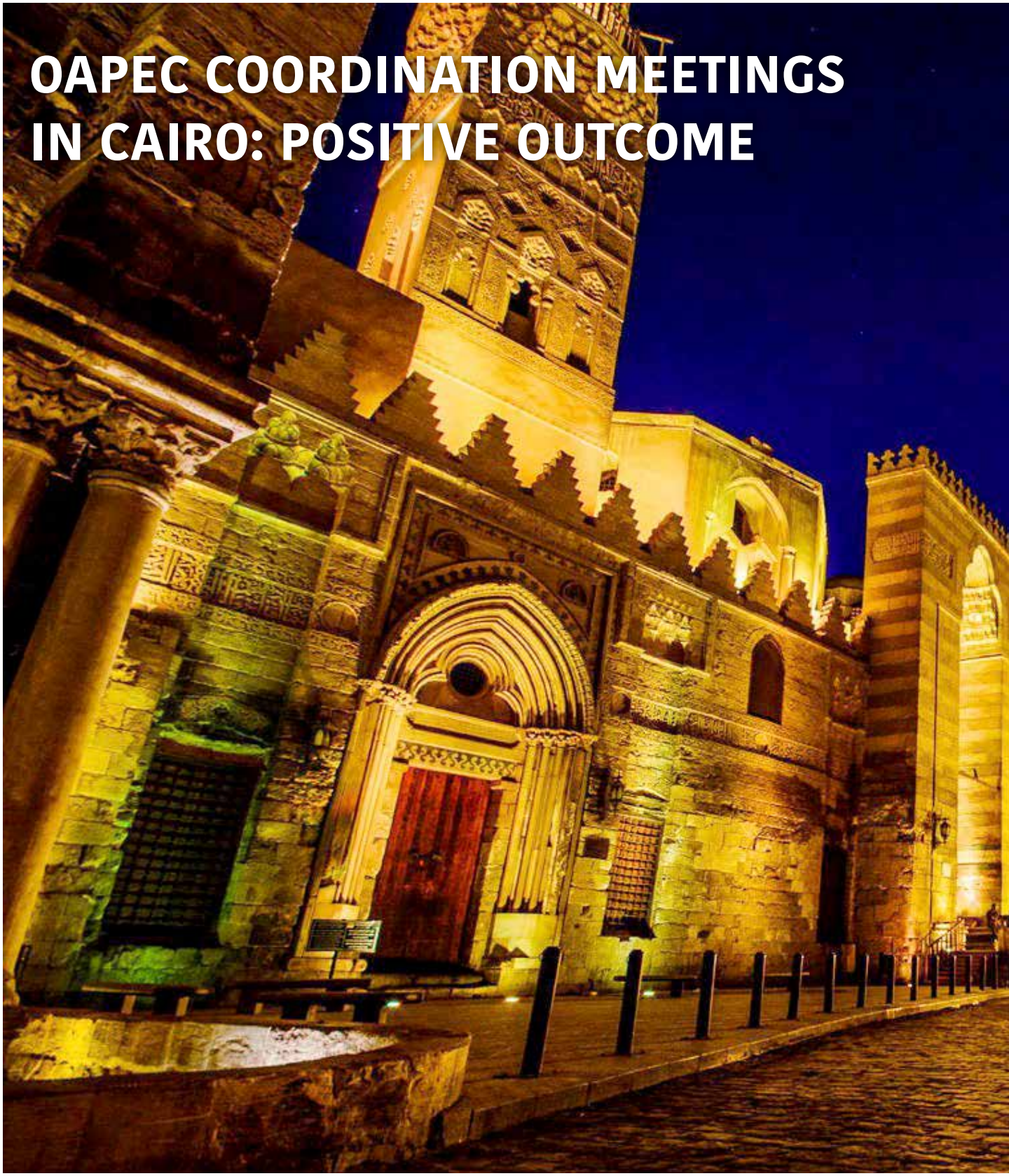
The study explained that these difficulties represent a challenge to decision-makers as a critical situation that calls for grilling might arise in case of a project's failure to meet its targets. In spite of all the efforts, accelerating developments in the refining industry- both locally and externally- make this mission more difficult.

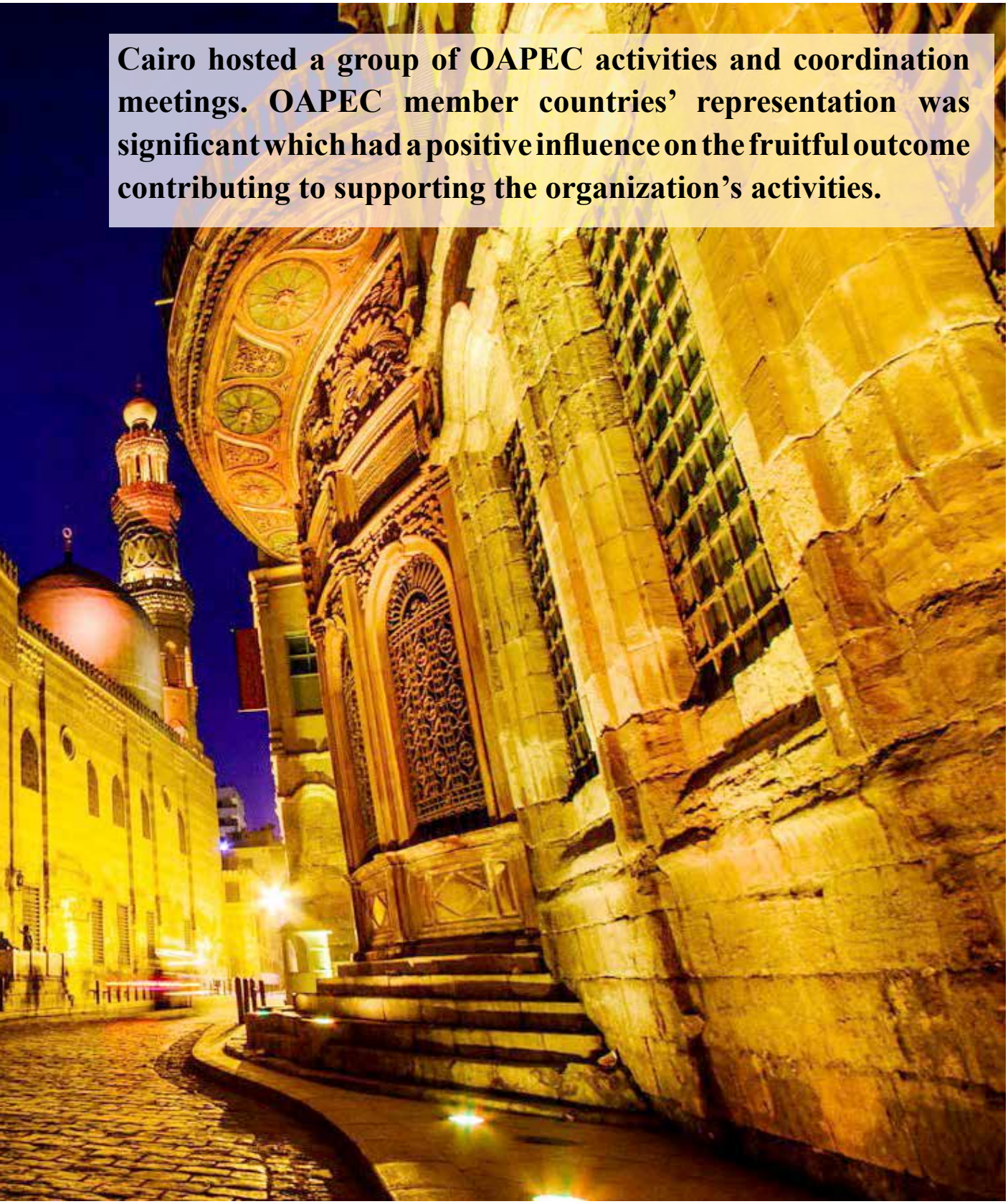
In order to face these challenges, Arab countries have taken various measures including: boosting scientific research on improving the performance and efficiency of refining operations; conducting technical, statistical and economic feasibility studies in order to provide information that helps predicting potential risks and their impact on project revenues. This is in addition to boosting cooperation with global oil companies and foreign investors in refinery rehabilitation and upgrading projects.

The study's final conclusions recommended that Arab countries continue their refineries upgrading projects, seek methods to meet the growing LNG demand through giving attention to investing in natural gas fields and developing associated gas processing and flare gas recovery projects. The study also recommended boosting cooperation between national and private refining companies on the one hand, and Arab and global companies on the other hand. This is in addition to improving the flexibility of refineries to process heavy and highly-sulfuric acid oils.

OAPEC Secretariat General has prepared this study as part of its sincere efforts to follow up and monitor Arab and international petroleum-relevant issues including oil refining under the umbrella of its endeavours to boost cooperation and coordination between member countries, and identify economic and investment cooperation and opportunities available at the member countries' petroleum sector. OAPEC believes that the ideal economic exploitation of the petroleum resources is basically linked to creating the appropriate conditions for quality management and operation, as well as, good planning for the future.

OAPEC COORDINATION MEETINGS IN CAIRO: POSITIVE OUTCOME





Cairo hosted a group of OAPEC activities and coordination meetings. OAPEC member countries' representation was significant which had a positive influence on the fruitful outcome contributing to supporting the organization's activities.

148TH OAPEC EXECUTIVE BUREAU MEETING

OAPEC Executive Bureau held its 148th meeting in Cairo, Egypt on 6-7 October 2017, chaired by HE Ashraf Faraj, Egypt's Representative at the Executive Bureau. Their Excellencies Executive Bureau members attended the meeting.

His Excellency the Chairman opened the meeting welcoming Their Excellencies the members of the Executive Bureau and wishing them a pleasant stay in Egypt. His Excellency the Chairman extended thanks to Egypt for the hospitality and warm welcome. He also thanked OAPEC Secretariat General for arranging the meeting.

On his part, OAPEC Secretary General HE Abbas Ali Al Naqi welcomed the conveners wishing them a pleasant stay in Egypt. He thanked Egypt for hosting the Organization's meetings while wishing success for this event.

The main discussion points on the agenda were OAPEC's 2018 projected budget (Secretariat General and Judicial Tribunal) and its activities in 2017.

H.E. Mohammed Ras El Kaff
ALGERIA

H.E. Fyhan M. AL Fihany
BAHRAIN

H.E. Geologist Ashraf Mahmoud Mohammad Faraj
EGYPT

H.E. Safa'a Abdul Rahman Ahmed
IRAQ

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H. E. Mr. Mohamed Al-Subaie
QATAR

H.E.Eng. Nasser Bin Ibrahim Al Fawzan
KSA

H.E.Eng. Abdullah Al Khattab
SYRIA

H.E. Dr. Mattar Al Neyadi
UAE

FAREWELL CEREMONY HONOURING LEAVING EXECUTIVE BUREAU MEMBERS

OAPEC Secretariat General held a farewell ceremony on the side-lines of the meeting for leaving Executive Bureau members on 6 October 2017, honouring: Bahrain's Representative HE Al Al Sawad; Iraq's Representative HE Hassan Al Rufai'e; and Egypt's Representative HE Jamal Hijazi. OAPEC Secretary General HE Abbas Ali Al Naqi addressed the audience expressing thanks and great appreciation to Their Excellencies while wishing them all success for their future. A number of the Bureau Representatives took the opportunity to deliver farewell speeches on the occasion.

THE 17TH MEETING OF EXPERTS ON

NATURAL GAS INVESTMENT COOPERATION POTENTIALS IN OAPEC MEMBER COUNTRIES

The 17th Meeting of Experts on Natural Gas Investment Cooperation Potentials in OAPEC Member Countries took place on 9 and 10 October 2017 in Cairo, Egypt. The meeting was attended by 13 experts from OAPEC member countries as follows: Bahrain (2), Algeria (1), KSA (1), Iraq (2), Kuwait (5), Egypt (2) in addition to the Secretariat General's delegation (4).

OAPEC Secretary General HE Abbas Ali Al Naqi opened the meeting with a speech welcoming the participants and stressing the Secretariat General's keenness on following up Arab and international developments in the natural gas industry. This keenness stems from OAPEC's belief in natural gas' growing importance in the energy mix and achieving sustainable development in the Arab countries.

HE Al Naqi reviewed some of the important indicators in the industry during 2016, which witnessed growing global demand for natural gas by about 1.5%: (Europe 6.5%), the Middle East (3.5%), and China (7.7%).

As for the global natural gas trade (both LNG and via pipelines), HE Al Naqi explained that it registered a growth of 4.8% in 2016 due to a growth in pipeline gas exports by 6.5%, and LNG exports by 6.5% too. As for Arab countries, natural gas exports have flourished again in 2016 following a drop that lasted for three years. The growth rate was 3.5% during that year.

He concluded the speech by wishing the participants a pleasant stay in Egypt and all success in realizing the goals of their meeting.

Following that, the Director of the Technical Affairs Department Dr Samir Al Qara'ish chaired the proceedings of the meetings. Day 1 included 2 sessions: session 1 focused on the Secretariat General's report on the most important natural gas developments

in the member countries. Eng. Wa'el Hamid, Gas Industry Expert, Technical Department, presented the report which showed the Secretariat General's efforts and activities, both regionally and internationally, since the last meeting, as well as, the outcome of the relevant studies prepared by the Secretariat General.

The participants gave presentations on the developments of the natural gas industry in their respective countries which ignited extensive discussions and constructive inquiries.

Day 2 was allocated for a field visit to Khalda Petroleum Company in Cairo to explore its activities in developing oil and gas fields, current challenges, and future plans.

Among the most important findings of the meeting:

- Papers presented to the meeting discussed the increasing attention given to natural gas; executing projects to raise production rates; and securing future gas demand.
- The importance of boosting bilateral or multilateral cooperation among member countries in natural gas exploration, development, and marketing. In addition to making use of the available infrastructure to serve the joint interests and intra-trade activities.
- Appreciating the proposal on linking the GCC natural gas network. The meeting hoped that the proposal would materialize to achieve integration between the region's countries.
- The Secretariat General is looking for more achievements in the light of the data provided by the member countries and in Arab, regional, and international meetings and periodicals.
- The participants requested the Secretariat General to provide them with its publications (studies and reports) on the natural gas industry and its developments in the world markets.
- The participants lauded the Secretariat General's efforts in organizing such meetings and its keenness on creating the appropriate atmosphere for exchanging knowledge and expertise between OAPEC natural gas specialists.

Organization of Arab Petroleum Exporting Countries

OAPEC

24TH 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), the 24th Coordination Meeting of OAPEC Environment and Climate Change Experts took place in Cairo, Egypt, on 10 and 11 October 2017 with the participation of experts from Bahrain, KSA, Kuwait, Egypt, and Iraq, in addition to representatives from the GCC Council, the Arab Negotiating Group and a delegation from OAPEC Secretariat General.

OAPEC **Secretary General HE Abbas Ali Al Naqi** opened the meeting welcoming the participants and reiterating the Arab principles in terms of transparency, comprehensiveness, and conformity to the basic principles of the Paris Agreement, its clauses, and methods of implementation beyond 2020. This is in addition to striking a balance between the various



components of the agreement, resuming negotiations, providing funding to developing countries to meet their obligations with regards to submitting their reports, as well as, agreeing a group of resolutions by 2018. HE Al Naqi congratulated Egypt for chairing the G77+ China in 2018.

Mr Abdul Kareem Ayed, Information and Library Department Director, presented a paper on the "Official Course of the Climate Change Negotiations" during May 2017 round, their outcome and resolutions. He gave a thorough explanation on OAPEC's role in climate change and Paris Agreement 2015 issues, whether locally, regionally, or internationally.

The Head of the Arab Negotiating Group Mr Ayman Shasly from Saudi Arabia, gave a detailed explanation on the efforts of the Arab Negotiating Team that is following up the Paris 2015 Agreement and the recommendations on coordinating the Arab countries' stances to safeguard Arab oil interests.


A joint workshop between OAPEC, the Arab Negotiating Group, ESCWA, and the Arab League was held on the second day. OAPEC's representative Mr Abdul Kareem Ayed presented a paper on the "Impact of the Paris Climate Change Agreement on the Arab Oil Sector". Also, Bahrain's representative Mr Hussein Makki presented a technical paper on the "Impact of Responsive Measures on the Oil Industry in the Arab Countries".

Following are some of the most important recommendations of the meeting:

- OAPEC and the member countries should seek to organize an event on the responsive measures at the next COP-24 in Poland in 2018.
- A mechanism should be agreed to face the measures taken by the industrialized countries, international organizations and financial bodies with regards to climate change, especially those with direct impact on the Arab oil and gas industry.
- Comply with the Arab Negotiating Group's guidelines on mitigation, adaptation, and transparency.

OAPEC JOINT VENTURES' 46TH COORDINATION MEETING

On 12 October 2016, OAPEC Secretariat General held the 46th Coordination Meeting for OAPEC Joint Ventures in Cairo, Egypt. The meeting was chaired by HE Abbas Ali Al Naqi, OAPEC Secretary General; and it was attended by the joint ventures' CEOs and GMs as representatives of their companies.

The meeting aimed at highlighting the activities, and the financial and operational

results of the joint ventures during 2016 and the first half of 2017. Cooperation, collaboration, and challenges facing these companies were also discussed. A Minutes of Meeting report will be then submitted to the next OAPEC Ministerial Council's meeting in December 2017.

The revision of the joint ventures' activities in 2016 and the first half of 2017 showed that despite the difficult conditions facing a number of these companies, they managed to achieve good operational and financial results.

6TH COORDINATING MEETING FOR OAPEC DATABANK LIAISON OFFICERS

OAPEC Secretariat General held its Sixth Coordinating Meeting for OAPEC Databank Liaison Officers on 1 and 2 October 2017 at the organization's headquarters in Kuwait. The meeting was attended by eight liaison officers from: Algeria, KSA, Qatar, Kuwait, and Egypt.

The meeting 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 system's earlier stages technical gaps and statistical shortages; as well as, hearing remarks and future visualizations on developing the system's application to meet the member countries' needs of energy and oil-related data.

The meeting recommended 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.

THE PEOPLES' FRIENDSHIP UNIVERSITY OF RUSSIA VISITS OAPEC

OAPEC Secretary General HE Abbas Al Naqi received in his office a delegation from The Peoples' Friendship University of Russia on 18 October 2017. The delegation was headed by Dr Irena Aidarous, International Economic Relations Professor, and included specialists and postgraduate students at the International Economic Relations College in Russia. The visit is part of the visiting delegation's scientific tour in Kuwait.

During the visit, the delegation was informed about the goals and activities of OAPEC through the Secretary General's speech and a presentation by the Director of the Technical Affairs Dr Samir Al Qara'esh. This was followed by a tour in the building of the Arab Organizations, which has a unique architecture.

18TH ABU DHABI INTERNATIONAL DOWNSTREAM SUMMIT

OAPEC Secretariat General took part in the **"18th Abu Dhabi International Downstream Summit"** in Abu Dhabi, UAE on 18 and 19 September 2017. About 350 experts and leaders from the UAE, KSA, Kuwait, Oman, and Bahrain, as well as, Arab and international oil companies like ADNOC, ENOC, TAKREER, ARAMCO, SABIC, EQUATE, KNPC, Borouge, Borealis, and Shell, participated in the event.

The annual summit provides a platform to discuss regional and global challenges facing the downstream industry (refining and petrochemicals). Different views and expertise are exchanged to contribute to forming new ideas and creative solutions for problems facing the industry.

A number of important strategic issues have been discussed in the summit including:

- Reality and future of the refining and petrochemicals industry in the UAE until 2030
- Regional and global challenges facing the industry
- Integrating research and development techniques to generate revenues for companies and institutions
- Boosting regional cooperation
- The role of women in downstream industries
- Safety, occupational health, efficiency, and environment

The Secretariat General, represented by the Technical Affairs Director Dr Samir Al Qara'esh, presented a paper tackling OAPEC members' strategies to improve the operational performance of the refineries and their profitability.

UAE'S MINISTRY OF ENERGY LAUNCHES THE ANNUAL STATISTICAL REPORT 2016

The UAE's Ministry of Energy has released the new version of the 2016 Energy and Water Statistical Yearbook, which provides accurate and documented data for the UAE's energy and water sector, which is a reference for decision-makers and stakeholders.

HE Eng. Suhail Mohammed Al Mazrouei, Minister of Energy, said that the annual statistical report is a reference for specialists because of the importance of data in developing, reviewing and measuring strategies and decision-making. The Ministry is keen to provide accurate and documented data on energy and water to become a reference for policy makers and decision-makers to ensure the effective contribution of these vital sectors, and for looking ahead to the future to promote sustainable economic development.

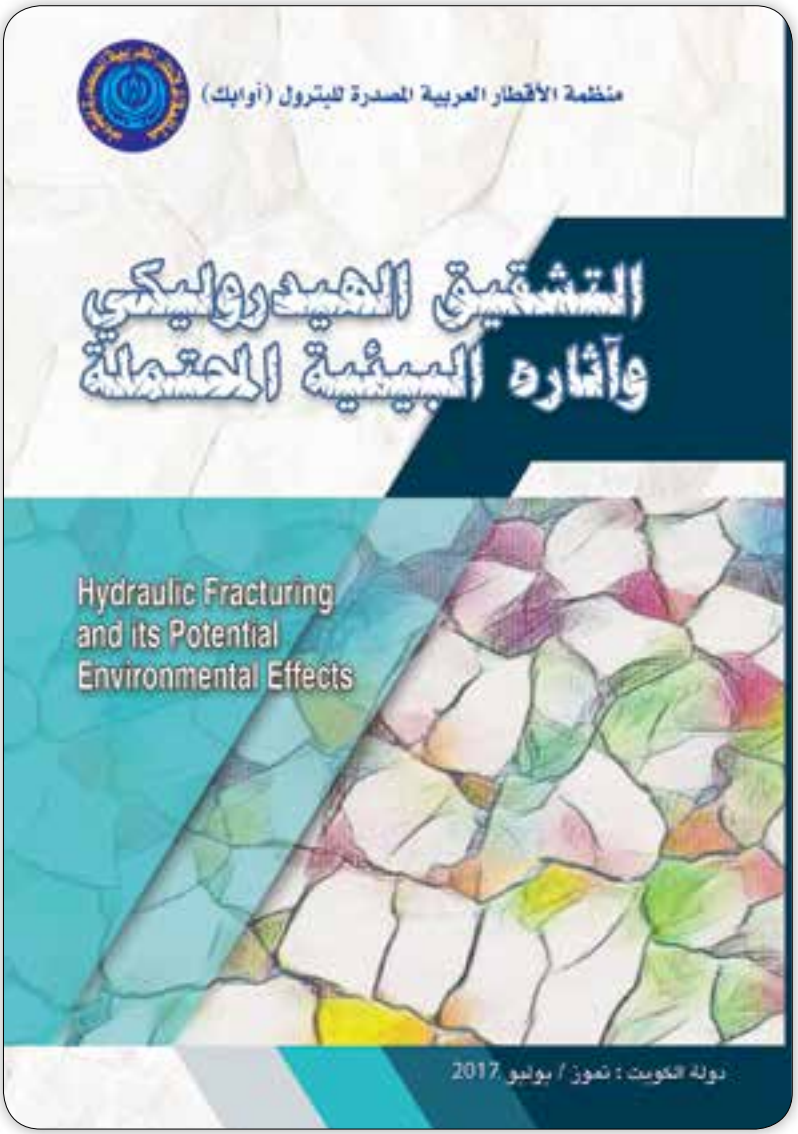
For his part, Dr. Matar Al Neyadi, the Undersecretary of the Ministry/ the UAE's Representative at OAPEC Executive Bureau, thanked all national institutions working in the energy and water sector for their cooperation in the exchange of information, which will enhance the competitiveness of the country in global indicators.

HE Al Neyadi said that the annual report prepared by the Ministry in cooperation with various local and federal authorities in the UAE provides data on crude oil, natural gas, petroleum products, petrochemicals, total production of refineries in the country, and the number of workers in the petroleum sector. The report also provides data on the electricity produced in UAE, and data of clean energy, maximum load, number of subscribers and electricity tariff in the UAE.

He pointed out that the report includes data on the production capacity of the desalination plants in UAE, the quantity of water consumed, the number of subscribers in the country, the number of dams and their distribution in the country, and the storage capacity of the dams. The report uses graphs to help track the general trend of the most important indicators of the mentioned data.

It is noteworthy that the Ministry of Energy published an electronic version of the annual report of energy and water statistics 2016 on its website www.moenr.gov.ae, and in its accounts in social networking sites in order to disseminate knowledge, data and statistics among all members of the community. http://bit.ly/2ylmj9M

HYDRAULIC FRACTURING AND ITS POTENTIAL ENVIRONMENTAL EFFECTS



Hydraulic Fracturing (HF) is a longstanding technique emerged in the early 1940s, it was soon adopted to develop oil and gas wells in many countries.

Recently, HF gained much focus after its wide use in tight oil and gas fields. Acid jobs in the 1930s may have been the cause behind using HF, as operators noticed that when injecting acid at high pressure, the reservoir acceptability eventually increases. Thus, it is believed that early acid jobs were also indirect fracturing jobs. However, the first recorded direct HF job took place in 1947 in Hugoton gas field, West Kansas, USA.

Some authors use the term Breaking or Cracking to denote the same technique, but fracturing is more accurate terminology as HF doesn't break or crack the rock, it rather creates tiny fissures or enlarges the microscopic existing ones to diameters that mostly don't exceed 1 mm.

Simply speaking, HF is a process to inject a fluid (mostly water with other additives) at high pressure in a low permeability formation to create/ enlarge fractures, this allows trapped oil and/or gas to flow towards the well bore. In other words, HF is an act of increasing the area of rocks linked to the well. Accordingly, the importance of HF stems from a simple idea: a highly porous reservoir with reasonable volume of hydrocarbons, but the permeability is too low to allow the hydrocarbons to move, therefore the reservoir

rocks must be fractured to allow the fluids to move.

As a rule of thumb, a gas reservoir with less than 1 millidarcy and an oil reservoir with less than 10 millidarcy must be stimulated. Carbonate rocks permeability ranges between 0.1- 1 millidarcy, while permeability of shale reservoir could be as low as 10^{-4} to 10^{-6} millidarcy.

Rapid advances in exploration and drilling techniques have contributed to a very large number of conventional oil discoveries, the rise in conventional oil prices has contributed to the re- evaluation of resources that were once considered out of economic viability.

This study has focused on USA experience to show the effectiveness, results and consequences of HF. USA was taken as an example because of the numerous number of wells fractured in different basins which has led to an obvious change in the USA oil production trend line, this in turn has influenced the global oil markets.

It concluded that HF needs large amounts of water that could reach 400 thousand barrels per well. Due to the obvious decline in shale oil/ gas wells production, re-fracking and/ or drilling mean more water requirements. It showed that using HF in very deep formations is still out of reach of current technologies.

A variety of chemicals are used in HF fluids. Although the proportion of chemicals is usually small (about 0.5%), the large amount of water means that the amount of chemicals used is also high. Companies often keep the names of the materials used in the HF processes as a commercial secret, this has made public opinion in many countries stands against HF.

Many studies have shown that HF fluids if leaked into groundwater or surface water, might form a potentially serious hazard to the environment, and can contaminate the soil in case of spillage. However, it is a fact that most if not all other industries have the same risk factor.

It is unreasonable and not possible to ignore the environmental impact of oil and gas production in general and HF in particular, but it is also unreasonable to exaggerate these effects as if hydraulic operations are solely responsible for all damage to the environment. It is therefore necessary to emphasize that each industrial process has its side effects, the logical and sustainable response is to try to reconcile the extent to which human societies need this process and to minimize such potential effects.

In practical terms, it is not possible to define a pinch mark that reflects the cost of HF. The cost of water sources, infrastructure, equipment, expertise, taxation, energy costs, etc., are different from one place to another within the United States of America, and within the rest of the world. However, it is possible to draw attention to a fiscal range that reflects the share of the costs of HF compared to the costs of the total drilling.

This study through the examined examples showed that the cost of the HF in general ranges from 45 to 62% of the total cost of the well.

Petroleum Developments in the World Market and Member Countries*

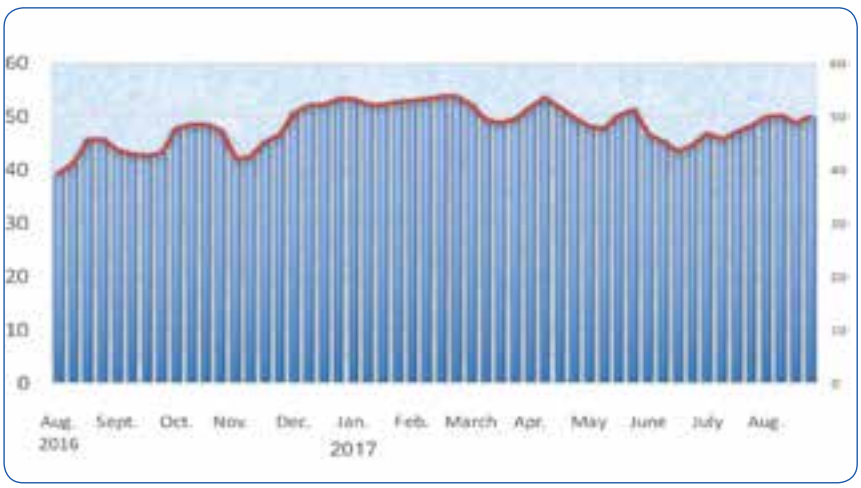
1. Oil Market

1. Prices

1-1Crude Oil Prices

Weekly average price of OPEC basket increased during the first week of August 2017, to reach $49.9/bbl, and continued to raise thereafter, to reach its highest level of $50.2/bbl during the second week. During the third week, weekly average price decreased to $48.7/bbl, and increased thereafter to $49.7/bbl during the fourth week, as shown in **figure 1**:

Figure - 1 Weekly Average Spot Price of the OPEC Basket of Crudes 2016 - 2017 ($/bbl)



On monthly basis, OPEC Reference Basket in August 2017, averaged $49.6/bbl, representing an increase of $2.7/bbl or 5.8% comparing with previous month, and an increase of $6.5/bbl or 15.1% from the same month of previous year. OPEC and non-OPEC countries continued to conform with voluntary output adjustments, strong demand, and US stocks decline, were major stimulus for the increase in oil prices during the month of August 2017.

Key Indicators

- *In August 2017,* ***OPEC Reference Basket increased*** *by 5.8% or $2.7/bbl from the previous month level to stand at $49.6/bbl.*
- ***World oil demand*** *in August 2017,* ***increased*** *by 1% or 1 million b/d from the previous month level to reach 99.9 million b/d.*
- ***World oil supplies*** *in August 2017,* ***decreased*** *by 0.1% or 0.1 million b/d from the previous month level to reach99.5 million b/d.*
- ***US tight oil production*** *in August 2017,* ***increased*** *by 1.9% to reach about 5.9 million b/d, whereas* ***US oil rig count decreased*** *by one rig from the previous month level to stand at 814 rig.*
- ***US crude oil imports*** *in July 2017,* ***increased*** *by 0.8% from the previous month level to reach 8 million b/d, whereas* ***US product imports decreased*** by *5.7% to reach about 1.9 million b/d.*
- ***OECD commercial inventories*** *in July 2017* ***increased*** *by* 1 *million barrels from the previous month level to reach 3017 million barrels*, and **Strategic inventories** in OECD-34, South Africa and China ***increased*** *by* one *million barrels from the previous month level to reach 1869 million barrels.*
- ***The average spot price of natural gas*** *at the Henry Hub in August 2017* ***decreased*** *by $0.08/million BTU comparing with the previous month level to reach $2.90/million BTU.*
- ***The Price of Japanese LNG imports*** *in July 2017* ***decreased*** *by $0.01/m BTU to reach $8.3/m BTU. Whereas the* ***Price of Chinese LNG imports increased*** *by $0.2/m BTU to reach $7.4/m BTU, and* ***the Price of Korean LNG imports increased*** *by $0.02/m BTU to reach $7.9/m BTU.*
- ***Arab LNG exports to Japan, Korea and China*** *were about 3.073 million tons in July 2017 (a share of 24.3% of total imports).*

* Prepared by the Economics Department.

Table (1) and **figure (2)** show the change in the price of the OPEC basket versus last month and the corresponding month of last year:

Table 1 **Change in Price of the OPEC Basket of Crudes, 2016-2017** ($/bbl)

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan. 2017	Feb.	Mar.	Apr.	May.	June	July	Aug.
OPEC Basket Price	43.1	42.9	47.9	43.2	51.7	42.4	53.4	50.3	51.4	49.2	45.2	46.9	49.6
Chamge From previous Month	0.4	-0.2	5.0	-4.7	8.5	0.7	1.0	-3.1	1.1	-2.2	-4.0	1.7	2.7
Change from same month of previous Year	-2.4	-1.9	2.8	2.7	18.1	25.9	24.7	15.7	13.5	6.0	-0.6	4.2	6.5

* Effective June 16,2005 OPEC replaced its seven-crude basket with one comprised of eleven crudes, one from each member country (weighted according to production and exports to major markets). Effective 1 January and mid of October 2007, Angola's Girassol and Ecuadorian Oriente crudes have been incorporated to become the 12th and 13th crudes comprising the new OPEC Basket. As of Jan.2009, the basket excludes the Indonesian crude. As of Jan. 2016, the basket price includes the Indonesian crude. As of July 2016, the basket price includes the Gabonese crude. As of Jan. 2017, the basket excludes the Indonesian crude. As of June 2017 the basket price includes the Equatorial Guinean crude "Zafiro".

Figure - 2 **Change in the Price of the OPEC Basket of Crudes, 2016-2017** ($/bbl)

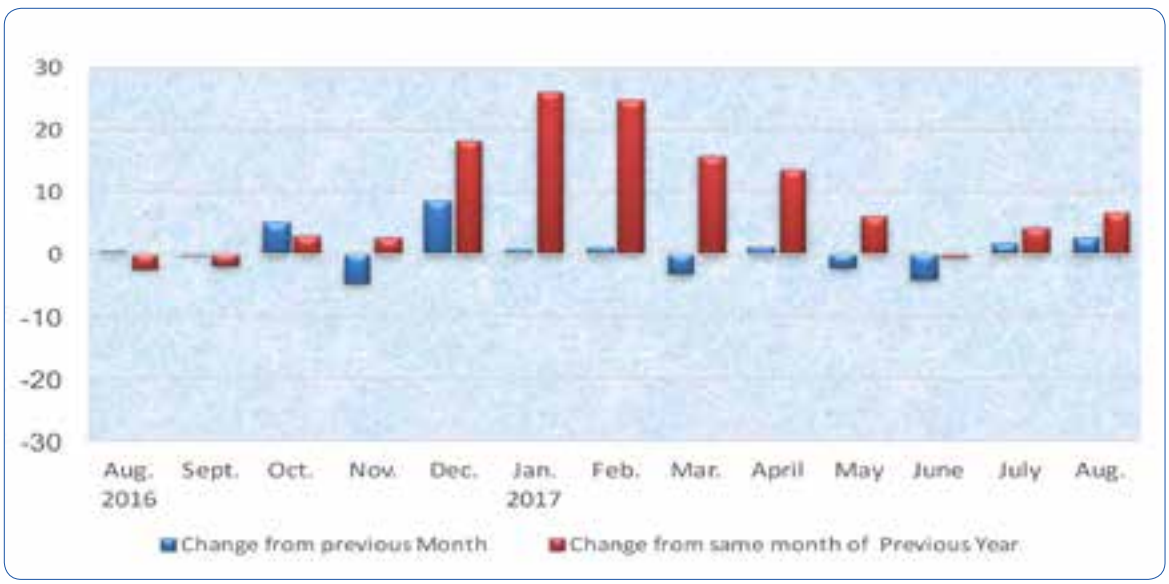


Table (3) in the annex show spot prices for OPEC basket and other crudes for the period 2015-2017.

1-2 Spot Prices of Petroleum Products

- **US Gulf**

  In August 2017, the spot prices of premium gasoline increased by 7.3% or $5.2/bbl comparing with their previous month levels to reach $76.4/bbl, spot prices of gas oil increased by 6.4% or $3.6/bbl to reach $60/bbl, and spot prices of fuel oil increased by 2.9% or $1.3/bbl to reach $45.8/bbl.

- Rotterdam

The spot prices of premium gasoline increased in August 2017, by 7% or $4.9/bbl comparing with previous month levels to reach $75.2/bbl, spot prices of gas oil increased by 6.2% or $3.8/bbl to reach $64.7/bbl, and spot prices of fuel oil increased by 3.6% or $1.6/bbl to reach $46.6/bbl.

- Mediterranean

The spot prices of premium gasoline increased in August 2017, by 9.3% or $5.7/bbl comparing with previous month levels to reach $66.9/bbl, spot prices of gas oil increased by 5.5% or $3.4/bbl to reach $65.5/bbl, and spot prices of fuel oil increased by 2.9% or $1.3/bbl to reach $46.7 bbl.

- Singapore

The spot prices of premium gasoline increased in August 2017, by 9.2% or $5.7/bbl comparing with previous month levels to reach $67.5/bbl, spot prices of gas oil increased by 4.6% or $2.8/bbl to reach $64.2bbl, and spot prices of fuel oil increased by 2.4% or $1.1/bbl to reach $47.2/bbl.

Figure (3) shows the price of Premium gasoline in all four markets from August 2016 to August 2017.

Figure - 3 **Monthly Average Spot Prices of Premium Gasoline, 2016-2017** ($/bbl)

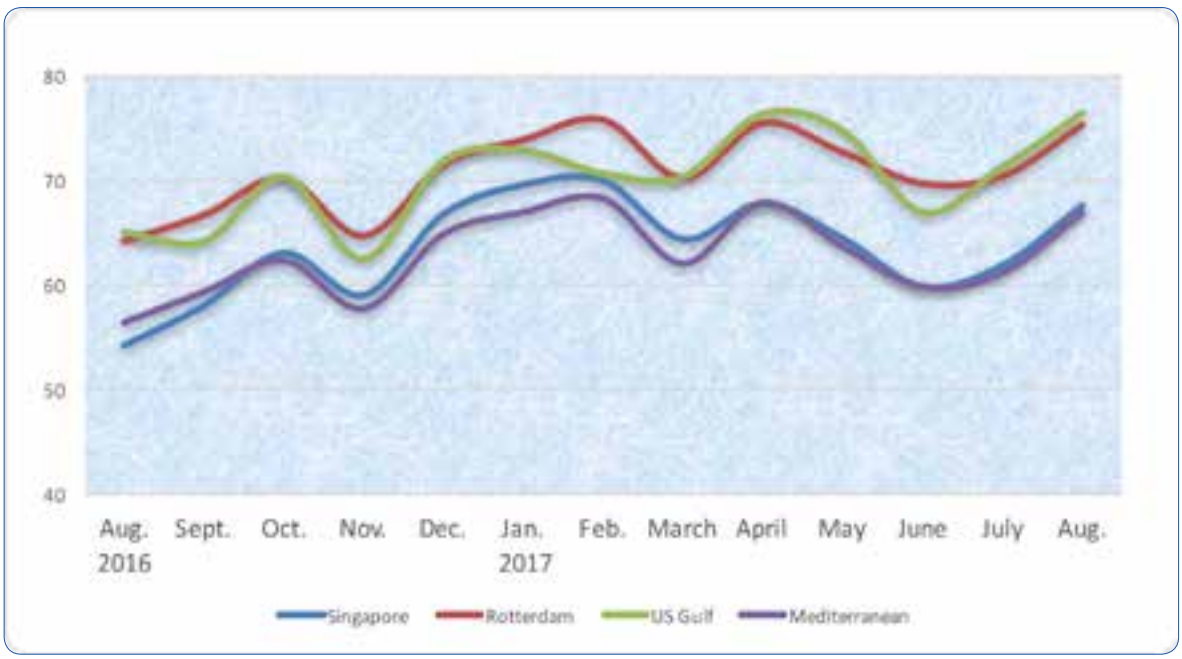


Table (4) in the annex shows the average monthly spot prices of petroleum products, 2015-2017.

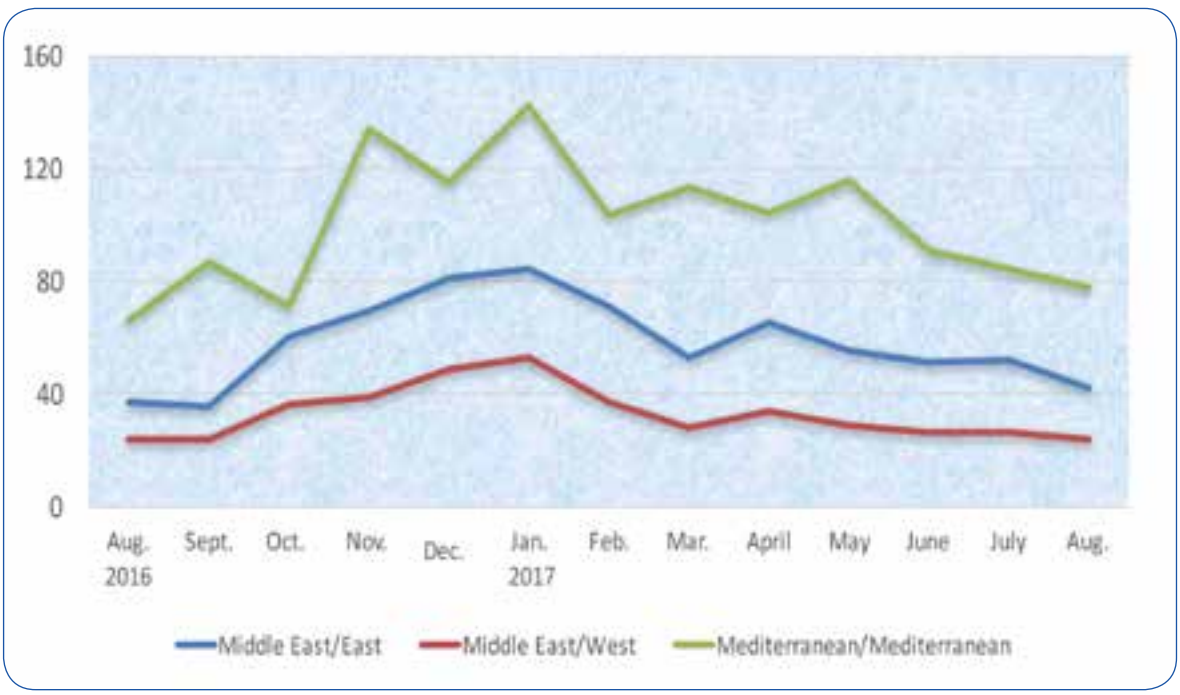
1-3 Spot Tanker Crude Freight Rates

In August 2017, Freight rates for crude oil for tanker size (230-280 thousand deadweight tons (dwt)), leaving Middle Eastern ports to the East, decreased by 10 points or 19.2% comparing with previous month to reach 42 points on the World Scale (WS*), freight rates for crude oil for tanker size (270-285 thousand deadweight tons (dwt)), leaving Middle Eastern ports to the West, decreased by 2 points or 7.7% comparing with previous month to reach 24 points on the World Scale (WS).

And freight rates for inter - Mediterranean for small to medium sized tankers (80-85 thousand deadweight tons (dwt)), decreased by 6 points or 7.1% comparing with previous month to reach 78 points on the World Scale (WS).

Figure (4) shows the freight rates for crude oil to all three destinations from August 2016 to August 2017.

Figure - 4 **Monthly Spot Crude Oil Tanker Freight Rates, 2016 -2017** (World Scale)*



* World Scale is a method for calculating freight prices. One point for the WS means 1% of the standard price of freight in the direction in the WS book, which is published annually by the World Scale Association. The book contains a list of prices in the form of US dollar per ton, called "World Scale 100," for all the major routes in the world.

1-4 Spot Tanker Product Freight Rates

In August 2017, monthly spot Tanker freight rates for petroleum products [for tanker size 30-35 thousand deadweight tons (dwt)], leaving Middle Eastern ports to the East, increased by 13 points, or 11.4% comparing with previous month to reach 127 points on WS.

Freight rates for Petroleum Products across Mediterranean [for tanker size 30-35 thousand deadweight tons (dwt)], decreased by 15 points, or 11.3% to reach 118 points on WS, and freight rates for petroleum products [for tanker size 30-35 thousand deadweight tons (dwt)], leaving Mediterranean to North-West Europe decreased by 16 points, or 11.2% to reach 127 points on WS.

Figure (5) shows the freight rates for oil products to all three destinations from August 2016 to August 2017.

Figure - 5 **Monthly Spot Product Tanker Freight Rates, 2016 -2017** (World Scale)

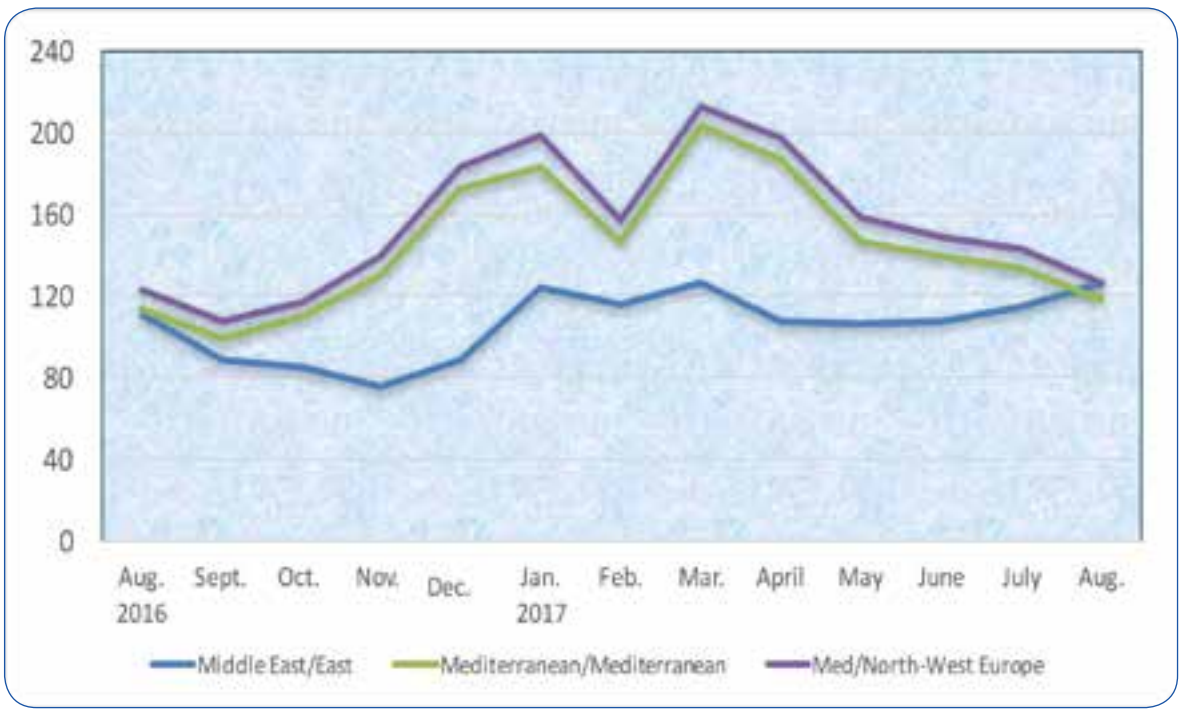


Table (5) and (6) in the annex show crude and products Tankers Freight Rates, 2015-2107.

2.Supply and Demand

Preliminary estimates in August 2017 show an increase in world oil demand by 1% or 1 million b/d, comparing with the previous month level to reach 99.9 million b/d, representing an increase of 1.9 million b/d from their last year level.

Demand in OECD countries increased by 1% or 0.5 million b/d comparing with their previous month level to reach 48.6 million b/d, representing an increase of 0.6 million b/d from their last year level. And demand in Non-OECD countries increased by 1% or 0.5 million b/d comparing with their previous month level to reach 51.4 million b/d, representing an increase of 1.3 million b/d from their last year level.

On the supply side, preliminary estimates show that world oil supplies for August 2017 decreased by 0.1% or 0.1 million b/d, comparing with the previous month to reach 99.5 million b/d, representing an increase of 2.6 million b/d from their last year level.

In August 2017, OPEC crude oil and NGLs/condensates total supplies decreased by 0.3% or 0.1 million b/d, comparing with the previous month to reach 39.5 million b/d, the same of last year level. Preliminary estimates show that Non-OPEC supplies remained stable at the same previous month level of 60 million b/d, a level that is 2.7 million b/d higher than last year.

Preliminary estimates of the supply and demand for August 2017 reveal a shortage of 0.4 million b/d, compared to a surplus of 0.7 million b/d in July 2017 and a shortage of 1.1 million b/d in August 2016, as shown in **table (2)** and **figure (6)**:

Table 2 **World Supply and Demand** (Million b/d)

	August 2017	July 2017	Change from July 2017	August 2016	Change from August 2016
OECD Demand	48.6	48.1	0.5	48.0	0.6
Rest of the World	51.4	50.8	0.5	50.0	1.3
World Demand	**99.9**	**98.9**	**1.0**	**98.0**	**1.9**
OPEC Supply:	39.5	39.6	-0.1	39.5	0.0
Crude Oil	32.5	32.7	-0.2	32.8	-0.3
NGL's & Cond.	7.0	6.9	0.1	6.7	0.3
Non-Opec Supply	57.5	57.4	0.1	54.9	2.6
Processing Gain	2.5	2.6	-0.1	2.4	0.1
World Supply	**99.5**	**99.6**	**-0.1**	**96.9**	**2.6**
Balance	**-0.4**	**0.7**		**-1.1**	

Source: Energy Intelligence Briefing Sept. 20, 2017.

Tables (7) and **(8)** in the annex show world oil demand and supply for the period 2015-2017.

Figure - 6 **World Supply and Demand** (Million b/d)

US tight oil production

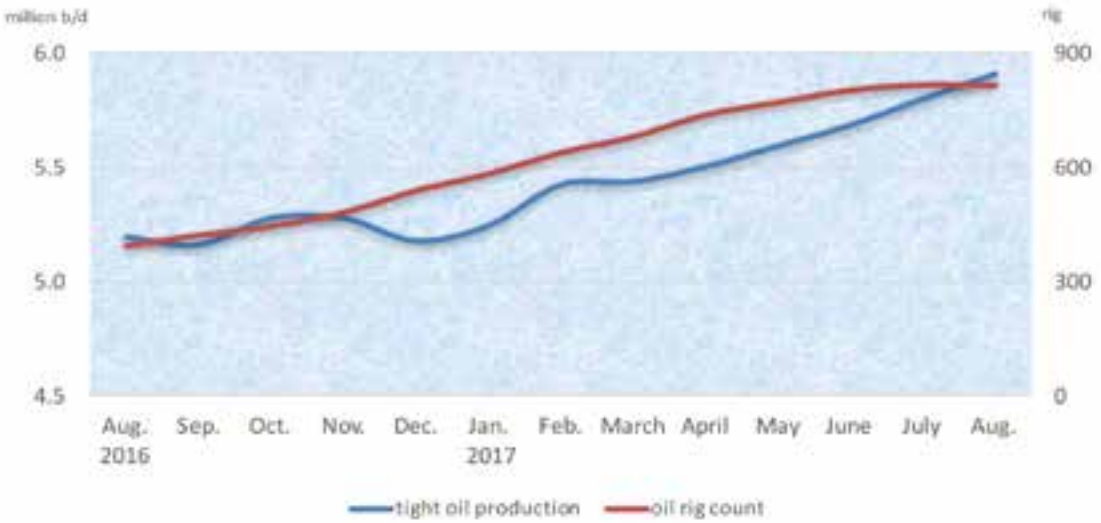
In August 2017, US tight oil production increased by 109 thousand b/d or 1.9% comparing with the previous month level to reach 5.907 million b/d, representing an increase of 716 thousand b/d from their last year level. The US oil rig count decreased by one rig comparing with the previous month level to reach 814 rig, a level that is 420 rig higher than last year, as shown in **table (3)** and **figure (7)**:

Table 3 **US* tight oil production** (Million b/d)

	August 2017	July 2017	Change from July 2017	August 2016	Change from August 2016
tight oil production	5.907	5.798	0.109	5.191	0.716
Oil rig count (rig)	814	815	(1)	394	420

Source: EIA, Drilling Productivity Report for key tight oil and shale gas regions, October 2017.
* focusing on the six most prolific areas, which are located in the Lower 48 states. These six regions accounted for 92% of domestic oil production growth during 2011-2014, Bakken, Eagle Ford, Haynesville, Niobrara, Permian, Appalachia (Utica and Marcellus), in addition to Anadarko region which become the target of many producers in the recent years, as of July 2017, there are 129 operating rigs in the Anadarko region.

Figure - 7 **US tight oil production and oil rig comt** (Million b/d)



3.Oil Trade

USA

In July 2017, US crude oil imports increased by 61 thousand b/d or 0.8% comparing with the previous month level to reach 8 million b/d. Whereas US oil products imports decreased by 117 thousand b/d or 5.7% to reach about 1.9 million b/d.

On the export side, US crude oil exports increased by 211 thousand b/d or 33.3% comparing with the previous month level to reach 845 thousand b/d, and US products exports increased by 37 thousand b/d or 0.8% to reach 4.6 million b/d. As a result, US net oil imports in July 2017 were 304 thousand b/d or nearly 6.4% lower than the previous month, averaging 4.5 million b/d.

Canada remained the main supplier of crude oil to the US with 41% of total US crude oil imports during the month, followed by Saudi Arabia with 13%, then Mexico with 8%. OPEC Member Countries supplied 41% of total US crude oil imports.

Japan

In July 2017, Japan's crude oil imports increased by 542 thousand b/d or 18.3% comparing with the previous month to reach 3.5 million b/d. Whereas Japan oil products imports decreased by 13 thousand b/d or 2.4% comparing with the previous month to reach 532 thousand b/d.

On the export side, Japan's oil products exports increased in July 2017, by 98 thousand b/d or 19.2% comparing with the previous month, averaging 607 thousand b/d. As a result, Japan's net oil imports in July 2017 increased by 431 thousand b/d or 15.1% to reach 3.3 million b/d.

Saudi Arabia was the big supplier of crude oil to Japan with a share of 40% of total Japan crude oil imports, followed by UAE with 21% and Qatar with 8% of total Japan crude oil imports.

China

In July 2017, China's crude oil imports decreased by 608 thousand b/d or 7% to reach 8.2 million b/d, and China's oil products imports decreased by 337 thousand b/d or 22.5% to reach 1.2 million b/d.

On the export side, China's crude oil exports reached 46 thousand b/d. And China's oil products exports increased by 46 thousand b/d or 4.1% to reach 1.1 million b/d. As a result, China's net oil imports reached 8.2 million b/d, representing a decrease of 10.5% comparing with the previous month level.

Russia was the big supplier of crude oil to China with 16% of total China's crude oil imports during the month, followed by Saudi Arabia with 12%.

Table (4) shows changes in crude and oil products net imports/(exports) in July 2017 versus the previous month:

Table 4 **USA, Japan and China Crude and Product Net Imports / Exports** (Million bbl/d)

	Crude Oil			oil Products		
	July 2017	June 2017	Change from June 2017	July 2017	June 2017	Change from June 2017
USA	7.131	7.281	-0.150	-2.675	-2.521	-0.154
Japan	3.349	2.807	0.542	-0.075	0.036	-0.111
China	8.157	8.733	-0.576	0.008	0.391	-0.383

Source: OPEC Monthly Oil Market Report, various issues 2017.

4. Oil Inventories

In July 2017, OECD commercial oil inventories increased by 1 million barrels to reach 3017 million barrels – a level that is 89 million barrels lower than a year ago. It is worth mentioning that during the month, commercial crude inventories in OECD decreased by 4 million barrels to reach 1209 million barrels, whereas commercial oil products inventories increased by 5 million barrels to reach 1808 million barrels.

Commercial oil inventories in Americas decreased by 25 million barrels to reach 1571 million barrels, of which 641 million barrels of crude and 930 million barrels of oil products. Commercial oil Inventories in Europe

increased by 12 million barrels to reach 1008 million barrels, of which 371 million barrels of crude and 637 million barrels of oil products. And commercial oil inventories in Pacific increased by 14 million barrels to reach 438 million barrels, of which 197 million barrels of crude and 241 million barrels of oil products.

In the rest of the world, commercial oil inventories decreased by 10 million barrels to reach 3036 million barrels, and the Inventories at sea decreased by 26 million barrels to reach 1178 million barrels.

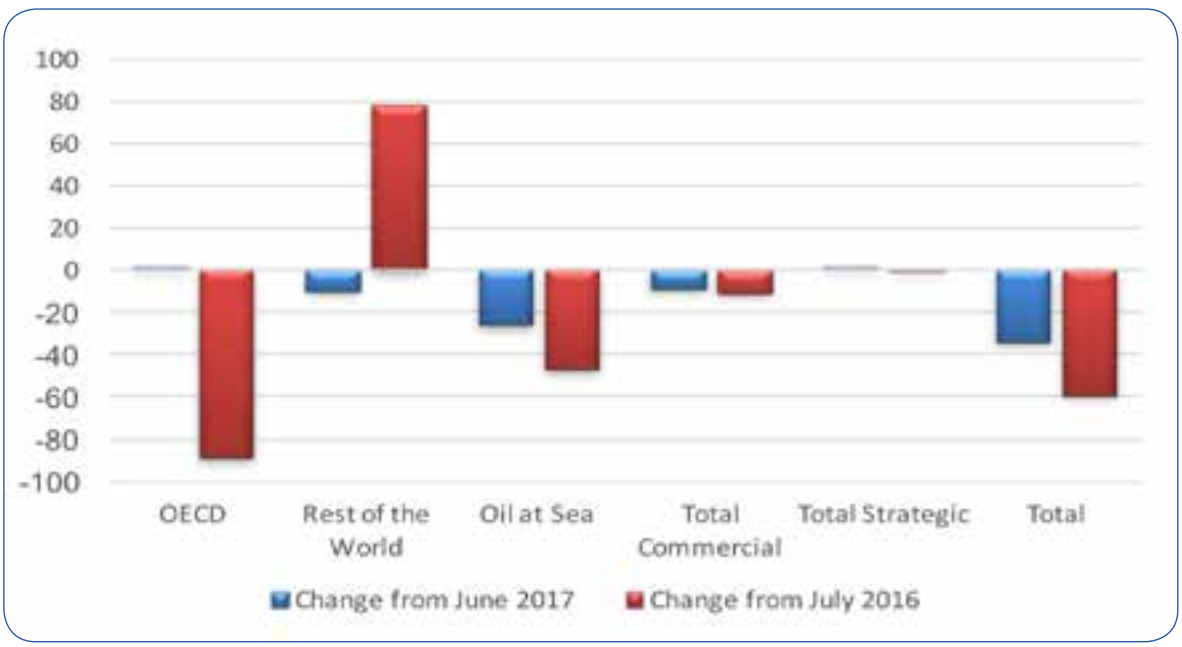
As a result, Total Commercial oil inventories in July 2017 decreased by 9 million barrels to reach 6053 million barrels – a level that is 11 million barrels lower than a year ago.

Strategic inventories in OECD-34, South Africa and China increased by 1 million barrels to reach 1869 million barrels – a level that is 1 million barrels lower than a year ago.

Total world inventories, at the end of July 2017 were at 9100 million barrels, representing a decrease of 34 million barrels comparing with the previous month, and a decrease of 59 million barrels comparing with the same month a year ago.

Table (9) in the annex and **figure (8)** show the changes in global inventories prevailing at the end of July 2017.

Figure - 8 **Changes in Global Inventories at the End of July 2017** (Million bbl)



II. The Natural Gas Market

1- Spot and Future Prices of Natural Gas in US market

The monthly average of spot natural gas price at the Henry Hub in August 2017 decreased by $0.08/million BTU comparing with the previous month level to reach $2.90/million BTU.

The comparison, shown in **table (5)**, between natural gas prices and the WTI crude reveal differential of $5.4/ million BTU in favor of WTI crude.

Table 5 Henry Hub Natural Gas, WTI Crude Average, and Low Sulfur Fuel Oil Spot Prices, 2016-2017 (Million BTU[1])

	Aug. 2016	Sep.	Oct.	Nov.	Dec.	Jan. 2017	Feb.	Mar.	Apr.	May.	June	July	Aug.
Natural Gas [2]	2.8	3.0	3.0	2.6	3.6	3.3	2.8	2.9	3.1	3.2	3.0	3.0	2.9
WTI Crude [3]	7.7	7.8	8.6	7.9	9.0	9.1	9.2	8.6	8.8	8.4	7.8	8.1	8.3

1. British Thermal Unit.
2. Henry Hub spot price.
3. WTI – West Texas Intermediate Crude oil price, in dollars per barrel, is converted to dollar per million BTU using a conversion factor of 5.80 million BTU/bbl.

Source: http://www.eia.gov/dnav/ng/hist/rngwhhdM.htm

2- LNG Markets in North East Asia

The following paragraphs review the developments in LNG Markets in North East Asia, concerning prices and Japanese, Chinese and South Korean imports of LNG and their sources, and Spot LNG Exporters Netbacks.

2.1. LNG Prices

In July 2017, the price of Japanese LNG imports decreased by $0.01/ million BTU comparing with the previous month to reach $8.3/ million BTU. Whereas the price of Chinese LNG imports increased by $0.2/million BTU comparing with the previous month to reach $7.4/ million BTU, and the price of Korean LNG imports increased by $0.02/million BTU comparing with the previous month to reach $7.9/ million.

2.2. LNG Imports

Total Japanese, Korean and Chinese LNG imports from various sources, decreased by 0.2% or 29 thousand tons from the previous month level to reach 12.654 million tons.

Table (6) shows the prices and quantities of LNG imported by Japan, South Korea, and China for the period 2015-2017.

Table6 LNG Prices and Imports: Korea, Japan, and China 2015-2017

	Imports (thousand tons)				Average Import Price ($/million BTU)		
	Japan	Korea	China	Total	Japan	Korea	China
2015	**84850**	**33141**	**19606**	**137597**	**10.2**	**10.6**	**8.6**
2016	**82767**	**33257**	**26017**	**142041**	**6.9**	**6.9**	**6.5**
January 2016	7245	3338	2464	13047	7.9	8.0	7.3
February	7370	2998	1801	12169	8.0	7.8	6.9
March	7959	3282	1702	12943	7.2	7.3	6.6
April	6382	2177	1861	10420	6.4	6.6	6.6
May	5455	2218	1425	9098	5.9	6.0	6.3
June	6193	2484	2146	10823	6.0	5.7	6.0
July	6460	1918	1604	9982	6.3	5.9	5.4
August	7656	1971	2257	11884	6.7	6.3	6.0
September	6671	2236	2527	11434	7.1	6.8	6.1
October	6282	3187	1838	11307	7.2	7.3	6.7
November	7545	3422	2659	13626	7.1	7.5	6.8
December	7549	4026	3733	15308	7.1	7.3	7.1
Jaunary 2017	8302	4294	3436	16032	7.5	7.9	7.0
February	7790	3600	2372	13762	7.9	8.0	7.0
March	8143	3527	1991	13661	7.7	7.8	6.9
April	6573	2337	2171	11081	8.2	7.8	7.0
May	6239	2488	2911	11638	8.5	8.3	7.3
June	6185	3460	3038	12683	8.3	7.8	7.1
July	6817	2716	3121	12654	8.3	7.9	7.4

Source: World Gas Intelligence various issues.

2.3. Sources of LNG imports

Australia was the big supplier of LNG to Japan, Korea and China with 4.108 million tons or 32.5% of total Japan, Korea and China LNG imports in July 2017, followed by Qatar with 17% and Malaysia with 16.6%.

The Arab countries LNG exports to Japan, Korea and China totaled 3.073 million tons - a share 24.3% of total Japanese, Korean and Chinese LNG Imports during the same month.

2.4. LNG Exporter Netbacks

With respect to the Netbacks at North East Asia markets, Russia ranked first with $4.85/million BTU at the end of July 2017, followed by Indonesia with $4.75/million BTU then Australia and Malaysia with $4.70/million BTU. And LNG Qatar's netback reached $4.54/million BTU, and LNG Algeria's netback reached $4.21/million BTU.

Table (7) shows LNG exporter main countries to Japan, South Korea, and China and their netbacks at the end of July 2017.

Table7 LNG Exporter Main Countries To Japan, Korea and China, And Their Netbacks At The End Of JULY 2017

	Imports (thousand tons)				Spot LNG Netbacks at NE Asia Markets ($/million BTU)
	Japan	Korea	China	Total	
Total Imports, of which:	**6817**	**2716**	**3121**	**12654**	
Australia	1972	384	1752	**4108**	**4.70**
Qatar	724	965	459	**2148**	**4.54**
Malaysia	1333	358	407	**2098**	**4.70**
Indonesia	414	366	278	**1058**	**4.75**
Russia	582	66	_	**648**	**4.85**

*** Export Revenues minus transportation costs, and royalty fees.**
Source: World Gas Intelligence various issues.

Tables Annex

ANNOUNCEMENT

OAPEC AWARD FOR SCIENTIFIC RESEARCH FOR THE YEAR 2018

Pursuant to its policy of encouraging scientific research by awarding two prizes on a biennial basis (First Prize KD 7000, Second Prize KD 5000, equivalent to USD $23000 and USD $16000), upon the resolution number 1/147 of OAPEC Executive Bureau at its meeting dated 14/5/2017. The Organization of Arab Petroleum Exporting Countries (OAPEC) is pleased to announce that the research field selected for the "OAPEC Award for Scientific Research for the Year 2018" is:

"Petroleum and Energy- Related Economic Research Including Supply, Consumption and Prices"

Research Theme:

The economic dimension represents a major component of energy industry, in general, and oil and gas in particular. Economic research addressing petroleum and energy industry covers a broad spectrum of expanses, including supply, demand, trade movements, prices trend, petroleum revenues, investment, and the various energy policies. Correlation between energy and sustainable development goals, as well as numerous other aspects, are also targeted by the research. A whole host of addressable thrusts are tackled in the different parts of the research. The economic aspect, pertinent to one of the proposed petroleum and energy, should tackled by the researcher. These domains include:

1. **Current and Future Developments in Energy Markets.**
2. **Global Supply of Various Energy Sources.**
3. **Global Energy Demand: Current and Future Prospects.**
4. **Developments in Energy Prices and Their Implications for Demand and Supply Levels.**
5. **Energy Subsidy Policies and Their Impacts on Domestic Economies.**
6. **Petroleum Revenues and Their Impact on Producing Countries' Economies.**
7. **Investment in Energy, Enhancing The Role of The Private Sector: Current Status and Future Prospects.**
8. **The Energy Policies in The Main Consuming Countries and Their Implications for The Energy Future.**

Conditions for Submitting the Research

1. **The research may be submitted by one or more author(s). Institutions and organizations are excluded.**
2. **The research submitted must be new and original, and has not been granted an award previously.**
3. **The author(s) shall agree in advance to give OAPEC the right to print and publish the research in case his/her/their win one of the prizes. A signed statement to this effect must be submitted with the research (sample provided below). The author(s) will maintain all other rights, including patent rights (if applicable). OAPEC shall not exercise its right to publish the winning research for a period of six months commencing with the date of advising the winning author (s) with the decision of the Award Committee.**
4. **A statement by the author(s), attesting that the research is original. Segments fully or partially adopted from other sources should be properly cited. A detailed list of all references used must also be attached.**

5. **Four hard copies and a digital copy of the research (either in Arabic or English) should be submitted, along with the Curriculum Vitae of each researcher, to the Organization of Arab Petroleum Exporting Countries.**
6. **The deadline for submitting the research is 31st May, 2018. No submission will be accepted after that date.**
7. **Prizes are awarded to individuals of all nationalities advised of the Award Committee's decision.**
8. **The award will not be presented twice consecutively to the same recipient.**
9. **Any research that does not fulfill the above conditions shall be disregarded.**

Researchers will be notified by OAPEC Secretariat of the Award Committee's decision. The winners will be officially announced at the end of the OAPEC's Ministerial Council in 2018.

For further information you may contact the OAPEC General Secretariat at:

Organization of Arab Petroleum Exporting Countries (OAPEC)
Secretariat of the Award Organizing Committee
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Tel.: (+965) 24959766 - Fax: (+965) 24959755
E-mail:oapecaward2018@oapecorg.org
Website: www.oapecorg.org

Organization of Arab Petroleum Exporting Countries (OAPEC)
OAPEC AWARD FOR SCIENTIFIC RESEARCH FOR THE YEAR 2018

Field

"Petroleum and Energy-Related Economic Research Including Supply, Consumption and Prices "

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Hereby undertake to relinquish all printing and publications right of the research submitted by me entitled:

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Name: .....

Signature: .....

Date: / /