OPEC bulletin

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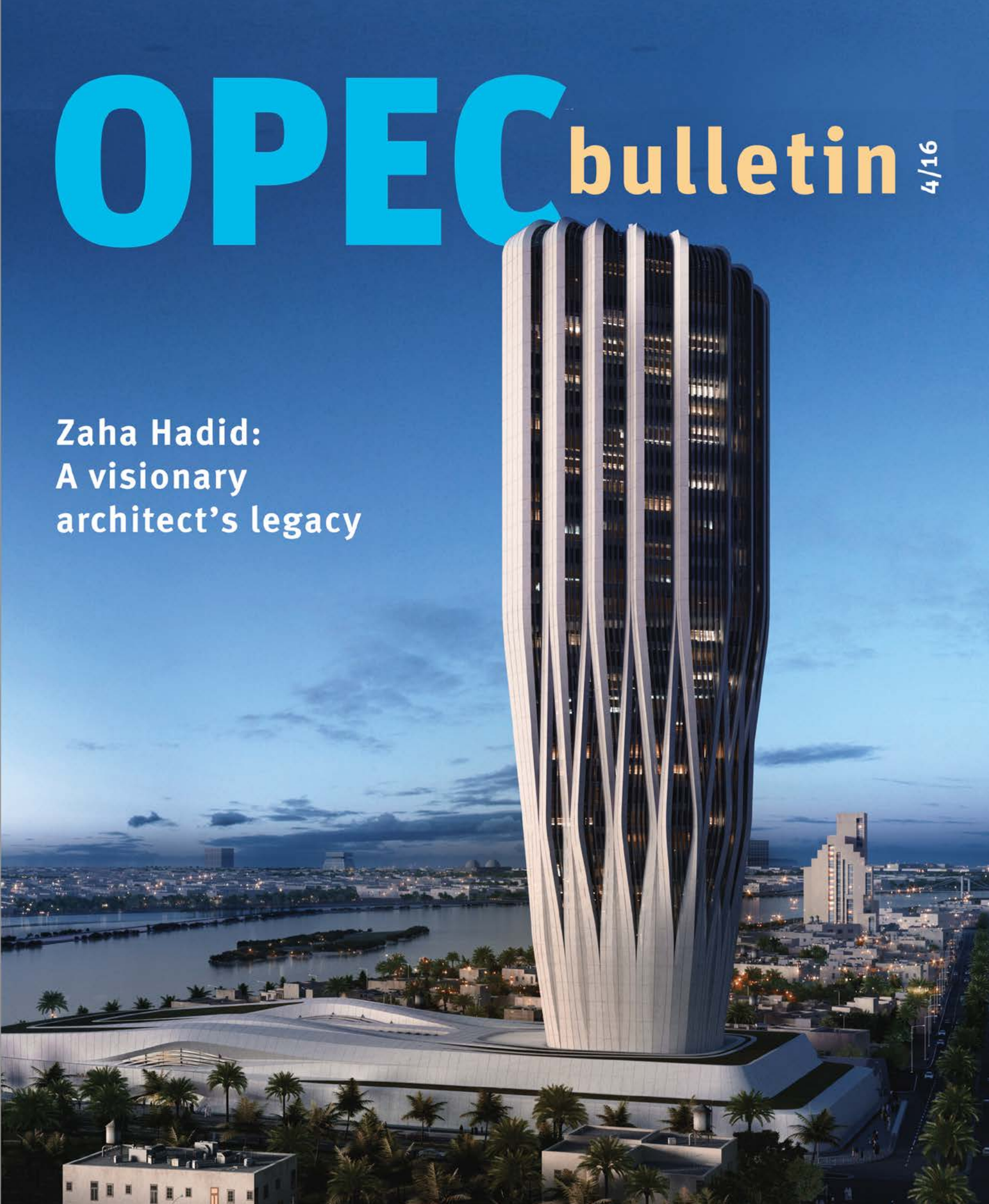

Zaha Hadid: A visionary architect's legacy

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Fossil fuels and the future

In recent years, much has been said about the importance of developing renewable energy, especially those sources that come with an 'environmentally friendly' stamp of approval. This need has become even more pressing in the wake of the landmark Paris Agreement on climate change, reached by world leaders in December last year. However, while it is commendable to support 'green' sources of energy that have the potential to help preserve the planet for future generations, one has to be realistic. The fact is, in the overall energy mix, there is only so much that renewables, such as solar, wind power and biofuels, can do to supply the burgeoning levels of efficient, reliable and affordable energy the world requires. That is certainly the case now and one that will see only gradual change in the foreseeable future. All forecasts point to fossil fuels continuing to satisfy the lion's share of global energy demand in the years ahead.

Past experience has shown that the energy sector will need to continue to evolve if it is to keep pace with progress and meet future challenges. In fact, such will be the level of global demand, that all sources of energy — conventional, unconventional, as well as renewables — will likely be required to adequately cover growing consumption levels.

The facts are quite profound: by 2040, OPEC predicts global economic growth doubling from today's levels, as the number of people on the planet expands by 1.7 billion. Significantly for the oil sector, which is transportation driven, another 1.2bn people will be behind the wheel of an automobile. Commercial vehicles on the road will double, while air travel will soar. And, in the developing countries, massive potential exists for providing access to modern energy services to billions of people currently without adequate means of heating, cooking and lighting.

Translate all these facts into energy demand and unsurprisingly a 50 per cent increase from today's levels is predicted by 2040. Of course, these are just forecasts, which are always subject to change, but even if just half of what is expected today becomes a reality, one constant will remain — fossil fuels will continue to be of paramount importance to the world's economic wellbeing. Surely then, their development should be encouraged and nurtured — certainly not held back.

OPEC Secretary General, Abdalla Salem El-Badri, certainly agrees. "Fossil fuels will need to supply more than three-quarters of the energy mix by 2040," he told delegates at an oil conference in Paris in April. This, he said, compared with a mere 22 per cent share for non-fossil fuel energy.

Such is his conviction that he does not foresee any scenario in which non-fossil fuels could come even close to overtaking fossil fuels in the decades ahead.

"Fossil fuels remain abundant and are necessary for our future, just as they have been an essential part of our past." El-Badri pointed out in Paris.

Obviously, in keeping with the climate change agreement — which OPEC fully supports — all efforts should be made to produce ever-cleaner and ever-safer energy products. And in this regard, the oil industry continues to make huge steps, utilizing the latest technology to refine and adapt processes and rationalize production methods.

Again in Paris, El-Badri said he is a "firm believer" in the potential of technologies that reduce and ultimately eliminate harmful emissions associated with the burning of fossil fuels. He pointed to such proven initiatives as carbon capture and storage.

Of course, developing the technology and providing the extra production capacity needed to support this goal comes at a high monetary cost — money the international petroleum sector is struggling to find in these days of low oil prices. For such large-scale investments to be possible, crude prices need to return to a more reasonable range and more in keeping with the overall requirements of the oil sector.

OPEC is committed to doing all in its power to support the implementation of the Paris agreement. But it will always fly the flag for the continuing use of fossil fuels — particularly oil and gas — which are proven to be essential for the future welfare of the global economy and mankind in general.

It is therefore crucial that these longstanding conventional sources of petroleum, which have served the world well, continue to play centre stage and not be discriminated against, since there is no realistic alternative for meeting the world's energy needs.

For the foreseeable future, renewables, however admirable, will only ever be supplementary, at best.

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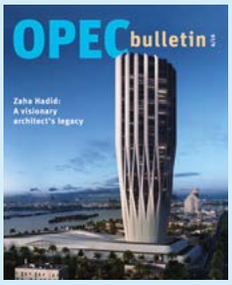

Cover

This month's cover shows an artist's impression of the new Central Bank of Iraq building in Baghdad, one of the last designs of Iraqi-born Zaha Hadid, who died at the end of March (see feature starting on p42). Image courtesy Zaha Hadid Architects.

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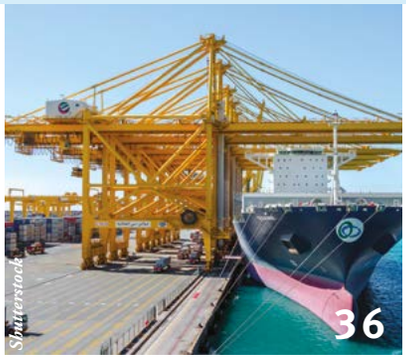
OPEC Membership and aims

OPEC is a permanent, intergovernmental Organization, established in Baghdad, on September 10–14, 1960, by IR Iran, Iraq, Kuwait, Saudi Arabia and Venezuela. Its objective — to coordinate and unify petroleum policies among its Member Countries, in order to secure a steady income to the producing countries; an efficient, economic and regular supply of petroleum to consuming nations; and a fair return on capital to those investing in the petroleum industry. Today, the Organization comprises 12 Members: Qatar joined in 1961; Libya (1962); United Arab Emirates (Abu Dhabi, 1967); Algeria (1969); Nigeria (1971); Angola (2007). Ecuador joined OPEC in 1973, suspended its Membership in 1992, and rejoined in 2007. Gabon joined in 1975 and left in 1995. Indonesia joined in 1962, suspended its Membership on December 31, 2008, and reactivated it again on January 1, 2016.



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The *OPEC Bulletin* welcomes original contributions on the technical, financial and environmental aspects of all stages of the energy industry, research reports and project descriptions with supporting illustrations and photographs.

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Fossil fuels:

Essential for the past — necessary for the future

Philippe H Lambert

Abdalla Salem El-Badri, OPEC Secretary General.

OPEC Secretary General, Abdalla Salem El-Badri, addressed the 17th International Oil Summit in Paris in April. In his comments, he spoke about a world that would rely on all forms of energies — both fossil and non-fossil fuels. But for the immediate future, El-Badri told delegates it was essential to work together to return the international oil market to a more balanced situation and one that would attract the investment necessary for securing an orderly future for both producers and consumers.

"In the long-term, we need to lay a practical and realistic energy path. It is one that requires investments in all energies, both fossil fuels and non-fossil fuels."

A more balanced oil market is clearly beneficial to all associated with the international energy sector, especially the producers and consumers, according to OPEC Secretary General, Abdalla Salem El-Badri.

"And in the long-term, we need to lay a practical and realistic energy path. It is one that requires investments in all energies, both fossil fuels and non-fossil fuels," he told the 17th International Oil Summit in Paris on April 21.

Addressing the conference theme of *Restoring profitability to the oil industry amidst the current environment of costs and prices and after COP 21,* El-Badri stressed that OPEC recognized that the challenges related to the environment and climate change were "a concern for us all."

He told delegates: "And we will continue to push to improve energy efficiency and develop cleaner energies."

El-Badri pointed to the need to continually push to develop more renewables and also highlighted the need for hydropower and nuclear.

"And yes, we need to appreciate the need to develop cleaner fossil fuel technologies, given the future role of fossil fuels."

Sustainable energy future

He said appreciating how expectations for the world's energy future played out over all time frames was essential, adding: "It can help us in delivering a sustainable energy future; for all producers and for all consumers too.

"We need more energy. We need to reduce emissions. And we need to make sure the required investments are made."

El-Badri stated that, in the short-term, there was the need to try and return the oil market to a balanced situation — "with prices returning to levels where investors feel more comfortable and confident in making the necessary long-term investments and where supply does not outstrip demand, and vice versa."

He said it was important to recall that the previous high oil-price cycle was the outcome of a lack of investment in more supply. "And the low oil-price environment we find ourselves in today is the result of too much investment in high-cost production during that previous period."

El-Badri told the conference that he was sure everyone appreciated that the last two years had been a challenging time for the oil industry. At times it had felt as though the industry had been in constant flux, as investments, projects, margins and jobs had all been cut.

While the short-term focus remained on returning balance and stability to the market, he said it was also vital they did not lose sight of the medium- and longer-term outlook.

"All time frames are inter-linked; what happens in the short-term will have knock-on impacts for the industry's prospects," he maintained.

El-Badri said this would be the focus of his remarks to the conference, with a specific emphasis on some of the main topics of its overall theme — restoring profitability; prices; the current environment; and COP 21 — and how all this fitted into what was central to the industry's future — ensuring that the required investments were made.

But in setting the scene, he said he felt it was important to provide some key pointers related to the world's energy and oil future.

Firstly, said El-Badri, the global economy was estimated to more than double in the period to 2040.

Secondly, passenger car ownership rates were expected to increase from just over one billion today to close to 2.2bn by 2040. "The number of commercial vehicles on the road is also anticipated to more than double. And we will no doubt see more flights being taken."

"Fossil fuels remain abundant and are necessary for our future. Just as they have been an essential part of our past. They have positively impacted the lives of billions over the centuries."

Thirdly, said El-Badri, with billions of people still having no access to electricity and many more still relying on biomass for their basic needs, there was huge potential for socio-economic development in terms of expanding access to modern energy services.

Fourthly, the world's population was projected to reach around 9bn by 2040, an increase of over 1.7bn from today's level.

And fifthly, there was last year's COP 21 agreement in Paris to counter the threat posed by climate change, which all OPEC Member Countries were part of.

"Let me stress that OPEC welcomes this agreement," he said.

Looking ahead, said El-Badri, the basic challenge was two-fold: "Given the points I have just outlined, we

expect global energy demand to increase by almost 50 per cent by 2040.

"So how can we ensure there is enough supply to meet demand? And, how can this growth be achieved in a sustainable way, balancing the needs of people in relation to their social welfare, the economy and the environment?"

Of course, said El-Badri, the world would see further actions to improve energy efficiency across economies. That was essential.

"From the perspective of what will make up the future energy mix, it is clear that all forms of energy are required. However, it is crucial we appreciate just what each energy source can provide in the decades ahead."

"We need to look at the development and use of cleaner fossil fuel technologies, such as carbon capture and storage and many others in the future."

El-Badri said there was no doubt that renewables, such as solar and wind, would continue to significantly expand their role. OPEC Member Countries recognized and supported their development. Many investments were being made by Member Countries in this sector.

Nuclear and hydropower, he said, would also maintain their share in the global energy mix in the years ahead.

Overall, non-fossil fuel energy was expected to make up around 22 per cent of the global energy mix by 2040.

"It means that fossil fuels will still need to supply more than three-quarters of the energy mix by 2040," observed El-Badri.

He said he realized that others may have slightly different numbers, but given current energy and technology expectations, "I do not see any outlook predicting that non-fossil fuels will come close to overtaking fossil fuels in the decades ahead."

Moving on to the key themes of the conference and their impact, or potential impact, on oil market investments, El-Badri began with COP 21, stating that given what he had just described, "I find it hard to understand the view that fossil fuels may not be needed in the decades ahead.

"Fossil fuels remain abundant and are necessary for our future. Just as they have been an essential part of our past. They have positively impacted the lives of billions over the centuries," he affirmed.

"They have provided heat, light and mobility. And they have been central to the development of the industrial civilization as we know it today."

As an industry, said El-Badri, "we should be proud of these achievements. For oil, the products derived from this precious natural resource are fundamental to our daily lives. And they will be vital to many more billions of people in the years ahead."

He said that, yes, there were environmental issues regarding the emissions that come from fossil fuels, but he believed that this was a challenge that could be overcome.

"I am a believer that solutions can be found in technologies that reduce and ultimately eliminate these emissions. We need to look at the development and use of cleaner fossil fuel technologies, such as carbon capture and storage and many others in the future," he professed.

El-Badri stated that OPEC recognized the importance of continually looking to advance the environmental credentials of oil, both in production and use.

Tough times for the industry

Turning to the current oil market environment, he said: "I think we can all appreciate that we have witnessed some tough times for the industry over the past two years."

The current cycle, he said, had been supply-driven with much of the additional supply in recent years coming from high-cost non-OPEC production. In the three-year period between 2013 and 2015, non-OPEC supply increased by over five million barrels/day, while OPEC production actually saw a slight contraction.

"In looking at 2016, we do see a further rebalancing of supply and demand as we move through the year. And as with previous cycles, I have no doubt that the industry will come through this one. However, uncertainties remain. Here, I am specifically referencing stock levels."

El-Badri noted that, since the end of 2013, OECD commercial oil stocks had seen their five-year average move

from a negative level of 85 million barrels to a surplus of around 350m b today.

"It should also be noted that more than three-quarters of this overhang is in North America. There is no doubt this has strongly impacted crude prices."

For the same period, said El-Badri, there had also been a rise in non-OECD inventories, plus an expansion in some non-OECD strategic petroleum reserves.

"It is essential both OPEC and non-OPEC producers, as well as consumers, look to address the issue of the stock overhang. As we have seen in previous cycles, once this overhang starts falling then prices start to rise.

"Here, we need to remember that low oil prices are bad for producers today and lead to situations that are bad for consumers tomorrow. And high oil prices are bad for consumers today and lead to situations that are bad for producers tomorrow."

El-Badri stressed that this all underlined the investment challenge facing the industry.

"To put it simply, for any industry, investors will only put money into projects if they see demand for their product and have expectations for a profitable outcome. This is natural."

He said all investments required certain conditions. "For example, in terms of security of demand, we need to recognize that this is just as important to producers as security of supply is to consumers. Its absence can lead to investment uncertainty, and, in turn, future market instability.

"Producers do not want to waste precious financial resources now on infrastructure that might not be needed in the future. At the same time, however, if timely and adequate investments are not made, then future consumer needs might not be met."

Of course, observed El-Badri, in the current oil market environment "we are already witnessing significant investment cuts due to low oil prices."

For example, he continued, global exploration and production spending fell by around 20 per cent last year and a further 15 per cent drop was anticipated this year. "This is a major concern for an industry that generally sees investments increasing year-on-year."

"It is essential both OPEC and non-OPEC producers, as well as consumers, look to address the issue of the stock overhang. As we have seen in previous cycles, once this overhang starts falling then prices start to rise."

El-Badri said that to put these investments concerns into some context, "we see oil-related investment requirements of around $10 trillion over the period to 2040. "This is to help meet an increase of around 17m b/d over the period, with demand reaching close to 110m b/d."

He said new barrels were also needed to not only increase production, but to accommodate for decline rates from existing fields.

"The current environment is evidently putting this future at risk. It is vital to keep in mind the link between the marginal cost, the price and investments," he professed.

OPEC sees oil-related investment requirements costing around $10 trillion up to 2040.

12th Energy Dialogue Meeting convenes in Vienna

EU, OPEC reaffirm commitment to tackling energy challenges

Abdalla Salem El-Badri (l), OPEC Secretary General, and European Commissioner for Climate Action and Energy, Miguel Arias Cañete.

OPEC and the European Union (EU) have reaffirmed their commitment to continue working together to meet and help overcome the current and future challenges in the international energy market.

The pledge was made at the 12th High-Level Meeting of the EU-OPEC Energy Dialogue, held in Vienna in March.

Delegations led by OPEC Secretary General, Abdalla Salem El-Badri, and European Commissioner for Climate Action and Energy, Miguel Arias Cañete, assembled at the Organization's Secretariat to discuss a variety of energy issues, especially the effects and repercussions of today's low crude oil prices.

A joint *communiqué*, issued at the end of the one-day meeting, said that both the EU and OPEC recognized that through the Energy Dialogue and through initiatives in other global fora and organizations, "cooperation should be enhanced, as should understanding of the behaviour of the energy and oil markets, something which is important to helping achieve future oil market stability."

Addressing a joint press briefing, Arias Cañete, said: "We expect oil to remain an important fuel in our energy system in the years to come and therefore our current and future economies depend on a stable and affordable supply of oil."

Global energy landscape

"This is becoming a growing challenge because the global energy landscape has become volatile and unpredictable," he stressed.

However, Arias Cañete pointed out that, despite the oil price fluctuations, OPEC had demonstrated to be an efficient, reliable and economic supplier of oil.

"And in this context, the partnership between the EU and OPEC is more important than ever," he maintained.

El-Badri responded by stating that the EU-OPEC Energy Dialogue had started out in 2005 and over the years had greatly improved. "We have discussed a lot of subjects together that have a mutual interest."

According to the joint *communiqué*, the parties noted that since the last Energy Dialogue meeting in June 2014, there had been a growing challenge in energy markets, particularly for oil.

Oil prices had fallen by more than 70 per cent, many investments had been deferred or cancelled, manpower had been laid off, and the market had been searching for a supply-demand balance.

"Although producers and consumers might have different views on what is an adequate oil price level, there was broad agreement that excessive oil price volatility and/or sharp price rises would be harmful for the economies of both the producing and consuming countries," it stated.

"An affordable and stable oil price, alongside a balanced and stable market, is a prerequisite for economic growth for both producers and consumers," it asserted.

Both parties emphasized that the Energy Dialogue had come a long way since its establishment in 2005 and was more important than ever in the current context of energy markets.

"Supported by various roundtables, workshops and studies, the Energy Dialogue has resulted in productive joint activities on a wide range of oil and energy-related issues and has brought significant benefits to both sides," read the communique.

Looking ahead, it stated that both the EU and OPEC had noted with concern that the current price environment had considerably reduced investments.

"Such a massive fall in investment could in time lead to a supply shortfall and the risk of a sharp oil price rebound, as has been witnessed in the past."

The *communiqué* observed that the adoption in December 2015 of the 'Paris Agreement' to combat climate change was welcomed by both sides.

During a busy meeting agenda, OPEC presented an assessment of short-term oil market prospects in which it highlighted that lower crude oil prices mainly reflected the ongoing excess crude oil supply over global demand.

"The positive impacts of low oil prices on oil demand in major growth regions remain intact in both the OECD and non-OECD regions. Expected oil demand growth in 2016 is in line with the average seen over the last three years," it revealed.

On the supply side, it said, lower oil prices had reversed the strong growth trend in non-OPEC supply into an expected contraction in 2016.

It was noted, however, that, over the previous three years, non-OPEC supply had increased significantly,

while, on average, there was no growth in OPEC crude supply.

OPEC also provided an overview of the long-term oil market outlook, highlighting that energy demand would increase by almost 50 per cent in the period up to 2040, with oil remaining the fuel with the largest share over the next 20 years.

OPEC supply to increase steadily

"Oil demand reaches almost 110 million barrels/day by 2040, with developing countries accounting for most of the growth. On the supply side, total non-OPEC supply is expected to increase in the next decade, but declines towards the end of the projection period."

It informed that OPEC crude supply was anticipated to increase steadily which underscored once again the need for future investments in the industry.

However, it was stressed that the outlook was clouded with uncertainties stemming, in particular, from economic growth and non-OPEC supply prospects.

The EU side presented the latest developments in EU energy policies, focusing on the Communication on the State of the Energy Union of November 2015 and the 'Security of Supply Package' adopted by the Commission in February 2016.

It noted that the package included initiatives to foster EU energy security, notably two proposals for the revision of the Regulation on Security of Gas Supply and for a revision of the Decision on Intergovernmental Agreements, as well as strategies for liquefied natural gas (LNG) and gas storage and for heating and cooling.

The EU delegation to the talks, led by Miguel Arias Cañete (second l), European Commissioner for Climate Action and Energy.

The main EU energy policy initiatives foreseen for 2016 were also presented. Emphasis was given to a package, to be adopted later this year, which will propose initiatives in energy efficiency, said to be a key tool to achieve the region's decarbonization objectives and for a more sustainable use of energy.

The EU expressed its willingness and availability to share its experience in the area of energy efficiency with its OPEC partners in the framework of the current Energy Dialogue or in other fora.

It also presented the economic developments and outlook in the EU and in the euro area based on the latest European economic forecasts issued in February 2016.

"The European economy has now entered its fourth year of recovery and growth is expected to continue increasing at a moderate pace, driven mainly by rising consumption," noted the *communiqué*.

The ongoing and future activities of the Energy Dialogue were also discussed by delegates.

These included a report on a roundtable that discussed the outcomes of a joint study on the 'Petrochemical Outlook: Challenges and Opportunities'. There was also an update on a joint study being undertaken on the prospects for non-crude liquids.

All participants expressed satisfaction with the outcome of the meeting, which was seen as a further important step in the EU-OPEC Energy Dialogue.

Both parties expressed their strong commitment to that process and agreed that the next EU-OPEC Energy Dialogue meeting would take place in the first half of 2017.

Abdalla Salem El-Badri (r), OPEC Secretary General, headed the team from the OPEC Secretariat.

At the press briefing ...

Miguel Arias Cañete and Abdalla Salem El-Badri

Conducting the press briefing are Miguel Arias Cañete (l), European Commissioner for Climate Action and Energy; and Abdalla Salem El-Badri (r), OPEC Secretary General.

European Commissioner for Climate Action and Energy, Miguel Arias Cañete, led the press briefing with OPEC Secretary General, Abdalla Salem El-Badri, after the12th High-Level Meeting of the EU-OPEC Energy Dialogue at the OPEC secretariat in Vienna.

He started by saying that the international community, led by the European union and supported by several OPEC Member Countries, had embarked on a transition to a low-carbon economy.

"The EU has set ambitious targets and is working towards changing its legislation to make the Paris Agreement (on climate change) a reality. Our commitment is universal and, in the long run, the plan is for fossil fuels not to be the basis of our economies," he stated.

"But let us be realistic — this transition will not happen overnight. For the time being, oil will remain an indispensable resource for all the sectors of Europe's economy, which is highly dependent on imports to the tune of 90 per cent," he maintained.

"I therefore welcome that, at our meeting today, we had an open exchange on a number of key topics of mutual interest to us, including the impact of the low-price environment. In this regard, I have stressed that we should seize the opportunity this offers for both the producers and the consumers to reinforce our efforts to remove environmental harmful subsidies.

"But we also want to enforce our cooperation and expand this to other fields, such as energy efficiency."

Arias Cañete stressed that while the EU was working hard to decarbonize its economy, "we will need to ensure a secure energy supply for the EU. OPEC will remain a key partner in this transition."

Asked whether the Energy Dialogue Meeting had discussed the proposed 'production freeze' recommended by some producers, to help the current oil market situation, he said the delegates had discussed all aspects of energy policy, including the freeze.

"But from the side of the EU, our main interest is to have stable prices that do not have large spikes because when oil markets rebalance we do not want to see a high spike in prices like we have seen in the past.

"So we are following developments very closely … the EC will assess the oil market on a day-to-day basis.

Arias Cañete said what the EC would do was to very carefully monitor the energy and oil markets and assess the implications of any proposal on a production freeze agreed or implemented.

"… the key interest from the perspective of the EU is to ensure that conditions from the supply side remain in place to guarantee stable and competitive oil prices in the future," he asserted.

"Today, in our meeting, we have exchanged views on the short- and long-term evolution of the market and our permanent cooperation with OPEC," he added.

Energy policy objectives

Questioned about the EC's future key energy policy objectives, Arias Cañete made it clear that these would not depend on exogenous factors as oil prices because the EU's 2020 and 2030 targets would be achieved independently of this factor.

"For sure, lower oil prices may have an impact on the economic viability of certain alternative energy forms, in particular in the transport sector, but at the same time within the current situation of low prices it provides a very good opportunity to bring about a further reduction in environmental harmful subsidies," he said.

In his comments at the briefing, El-Badri also spoke about the climate change negotiations, stating that OPEC supported COP21 and all Member Countries had submitted their indices.

"But as Commissioner Arias Cañete said, we have to be realistic. We really cannot come up with clean energy in the near future. We need some time to work together to come up with workable solutions because right now fossil fuels' share in the energy mix is about 88 per cent.

"It might fall from that high percentage by 2040, but we see this percentage lasting for some time because the other sources of energy are starting from a very low base," he observed.

Hopeful prices have bottomed out

Concerning current oil prices, El-Badri stated he was hopeful the price had bottomed out "and we hope that the rising trend in prices we have seen of late will continue. I do not expect the price to go high, but that it will reach a moderate level."

Asked whether he thought just freezing production would be sufficient for oil prices to rise, or whether producers should actually cut output, El-Badri replied: "Let us take it one step at a time — look at the production freeze option first and then discuss other ways and means later."

In answer to another question, El-Badri said they were now seeing a positive impact on crude oil prices. "Let us see what will happen because the price did go down to a level we did not think would be achieved."

Speaking about the volatility in crude oil prices, the OPEC Secretary General said it was by no means the first time the market had experienced high and low oil price scenarios.

"I have personally seen this cycle five times. We have had periods when prices were high and then came down and periods when they fell and then went back up. The current cycle is perhaps a little bit different because it was caused by a high supply of high-cost oil. We will overcome it and the price will return to normal."

El-Badri said he thought OPEC's current oil production policy was working "because we see that the high-cost non-OPEC production is declining very rapidly. Unfortunately, this is at the cost of many oil rigs that remain idle now.

"Also, investment is declining — it fell by 35 per cent from 2015 to 2016. So as we go into the future, there will be less supply. But, at this time, the only real problem I see is the overhang in oil stocks, which are currently in excess of around 300 million barrels in the OECD region alone. If we can get rid of this overhang, then oil prices will start to recover."

Extreme oil prices in no-one's interest

— El-Badri

Extreme crude oil prices — either too high or too low — are not in the interests of either the producers or consumers of the commodity, according to OPEC Secretary General, Abdalla Salem El-Badri.

"Low crude oil prices are bad for producers today and lead to situations that are bad for consumers tomorrow," he told delegates attending the 12th High-Level Meeting of the European Union-OPEC Energy Dialogue in Vienna in March.

"And high oil prices are bad for consumers today and lead to situations that are bad for producers tomorrow," he pointed out in his opening remarks to the annual talks, held at the Organization's Secretariat.

Referring to the decline in international oil prices,

Abdalla Salem El-Badri, OPEC Secretary General.

El-Badri said he had no doubt that the oil industry would come through the current down cycle.

"Market forces, as well as cooperation among producers, will eventually lead to the return of stability," he maintained.

El-Badri pointed out that it was evident from today's oil challenges that the importance of such a dialogue between the world's energy stakeholders had never been greater.

Significant readjustment

"Energy markets are going through a significant readjustment. The issues and challenges before us are ones for both producers and consumers," he affirmed.

"Since the dialogue began in 2005, we have seen much positive and constructive dialogue, an expansion in our joint activities, with various workshops, roundtables and reports, and the building of relationships at all levels.

"Many of these will be apparent in our first session this afternoon, which focuses on the short- and long-term oil and energy market outlooks, as well as some of the latest developments in EU energy and economic policies."

El-Badri said that from the perspective of the oil market, everyone in attendance could appreciate that the past 18 months or so had been a challenging time for the industry.

Since July 2014, crude prices had fallen by more than 70 per cent, many investments had been deferred and some cancelled, manpower had been laid off, supply had been greater than demand, stocks had risen above their five-year average, and the market had been searching for balance.

He told the meeting that the current cycle was triggered by oversupply. But what had been different on this occasion was that most of the supply increases in recent years had come from high-cost production.

"The market is now taking on board this new reality and gradually resetting itself," he contended. "We already see some signs that supply and demand fundamentals will start to correct themselves in 2016."

El-Badri noted that global oil demand growth this year was expected to increase by around 1.3 million barrels/day, while non-OPEC oil supply was anticipated to contract by around 700,000 b/d.

"However, we do need to recognize that there is another important element to add to this picture — inventory levels," he said, noting that since the end of 2013, the five-year average for OECD commercial stocks had risen significantly — from a negative level of 85m b to a surplus today of over 300m b.

For the same period, there had also been a rise in non-OECD inventories, plus an expansion in some non-OECD strategic petroleum reserves.

"It is vital the market addresses the issue of the stock overhang. As we have seen in previous low oil price cycles, once this overhang starts falling then prices start to rise," professed El-Badri.

He said that, of course, some consumers may ask what the benefits were for them in seeing prices increase. "The key is in the longer term: we see the world needing more oil and this requires more investment."

El-Badri said OPEC saw oil demand increasing by around 17m b/d between now and 2040, reaching close to 110m b/d by then. And in terms of oil-related investment requirements, these were estimated to be around $10 trillion over this period.

"However, the current environment is putting this future at risk. At current price levels, it is clear that not all of the necessary future investment is viable," he said.

Challenges for oil markets

El-Badri said that apart from coping with the low-price environment, there were many other ongoing and related challenges for oil markets. These included the uncertain prospects for the global economy; excessive speculation and the role of financial markets; the impact of geopolitics; advances in technology and their impacts on exploration and production, as well as demand; and environmental concerns.

He mentioned that the meeting would look at some brief updates on the status of activities between the EU and OPEC, including a report and conclusions from the roundtable on the *'Petrochemical outlook: challenges and opportunities'*, as well as an update on a new joint study being undertaken on non-crude liquids.

"These developments further reinforce the cooperation between our two parties. By collaborating, sharing viewpoints and finding some common ground, we are able to advance our mutual understanding of each other.

"Given this, I am sure the EU-OPEC Energy Dialogue will continue to prosper in the years ahead," he concluded.

OPEC proves reliable ally in challenging times

— EC Commissioner

Despite the crude price fluctuations the international oil market has experienced since June 2014, OPEC has continued to be an efficient, reliable and economic supplier of oil.

That was the view put forward by Miguel Arias Cañete, Commissioner for Climate Action and Energy at the European Commission (EC), to the 12th High-Level Meeting of the European Union-OPEC Energy Dialogue in Vienna in March.

"I want to acknowledge this," he stated in his opening comments to the one-day meeting, which is held annually and alternatively in Brussels and Vienna.

"Moreover many OPEC Member Countries have grasped the low prices as an opportunity, rather than see them as an existential threat," he told assembled delegates.

He maintained that low oil prices were an opportunity to reduce subsidies and promote measures on energy efficiency and renewables' development.

"And from what I saw in Paris (at the COP21 climate talks in December 2015) many producing countries are now grasping those opportunities," he affirmed.

Clean energy target

Citing an example, he said that Gulf OPEC Member, the United Arab Emirates (UAE), was leading the renewable energy change in the Middle East.

"The 24 per cent clean energy target it has set itself for 2021 shows its commitment to a low-carbon future," he asserted. "Others should follow this example, and I am not only thinking about the oil-producing countries, but also about ourselves."

Arias Cañete pointed out that it was sometimes said that a low oil price environment made investment in efficiency or alternative fuels less attractive.

"But I think we should mainly think of it as an opportunity to get serious about removing environmental harmful subsidies. And we should start at home with this. Together with the Competition Commissioner, we are therefore looking closely at the situation in our member states," he informed.

"So the opportunities are there while the prices are low. And let us not forget that this opportunity might not last forever. When it comes to oil prices, it has always been a case of 'what goes down must come up'. And we must of course be prepared for this boomerang effect," he said.

Arias Cañete stressed that sooner rather than later, the market would eventually rebalance.

"At that stage, we might see oil prices rise again. When this happens it must be our interest that such a price rise does not come in the form of an excessive shock. And it must be our interest that we are prepared by continuing our efforts to be as efficient as possible in our consumption."

Arias Cañete said that in the current context of the energy markets, the continued close partnership between the EU and OPEC was more important than ever.

"And that is not something that we should take for granted," he declared, adding that he still remembered the effects of the oil crisis in 1973.

"Over 40 years later, in large part thanks to our strong partnership with OPEC, we have managed to avert such serious oil supply crises in Europe. "That is a real achievement when you consider that the EU is one of the largest importers of oil and refined products in the world. Our import dependency for oil in 2014 was 88 per cent and that is set to go up to above 90 per cent in the next decade."

Arias Cañete told the meeting that the energy landscape was changing fast. And as with any period of change, there was always an element of uncertainty and instability that went with that.

"That makes the continued good cooperation between the EU and OPEC even more important."

Arias Cañete stated that it was the need for stability in these challenging times that, for him, was the current theme of the EU-OPEC Energy Dialogue.

He observed that the energy landscape had changed significantly since the last EU-OPEC Dialogue in 2014.

The oil market had undergone substantial changes in those last two years. Prices had fallen from a June 2014 peak of $115/b to less than $30/b in January 2016. "And in 2015, we saw stock levels rising to well above the five-year average with demand far outstripping supply."

Arias Cañete noted that the past year had been a test for all producers and investors, who had to face up to the realities of a shifting global oil industry. And such market instability had obviously had an impact.

"We have seen a reduction of investment in oil exploration and production of 20 per cent in 2015 and we have seen rig counts falling dramatically, down from 1,600 in the United States two years ago to about 400 today.

"And in Europe we have already seen a reduction of refining capacity of around 2m b/d since 2008."

Arias Cañete pointed out that the EU and OPEC may have different views on what was an adequate oil price level, "but we probably agree that excessive oil price volatility and sharp price rises can be harmful for the economies of both the producing and consuming countries.

"We should aim at oil prices which would be competitive for our economies, not subject to excessive volatility and at the same time provide adequate revenue to the investors," he said.

Arias Cañete stated that the fall in oil prices was not the only change they had seen since the last EU-OPEC Energy Dialogue.

"Another major shift is that we have embarked on a managed transition to a low-carbon economy. We have set ourselves ambitious targets for cutting emissions, rising the share of renewables and improving our energy efficiency."

Miguel Arias Cañete, European Commissioner for Climate Action and Energy.

The EC Commissioner said the end of 2015 saw the most ambitious global climate agreement ever signed take shape.

"The Paris deal is the first-ever universal, legally binding global climate deal. It is also the first major multilateral deal of the 21st century. This shows that the international community is serious about tackling climate change and about accelerating decarbonization."

Arias Cañete said he could not stress enough the importance of the agreement being truly global.

"Many OPEC countries were at the forefront of the Paris discussions and are already adapting their energy systems to the new direction of travel. From our perspective, the agreement delivers on all of the EU's top priorities — it is a deal fit for purpose and fit for the future," he said.

Mitigate climate change

"This said, we must not lose track of the overarching objective to mitigate climate change and the aggregate effort is still not enough to contain global warming to well below 2°C. Implementation at a global level will be challenging," he maintained.

"Our attention now turns from promise to delivery. For Europe that means putting in place a plan of action to cut emissions by 40 per cent by 2030 while having at least 27 per cent of renewables in our energy system and improving our energy efficiency by at least 27 per cent.

"What all of that points to is that the transition to a low-carbon economy is now irreversible. And it shows that in the long run our economy will not be powered by fossil fuels as it still largely is today."

But Arias Cañete stressed that they also needed to be realistic: the transition would not happen overnight.

"We won't have 100 per cent renewables tomorrow and it will take some time to tap the significant potential we still have to become more efficient in our energy use," he proclaimed.

"The truth is that even if we meet our 40 per cent target for emission cuts by 2030, we expect that the share of oil in our primary energy mix will still be around one-third in 2030.

"True, oil consumption will have to decline more steeply after that to reach our mid-century targets, but oil will retain a significant role in our energy system for quite some time to come.

"So, in the meantime, we have to do everything we can to ensure a secure and competitively priced supply of oil and oil products," he stated.

Arias Cañete went on to speak about the EU's policy agenda in terms of delivering on its Energy Union priorities. It had already adopted a Security of Supply Package to help protect it from energy crises and later in 2016 it would update the remaining part of its energy legislation and come forward with proposals for a strong governance scheme for the Energy Union.

He said energy efficiency and renewable energy were crucial parts of the EU's efforts to decarbonize whilst also improving energy security. Tackling the challenge of the progressive decarbonization of the region's transport sector was also a priority.

"... the truth is, we have some catching up to do and significant emission reductions will be needed in the transport sector if we are to reduce emissions by at least 80 per cent, as we have said we will by 2050."

Arias Cañete revealed that proposals later this year would outline a comprehensive set of measures to decarbonize transport covering all modes of transport.

He said it was also important to maintain a competitive refining sector in Europe to avoid overdependence on imported refined petroleum products and to be able to process crude oil stocks with sufficient flexibility.

"We have a constant dialogue with our refining industry through the EU Refining Forum to ensure that the EU regulatory framework is fit to the needs of a competitive EU refining sector," he stated.

In conclusion, Arias Cañete said that in the long term there was no hiding from the fact that decarbonizing a heavily oil dependent economy would have an impact on the oil sector.

"While the EU will continue to be dependent on oil in the decades to come, our commitment to a low-carbon future means that our relationship will evolve during the course of this century.

In again stressing the importance of the EU's continued partnership with OPEC, Arias Cañete pointed out that in times of growing energy security concerns and continued import dependence, the Organization had proved a reliable ally — even in the most challenging circumstances.

"That has helped us avoid the mistakes and crises of the past.

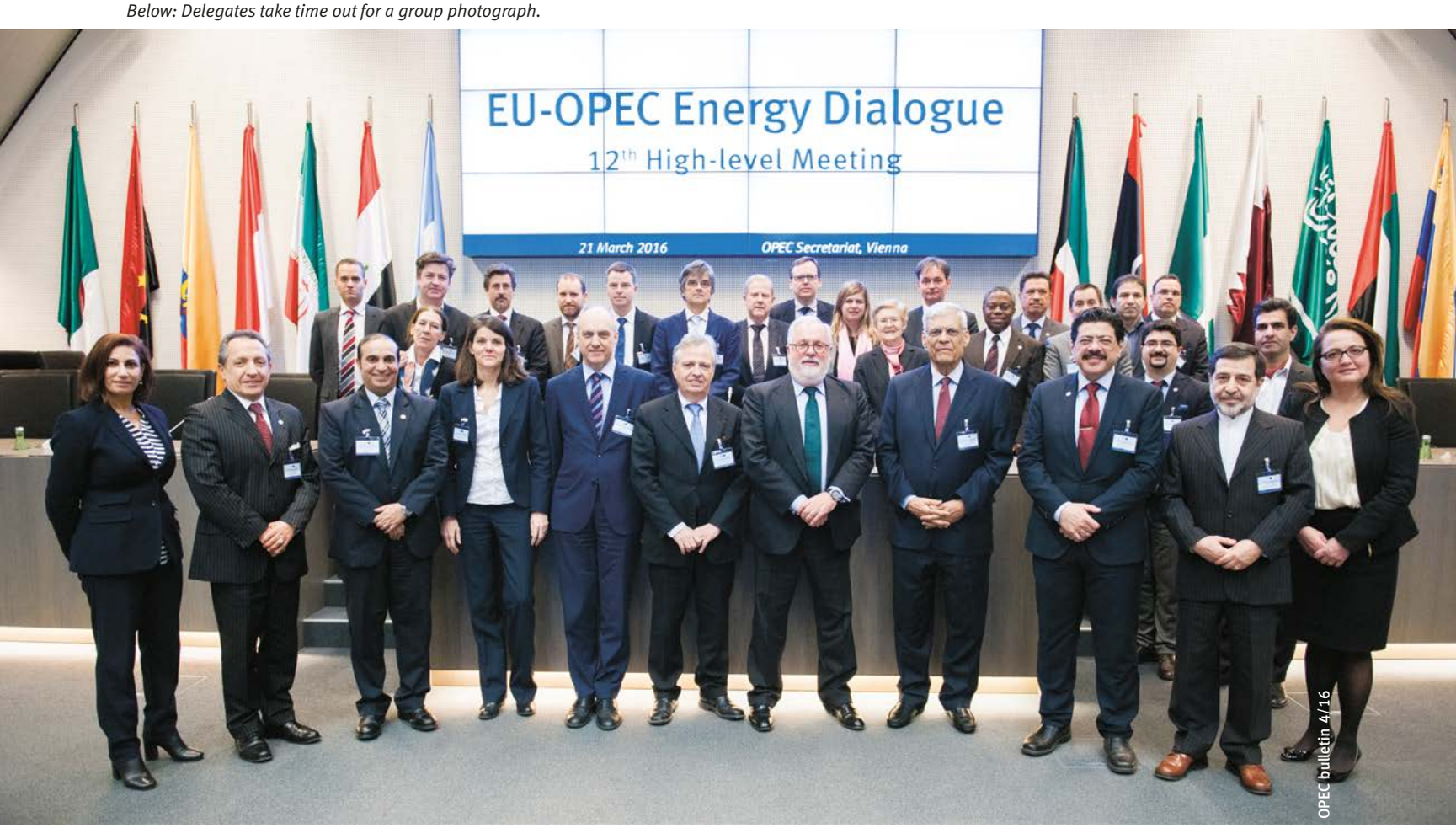
"Yes, those circumstances will continue to change. Europe will continue to be ambitious on climate and energy. And yes, we are committed to a clean energy transition.

"But that transition will not happen at the click of a finger. And in the meantime our job is to ensure that we have the stability we need for our economy to thrive.

"And that is why the EU-OPEC partnership is so important and why I look forward to continuing our open and fruitful dialogue today and in the years ahead," he concluded.

Above: The meeting took place in the OPEC Secretariat's main conference room.

Below: Delegates take time out for a group photograph.



OPEC concerned about the oil market's "many uncertainties"

OPEC has highlighted its concern over the "many uncertainties" that surround the international oil market and which threaten the accuracy of its demand forecasts going forward.

The Organization's Secretariat in Vienna has pointed out that its demand forecasts for 2016 are subject to many uncertainties, mainly the pace of economic growth in major oil demand centres, but also the removal of subsidies in oil-producing countries, mild weather in the northern hemisphere, and the diverse effects of oil prices in different regions.

Global oil demand growth rising

Its latest projections show global oil demand growth rising by around 1.20 million barrels/day in 2016, representing a minor downward revision of 50,000 b/d from previous expectations, and mainly reflecting the slower economic momentum in Latin America. Total oil consumption is projected to reach 94.18m b/d in 2016.

Last year, world oil demand is slated to have grown by 1.54m b/d to an average of 92.98m b/d.

In a special report in the Oil Demand section of the April edition of its *Monthly Oil Market Report (MOMR),* OPEC examines one by one the sources of uncertainty identified for this year.

Firstly, it points to economic developments in Latin America and China, which it said were a concern.

"There is great uncertainty as to whether weakening economic activity in Latin America and signals of a slowdown in China will be reflected in oil demand data, especially for China.

"So far, consumption data for industrial fuels and middle distillates in particular, are reflecting this slowdown in both regions."

It said that, in Latin America, uncertainties for 2016 pointed downward, as the economic environment in Brazil was projected to remain rather slow for the rest of the year.

"In contrast, the Olympic Games should bring more demand from the transportation and power generation sectors in that country, with a particular focus on oil demand in the second and third quarters of 2016."

Elsewhere, said the article, economic development suggested a brighter outlook for certain countries, such as India and South Korea.

Uncertainties for oil demand in India were currently leaning mainly towards the upside as overall economic activities were projected to remain positive, supporting not only industrial and manufacturing fuels led by middle distillates, but also transportation fuels.

"In South Korea, positive assumptions for economic development, as well as expansion in the petrochemical and transportation sectors, support this optimistic outlook," it affirmed.

Secondly, said the report, the impact on oil demand so far could not yet be clearly attributed to the removal of subsidies in some oil-producing countries, especially in the Middle East.

Subsidies reduced

Oil demand data from Saudi Arabia in the first two months of 2016 was lower-than-anticipated. However, said the report, this could be due to the first quarter being a low-demand season, as power generation fuel requirements for heavy distillates reach a peak in the summer, when air conditioning usage intensifies.

"Since subsidies were reduced in various countries around the region, including the United Arab Emirates (UAE), Kuwait, Oman and others, overall projections for oil demand in the Middle East will be strongly dependent on the economic performance of major oil-producing countries in the region, as well as the success of measures to mitigate the impact of lower oil prices," it stated.

Thirdly, observed the article, warmer weather conditions in the northern hemisphere had already reduced consumption of light/middle distillate products in the first quarter, with lower heating fuel requirements being observed in the United States, Canada and Europe.

"Possible changes in weather conditions, when compared with anticipated normal fourth-quarter temperatures, will introduce uncertainty in middle distillate requirement projections going forward."

Elsewhere, said the article, a warmer summer in the Middle East and Latin America should positively impact power generation fuel requirements.

Lastly, it said, sharp changes in oil prices tended to create a high degree of uncertainty going forward as they not only affected requirements by end consumers — depending on what degree the price impact was passed on to consumers — but also overall economic activity of the producing nations.

It said a case in point was road transportation fuel demand from the US and, to a lesser extent, Europe, where there was significant reaction to the low oil price environment in 2015.

Downward revisions

"Extra support is projected for transportation fuels over the summer driving season should prices remain at 2015 levels," it maintained.

"With this in mind, current negative factors seem to outweigh positive ones and possibly imply downward revisions in oil demand growth, should existing signs persist going forward," it concluded.

NB: A report on the feature article contained in the April MOMR, which gives an outlook for global oil product markets in 2016, as well as the publication's market highlights, can be found on page 63.

Algeria's Sonatrach committed to ambitious investment plan

Despite the challenging times, brought on by lower crude oil prices, Algeria's national energy company, Sonatrach, is determined to advance with its five-year investment plan, which aims to boost the OPEC Member Country's oil and gas production.

The In Salah gas facilities form a very important part of Algeria's petroleum development plans.

In its bid to expand the nation's production capability to meet future growing energy demand, the Algerian government has earmarked some $90 billion for investment in the petroleum sector for the period 2015–19.

The majority of this is set to be spent in the oil sector with under a third of the amount budgeted for developing domestic natural gas fields.

Sonatrach Chief Executive Officer, Amine Maazouzi, recently reaffirmed the company's commitment to the investment programme plan, stating that an increase in hydrocarbons output was already scheduled for this year.

Industry sources have pointed out that the company is fully aware that it needs to invest heavily in its domestic operations if it wants to stem a decline in production and remain a significant oil and gas exporter.

Sonatrach is looking to boost its hydrocarbons output from the beginning of 2018 to reach 225 million tonnes of oil equivalent, compared to 195m toe in 2013.

Official figures show that Algeria's oil and gas reserves rose by five per cent from 4.2bn toe in 2010 to 4.4bn toe in 2014.

According to OPEC's *2015 Annual Statistical Bulletin (ASB),* the country's proven crude oil reserves in 2014 stood at 12.2bn barrels. Its oil production in 2014 stood at 1.19m b/d, down by 0.8 per cent from the 1.2m b/d recorded in 2013.

The data showed that the country's natural gas reserves in 2014 stood at around 4.5 trillion cubic metres.

Upstream and downstream projects

Meanwhile, Sonatrach recently awarded contracts for major upstream and downstream projects, as it seeks to boost oil and gas output, while reducing costs.

According to a *Reuters* report, Sonatrach was seen shifting its overseas investment strategy to offer foreign firms direct negotiations to buy stakes in 20 of the country's oil and gas fields.

It quoted an official as saying that direct negotiations were a "more efficient, less expensive, faster, and less bureaucratic approach" to securing the development contracts it needed. Sonatrach was already in such talks with Italian oil major, ENI, and several other foreign companies.

Sonatrach, continued the *Reuters* report, was now focused on maximizing output at its mature fields and seeking foreign partners for technology. That effort centred on Hassi Massoud, Hassi Berkine and Illizi in the south-west and west of the country.

It revealed that Algeria was also in talks with European Union officials on staging a summit in its capital, Algiers, in May to look at energy investment opportunities in Algeria, particularly concerning gas supplies.

Southern gas fields already in development with foreign partners were slated to go online through 2018. The government has announced it expected the country's gas output to rise by 13 per cent by 2019.

Of significance in this area, the In Amenas gas plant, which produced 11 per cent of Algeria's gas before it was attacked in 2013, is now expected to be back in full operation this month.

Its return would result in gas production increasing from 16m cu m to 20m cu m/day.

Ecuador signs agreements to boost oil output from mature fields

Ecuador has signed a series of agreements that will help to sustain the production lives of the OPEC Member Country's mature oil fields.

According to the Office of the Ecuadorean Vice President, Jorge Glas, the nine oil deals have been reached with three consortia led by Schlumberger, Halliburton and the China Petrochemical Corporation (Sinopec).

Glas told the media that, under the terms of the agreements, the companies involved were committed to boosting the total output of the fields by some 30,000 barrels/day by 2018.

Ecuador's state-run energy company, Petroamazonas, announced that the three oil service companies were set to invest around $1 billion in developing the fields in question in the country's oil-producing Amazon area.

"The international companies are taking on the risk of the investments and the Ecuadorean state, via Petroamazonas, will only pay for the execution of production increases," Petroamazonas was quoted as saying in a statement by the *Reuters* news service, adding that the payment rate would be based on the price of the United States benchmark crude, West Texas Intermediate (WTI).

Production expected to rise

It said that under the deal, production was expected to rise by 30,000 b/d from the current 74,061 b/d by 2018.

According to official figures, Petroamazonas produced some 368,163 b/d of crude oil in March this year. Ecuador, the smallest Member of OPEC, had total production of around 552,000 b/d in March, data submitted directly to the OPEC Secretariat in Vienna showed.

"These contracts mark a very important step in our management because they manage to get running projects that are truly necessary to extend the life of mature fields," Jose Icaza, Head of Petroamazonas, was quoted as saying.

"Among other things, we have managed to ensure financial protection for the state during periods of low crude prices," he pointed out.

According to the news report, Schlumberger will run a consortium with Argentinian partner Tecpetrol, including the Eden Yuturi and Panacocha fields, the latter originally developed by Petroamazonas.

L–r: Jorge Glas, Ecuadorean Vice President; Eng Carlos Pareja Yannuzzelli, Minister of Hydrocarbons; and Jhon Reyes, Union Worker leader, attend the opening ceremony of a refurbished oil refinery in Esmeraldas.

Halliburton, in a consortium called Igapo, will run the Lago Agrio, Victor Hugo Ruales, Pucuna and Palo Azul oil fields, the last of which was formerly run by Brazil's Petrobras. Petrobras left Ecuador in 2010.

Sinopec and its local services unit will operate the Panaturi consortium of the Indillana, Yanaquincha and Limoncocha fields.

Icaza was quoted late last year as saying that the Tiputini heavy crude field would add another 20,000 b/d to the country's total output.

Under the new agreements, fees paid to the companies for the oil extracted will be between $10/b and $15/b, rising to $35/b if the price of WTI reaches $75/b.

Companies working in Ecuador switched from the previous production-sharing agreements to the current contracts in late 2010 and early 2011.

Indonesia in talks with Iran over securing energy deals

Indonesia, which at the beginning of this year reactivated its Membership within OPEC, is looking to strengthen its bilateral cooperation with fellow Member Iran, particularly in the oil and gas sector.

The move follows the recent removal of international trade and economic sanctions against Iran, one of OPEC's Founding Members and one of the world's most important oil producers.

Indonesia's OPEC Governor, Widhyawan Prawiraatmadja, has announced that a deal was imminent for importing Iranian condensate and liquefied petroleum gas (LPG).


Widhyawan Prawiraatmadja.

But he added that an agreement over crude deliveries was unlikely at the time being because Indonesia was in the market for sweet crude for its refineries, not Iran's sour oil grades.

A delegation of Indonesian oil officials was in Iran to negotiate several energy accords and there had been hopes of finalizing a short-term deal for 120,000 barrels/day of Iranian crude for a refinery in Indonesia's Central Java.

Future opportunities

However, Prawiraatmadja told reporters there would be "a lot of opportunities" for such agreements in the future.

"We have limited demand for crude," he was quoted as saying, adding that Indonesia was importing around 400,000 b/d of crude, of which 125,000 b/d was sour crude from Saudi Arabia.

According to Indonesia's Energy and Mineral Resources Ministry, Iranian crude oil would meet the specifications needed for Indonesia's Cilacap and Balongan refineries.

Prawiraatmadja pointed out that before Indonesia could give the green light to the import deal for Iranian condensates and LPG, the country's government would need to work out how to transfer funds to Iran.

"Clearly, Indonesia needs several things and I think its biggest need is LPG. Iran has an LPG surplus and if they can give us a better LPG price, we should automatically buy from Iran," he affirmed.

According to sources, Indonesia hoped to import up to three cargoes, or about 132,000 metric tons, of LPG from Iran in the second half of the year.

Pertamina has estimated that Indonesia's LPG consumption in 2016 will amount to 7.0m t, up from 6.3m t last year, of which 4.17m t, or 64.8 per cent, would be supplied by imports.

In February this year, during a bilateral meeting in Bogor, West Java, Indonesia and Iran agreed to cooperate in the upstream oil and gas sector, as well as in the exchange of data and technology.

Wiratmaja Puja, Director General of Oil and Gas at the Indonesian Ministry of Energy and Mineral Resources, revealed that Iran had offered to supply Indonesia with crude oil, condensate and LPG, as well as to help develop its domestic refineries.

In addition, the two countries agreed to develop human resources, as well as conduct joint research and development.

"All of these will be conducted through business-to-business deals. Pertamina (Indonesia's state energy firm) held a meeting in February with Iranian firms so that the purchase of crude and LPG can be realized soon," Wiratmaja was quoted as saying by the *Jakarta Post* newspaper.

Iran is looking to participate in the construction of an integrated refinery and petrochemical complex in Indonesia. The plant would have a capacity of around 300,000 b/d.

Stated Wiratmaja: "The total investment will reach $14 billion, including the petrochemical industry, but only $8bn without it."

The international sanctions against Tehran were officially lifted in January after the International Atomic Energy Agency (IAEA) released a statement saying that Iran had fulfilled all the measures required under its deal with six world powers.

Since the sanctions were lifted, many major oil companies have expressed keen interested in getting involved in Iran's oil and gas exploration and development.

Indonesia is also looking to do business with other OPEC Member Countries, including Iraq, Nigeria, Libya and Angola, in addition to non-OPEC Russia and Azerbaijan.

IR Iran lauds "stronger" position in OPEC after nuclear deal

The post-sanctions era in Iran has provided the country with an opportunity to achieve a more effective and stronger presence in OPEC and other international energy organizations, according to Dr Mehdi Asali, IR Iran's OPEC National Representative.

In an editorial published on the website of the Iranian business newspaper, *Donya-ye Eqtesad* on March 12, he said that, during this period, and free from international political pressures and considerations and solely based on economic logic, the main oil-consuming countries in the East and West saw their interests in collaboration with Iran, in order to ensure their short-term and long-term energy needs.

"Iran's massive oil and gas reserves, the country's stable situation and the capabilities of its downstream industries, constitute points of assurance for the execution of projects and long-term contracts of cooperation between the Islamic Republic of Iran and its foreign partners that are seeking to diversify their energy sources," he was quoted as saying in the article, entitled 'Strengthening Iran's position in OPEC'.

Asali, who is Director of OPEC Affairs and International Energy Fora at the Petroleum Ministry, said that, in addition, the attraction of foreign capital and the expansion of oil markets formed the links in Iran's national security for the upcoming years. "With the help of active diplomacy, we can use this new opportunity to strengthen Iran's position in OPEC, in other international energy organizations, and in the international oil and gas markets," he maintained.

Asali pointed out that during the "tumultuous history" of OPEC, as one of the Organization's five Founding Members, Iran had always played a key role in decisions by OPEC aimed at creating a balance in the international oil market.

"At difficult junctures in history, and when oil prices have sharply dropped, the Islamic Republic of Iran has always tried to protect our national interests through cooperation and interaction with collaborating Members in OPEC," he affirmed.

"In any case, our country's impact on decisions by OPEC and maintaining stability in oil markets have been influenced by international ties and the level of oil production in our country. Naturally, countries that have higher levels of oil production and oil and gas reserves, together with those that have access to more extensive markets, have wielded more influence."

He pointed out that Iran's oil industry officials had faced economic sanctions and numerous hurdles since the Islamic Revolution to the present day, but they had succeeded in managing them by any means possible.

"Nonetheless, it must be admitted that the extension of these sanctions to the banking and oil sectors by the United States and its allies in 2011, under the baseless pretext of Iran's unusual nuclear activities, meant that the country's expansion in various sectors, including the oil industry, encountered serious challenges."

He said that not only was Iran deprived of the massive European oil market and its exports to Europe were reduced from 800,000 barrels/day to zero, its customers in the Asian market were also forced to reduce their imports so as not to be subject to punitive measures by the US government.

"Under such conditions and in view of the reduction in the country's oil production to less than three million b/d, Iran lost its traditional position as OPEC's second-biggest oil producer and third-highest oil exporter."

Asali stated that with the drop in Iran's quota in global oil production, its influence and bargaining power in international oil markets was also diminished.

The absence of surplus oil production on the one hand, and a lack of access to the usual means of international transactions on the other, together with problems in advancing energy-based diplomacy in order to interact with other international players, seriously endangered the country's national interests in OPEC and in other international energy organizations.

"In the two months that have passed since the lifting of the sanctions on January 15, 2016, Iran has been inundated by foreign investors and buyers for the purpose of cooperation in the oil production and purchase sectors," he stressed.

Asali said that as a result of increasing the country's oil production to more than 4m b/d in the near future, signs of retreat by countries that had taken over its oil markets in recent years, would continue to manifest themselves even more.

"It appears that in order to create stability in the oil market, to prevent further losses, and to protect their revenues, major oil producers have no choice other than to accept Iran as a decisive player in the oil market, and one with which they must interact," he stated.

Asali contended that in the post-sanctions era, Iran had the ability to confirm its effective presence in international energy equations and maximize its interests by using the tools of increased oil production and the expansion of its downstream sector.

"Now that the oppressive sanctions have been lifted, conditions are rife to realize this important goal and to improve the Iranian nation's welfare," he professed.

Iraq exports first ever cargo of natural gas

Iraq exported its first ever shipment of natural gas in March in a long-awaited move that confirms the OPEC Member Country's intentions of being a serious gas producer and exporter to supplement its already established crude oil activities.

Workers set up a natural gas pipeline during a dust storm at Iraq's border with Iran in Basra, south-east of Baghdad.

The move represents a key development for the Gulf nation which is looking to develop its domestic economy and petroleum operations after years of conflict and unrest.

First natural gas shipment

Iraqi Oil Ministry spokesman, Asim Jihad, announced that the Basra Gas Company had exported the first natural gas shipment from the port of Umm Qasr in southern Iraq.

The shipment, comprising a cargo estimated to be around 10,000 standard cubic feet of gas in the form of condensates, was aboard a Panama-flagged gas carrier.

Jihad did not reveal how much the cargo was worth or who the buyer was, but he disclosed that the next cargo was due to be shipped soon.

The Basra Gas Company is a conglomerate between the Iraqi state-run South Gas Company, Royal Dutch Shell, and Mitsubishi.

It was in November 2011 that Iraq signed a $17 billion contract to form the company and jointly harvest, produce and sell natural gas from oil-rich Basra's three fields.

These fields comprise Rumaila, with reserves estimated at 17.8bn barrels; Zubair with 4.1bn b; and West Qurna Stage 1 with 8.6bn b.

The company captures the associated natural gas produced with oil from the fields, processing it mainly to fuel power stations and to be used as cooking gas for the domestic market.

According to OPEC's 2015 *Annual Statistical Bulletin (ASB),* in 2014 Iraq possessed proven natural gas reserves of 3.16 trillion standard cu m, along with its crude oil deposits of 143.07bn b. Petroleum revenues make up nearly 95 per cent of the Iraqi Government's budget.

The Basra Gas Company, which is 51 per cent owned by Iraq, has Shell with a 44 per cent interest and Mitsubishi with the remaining five per cent. It was formed to continue for 25 years.

As with other global oil producers, Iraq's economy has been hit by the sharp decline in global crude oil prices since 2014.

According to Oil Ministry figures, Iraq exported an average of 3.22m barrels/day of crude oil in February 2016. This was out of total production of around 4.46m b/d, as communicated directly to the OPEC Secretariat in Vienna.

Iraq's 2016 budget is based on an expected price of $45/b with exports of 3.6m b/d.

Kuwait signs, oil, gas, petrochemicals cooperation agreement with BP

Kuwait, which is looking to expand its oil production capability, has inked an agreement with international oil major BP to look at ways and means of developing the OPEC Member Country's oil, gas and petrochemical potential.

Nizar Mohammad Al-Adsani.

Bob Dudley.

The framework accord, which calls for the exploration of possible joint opportunities for investment and cooperation in future oil, gas, trading and petrochemicals ventures, was signed by Nizar Mohammad Al-Adsani, Chief Executive Officer of the Kuwait Petroleum Corporation (KPC), and his BP counterpart, Bob Dudley. According to a BP press release, the agreement paved the way for both companies to jointly invest and cooperate in oil and gas projects in Kuwait and globally.

"BP's commitment to Kuwait dates back to our participation in the discovery of the giant Burgan oil field in the 1930s and we are there today extending the life of the field," commented Dudley at the signing.

"We look forward to working with KPC to help the people of Kuwait realize the full potential of their nation's oil and gas resources and exploring new opportunities globally," he added.

Joint investment

BP said that in addition to enhancing oil and gas recovery from Kuwait's existing resource base, the agreement also included the intention to study opportunities for joint investment in future oil and gas exploration both inside Kuwait and globally.

"Other elements of the agreement cover possible future oil and gas trading deals including liquefied natural gas (LNG) trading and related ventures," said the release.

It noted that opportunities for cooperation and investment in midstream and petrochemical projects globally would also be considered under the accord, including potentially deploying BP's proprietary paraxylene technology as part of KPC's petrochemicals projects.

BP has long established relations with Kuwait, one of the Founding Members of OPEC.

The company was one of the founders of the original Kuwait Oil Company (KOC), which first discovered oil at Burgan in February 1938. Years later, BP was the first oil company to be invited by the Kuwaiti Government to assist in the redevelopment of Kuwait's oil industry after the 1990 Gulf conflict with Iraqi.

BP stressed on its website that, today, it remained committed to supporting Kuwait in the oil and gas industry. Since 1992, it had helped KOC to manage the North and West Kuwait oil fields.

In September 2014, BP signed a technical services agreement with the national oil company to bring BP's expertise in enhanced oil recovery to the Burgan oil field.

The company has a representative office in Kuwait and is actively engaged with the Government. It provides technical advisory support to KOC through the deployment of BP experts, who assist in enhancing production efficiency and reserves growth.

BP is also involved with the Kuwait Petroleum Corporation (KPC) in a portion of its tradable products.

BP lubricants — represented through the BP and Castrol brands — are long established in the country, with a considerable market share.

Meanwhile, the *Kuwait News Agency (KUNA)* has revealed that the country has made a discovery of light crude in the western part of the state.

It pointed out that the important find would help consolidate Kuwait's position as a main oil producer.

It said the new field, located in Jathathil, was expected to "constitute an important addition to the company's capacity production capacity and country's reserves from light crude and gas."

According to the OPEC *Annual Statistical Bulletin (ASB),* Kuwait has an estimated 101.5 billion barrels of proven oil reserves.

In March this year, it produced a steady 3m b/d of crude oil, according to data submitted to the OPEC Secretariat in Vienna. It is aiming to boost its production capacity to 4m b/d by 2020.

Nigeria in talks with oil majors to refurbish ailing refineries

Nigeria is looking to give a face lift to its ailing domestic oil refineries which are not producing to their optimum capacity, creating a shortage of domestic products which are instead having to be imported.

Dr Emanuel Ibe Kachikwu, Nigeria's Minister of State for Petroleum Resources.

According to Dr Emanuel Ibe Kachikwu, Minister of State for Petroleum Resources, the OPEC Member Country has held discussions over the situation with international oil majors Chevron, Total and ENI.

The West African country has seen a growing dependency on fuel imports as a result of the underperformance of its refining plants in Port Harcourt, Warri and Kaduna.

Kachikwu was quoted by *Reuters* as saying that Nigeria wanted to privatize the refineries within 12 months following the much-need maintenance work.

"We have gotten commitments from some of the majors. Agip has indicated interest to work with us on Port Harcourt, Chevron on Warri," he told the Nigerian Senate. "We are talking to Total on Kaduna."

Kachikwu, who is also head of the Nigerian National Petroleum Corporation (NNPC), has also said that even if the refineries in question performed to their optimum capacity, their production would still not meet local demand for petrol.

Quoted by the *Today* newspaper in Lagos, while briefing the Senate Committee on Petroleum (Upstream) on the lingering scarcity of petrol, he said the refineries, once repaired, could not even meet up to 50 per cent demand for the fuel, such was the consumption level.

The Minister pointed out that the design of the refineries had already created gaps in refining premium motor spirit (PMS) even if the refineries were to function at full capacity.

"The design of the Nigerian refineries was such that the component of PMS versus other products was almost a 50:50 per cent relationship. Most world refineries now provide PMS to about a 70 to 80 per cent ratio," he explained.

"So, even if the refineries work as being designed today, they will still provide less than 50 per cent of what we consume in this country," he added.

Kachikwu stressed that the Petroleum Resources Ministry was striving to utilize other sources of refining petrol while also depending on the coming on board of private refineries like the Dangote refinery.

He noted that the non-performance of the refineries was due to a number of factors, including fraud and lack of holistic maintenance. As a result of the long period of non-maintenance, a lot of components were ineffective.

"Over the last ten to 15 years, we have not done serious, conclusive turnaround maintenance of these refineries which average 30 to 40 years old and the equipment is dilapidated," he was quoted by the paper as saying.

The Minister said that even with the best top-level engineers, who were working night and day trying to make things work, the refineries were still not working effectively.

"We supply crude and they start for one day and then they shut down again because the CD unit has packed up. So, it is one thing after another.

"It is an ageing process and the right thing is that we need to holistically refurbish our refineries," he professed.

However, the Minister contended that refineries never die, and as such the nation's plants could be improved to work perfectly like others. Even older refineries around the world were still functional.

He said scrapping the refineries was not a solution to the problem. "The answer is to spend time, put in the right financial resources required, the right skills and get those refineries working. That's what we are focusing on now," he affirmed.

Kachikwu stated that part of the restructuring that was done was to give the refineries some level of autonomy so that they could prioritize their problems, seek third-party funding and ensure the plants worked.

UAE first Arab nation to ratify Trade Facilitation Agreement

The United Arab Emirates (UAE) has become the first Arab nation to ratify the World Trade Organization (WTO) Trade Facilitation Agreement (TFA), confirming its acceptance of the document.

Sultan bin Saeed Al-Mansouri *(pictured)*, UAE Minister of Economy, said the TFA represented one of the most important agreements within the WTO multilateral trading system.

It was the result of the Bali Ministerial Conference of 2013 and was the first agreement to be added to the multilateral trading system after 18 years of establishing the WTO, noted a report carried by the UAE news service, *WAM*.

It said the move was seen as a huge step in breaking the negation stalemate in the development negotiations round, which had been continuing since 2001, and a driver for the multilateral system going forward.

Al-Mansouri was quoted as saying that the agreement was in line with the UAE's policy of facilitating cross-border trading through simplification of procedures at borders and administrative requirements, providing information and electronic measures. This helped save time, reduce costs and improve customs and logistics standards.

WAM observed that the agreement contained provisions for expediting the movement, release and clearance of goods, including those in transit. It also set out measures for effective cooperation between customs and other appropriate authorities on trade facilitation and compliance issues.

It also contained provisions for technical assistance and capacity-building in this field.

Al Mansouri noted that administrative and customs procedures had always been a challenge to businesses and the most affected by them were small and medium enterprises (SMEs).

When the agreement entered into force, SMEs, which the UAE government was keen to support and promote, would benefit from unified standards and simplified procedures to boost their trade and investment activities, he explained.

Meanwhile, Abdullah Al Saleh, Under-Secretary for Foreign Trade Affairs at the UAE Ministry of Economy, said the TFA was expected to supplement the global economy by $1 trillion as a result of facilitating trade and easing border, customs and administrative procedures.

He added that the implementation of the agreement would reduce the costs associated with international trade and would benefit developing countries in general.

WAM stressed that the UAE had been one of the strong supporters of the agreement and had helped in the negotiations through collaboration with the Gulf Cooperation Council (GCC) and Arab countries and other members of the WTO.

The UAE Economy Minister headed the National Technical Team for Trade Facilitation that studied and assessed the impact of TFA on the UAE. The team included representatives from the Ministry of Economy, the Federal Customs Authority, the UAE Federation of Chambers of Commerce and Industry and all relevant organizations concerned with the facilitation of trade, added the report.

Al-Mansouri announced in February that the value of the UAE's non-oil foreign trade reached 1.75 trillion dirhams ($476.4 billion) in 2015, representing growth of ten per cent over 2014.

Following its diversification efforts, oil today contributes less than 30 per cent to the country's economy and the government is looking to reduce this figure to 19 per cent within the next decade.

The TFA will enter into force once two-thirds of members have completed their domestic ratification process.

In the course of his official duties, OPEC Secretary General, Abdalla Salem El-Badri, visits, receives and holds talks with numerous dignitaries.

This section is dedicated to capturing those visits in pictures.

March 14

Dipl Ing Mouddar Khouja (l), Secretary General of the Austro-Arab Chamber of Commerce, visited Abdalla Salem El-Badri, OPEC Secretary General.

March 17

Ms Rachel Kyte (l), Special Representative of the Secretary General and Chief Executive Officer for Sustainable Energy for All (SE4All), visited Abdalla Salem El-Badri, OPEC Secretary General.

March 18

Kairat Sarybay (l), Ambassador of Kazakhstan to Austria, visited Abdalla Salem El-Badri, OPEC Secretary General.

March 22

Etienne Dieudonné Ngoubou (l), Minister of Petroleum and Hydrocarbons of Gabon, visited Abdalla Salem El-Badri, OPEC Secretary General.

Dr Pierce Riemer (l), Director General of the World Petroleum Council (WPC); Dr Jozsef Toth (second l), President, WPC; and Ms Ulrike von Lonski (r), Director of Communications, WPC; visited Abdalla Salem El-Badri, OPEC Secretary General.

Students and professional groups wanting to know more about OPEC visit the Secretariat regularly, in order to receive briefings from the Public Relations and Information Department (PRID). PRID also visits schools under the Secretariat's outreach programme to give them presentations on the Organization and the oil industry. Here we feature some snapshots of such visits.

Visits to the Secretariat

January 20 Students from the Centro Universitário de Brasília (UniCEUB).

February 2 Students from the Ivan Franko National University of Lviv, Ukraine.

March 9 Group visit from the US Air War College, Alabama, US.

OPEC Secretariat again supports Vienna Science Fair

Lycée Français de Vienne

Mahid Al-Saigh (l), OPEC's Senior PR Assistant; and Ayman Almusallam (r), OPEC intern, man the Organization's stand at the Fair.

The OPEC Secretariat was once again in attendance at the 2016 Vienna International Science and Engineering Fair, which was held on March 12 at Lycée Français de Vienne.

The Organization, one of the leading sponsors of the popular event, also participated as an exhibitor. Its stand offered visitors to the Fair a wealth of information about OPEC, its history, its activities and its aims and objectives, as well as books, publications and various mementoes.

The Fair was once again organized by the Vienna Chapter of the Institute of Nuclear Materials Management (INMM), primarily for international high schools in Austria, but also schools in adjoining countries.

The aim of the Fair is to promote science and engineering subjects in schools and encourage the younger generation to pursue careers in different scientific and engineering fields.

Each participating student receives a certificate, while several gift awards are given to projects judged to be exceptional in each of the entry categories.

The organizers announced that this year eight schools from Austria, the Czech Republic, Slovakia and Bulgaria participated in the event with around 100 students presenting 60 projects. Prizes and awards were handed out during a special banquet held on March 17.

OPEC support appreciated

Carrie Mathews, Science Fair Sponsorship Coordinator, said in a letter to OPEC after the event: "OPEC's support for the Fair as an exhibitor was greatly appreciated by the students, as well as the teachers and organizers, who enjoyed learning more about OPEC's mission and Members."

She stressed that through its generous support, the Organization continued to "make a positive difference in the lives of the next generation of promising scientists and engineers — an investment today that will ensure a return for decades to come."

OPEC, OFID send condolences, pledge support for Ecuador following devastating earthquake

OPEC and its sister organization, the OPEC Fund for International Development (OFID), have responded quickly to the devastating earthquake that hit Member Country, Ecuador, in April.

Figures show that the 7.8-magnitude quake, which struck the country's Pacific Coast area at around 7pm on Saturday, April 16, killed more than 650 people. Officials said that a further 4,600 were injured. The numbers of dead and injured are still expected to rise as recovery efforts are still ongoing.

Local reports said damage from the quake was widespread throughout the country, although the hardest-hit area was the coastal province of Manabi, which has a population of around 1.5 million.

It was here that the cities of Manta, Portoviejo and Pedernales, a popular tourist destination, saw the most devastation. Well over 200 people are thought to have died in this region alone.

Sincerest condolences

The OPEC Secretariat was quick to express its sincerest condolences to the government and people of Ecuador following the disaster, which, according to the United States Geological Survey, was the worst earthquake to hit the South American country since March 1987, when a 7.2-magnitude quake killed 1,000 people.

OPEC Secretary General, Abdalla Salem El-Badri, said the thoughts and prayers of the Secretariat and Organization went out to the country and the many families and friends affected by the catastrophe.

"Ecuador is a much valued Member of OPEC and I would like to express the Organization's solidarity with the country at this most difficult time," he said in a message place on the Organization's website.

The OPEC Secretariat, based in Vienna, Austria, also launched an internal appeal to staff for much-needed cash donations for Ecuador through its Social Committee.

All the collected funds will be conducted through the Embassy of Ecuador in the Austrian capital.

Meanwhile, OFID in a "gesture of sympathy and solidarity to its Member Country Ecuador" has approved a $400,000 emergency grant for the country in its time of need.

This will be used to help procure essential relief supplies and support emergency operations conducted by the Ecuadorian Red Cross. The grant will be channeled through the International Federation of Red Cross and Red Crescent Societies (IFRC).

The IFRC launched an emergency appeal to support the humanitarian operations of the Ecuadorian Red Cross. In response, the Red Cross Red Crescent Movement, UN agencies, governmental and non-governmental organizations (NGOs) have been working together and also in coordination with local authorities to bring relief to affected areas.

OFID, in cooperation with the Ecuadorian Embassy in Vienna, also plans to host a benefit concert for the country on May 11 to help raise funds for the earthquake victims.

Damage to Ecuador's roads during the earthquake caused difficulties in getting much needed supplies to the affected areas.

Reuters

People organize humanitarian aid for victims of the earthquake that struck off the Pacific coast, in Quito, Ecuador.

In a letter to Ecuadorian President, Rafael Correa, OFID Director-General, Suleiman J Al-Herbish, expressed his deep sorrow over the disaster.

"We share, with genuine feeling, the pain afflicting families who have suffered the loss of loved ones and with those who have lost their property in these tragic circumstances.

"Please accept, Excellency, this message as sincere testimony of our solidarity with you, with the Government and the people of Ecuador. I beg you to convey to the families of the victims our heartfelt condolences," added Al-Herbish.

Ecuador was re-admitted as an OFID Member Country in June 2014 after a break of almost 21 years. The Latin American country suspended its membership in December 1992; its rejoining restored the number of OFID Member Countries to 13.

In Ecuador, the country's President, Rafael Correa, who was at a Vatican conference when the earthquake hit, has toured the affected areas, offering his support.

Six of the country's provinces were immediately placed under a state of emergency. Some 10,000 soldiers and 4,600 police officers were deployed to help in the rescue efforts, setting up mobile hospitals and temporary shelters.

Local sources have said that getting essential supplies and rescue personnel to the affected areas was a particular challenge with many roads suffering severe damage, restricting access.

However, the international response has been speedy with much-needed aid pouring into the country, particularly from neighbouring countries, including Colombia, Chile, Peru and fellow OPEC Member Venezuela.

The United Nations also arranged for a major aid airlift to be made to the country, while private aid organizations also rallied their support.

Ecuador, which joined OPEC in 1973, suspended its Membership in 1992, but rejoined in 2007.

Ports of call

Key harbours in OPEC Member Countries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Seaports play a significant role in the development of the export and import industries of any nation. Enhancing sea trade is a strategic objective that is pursued by all economies with access to international waters, developed and developing countries alike. Through scrutinising economic literature, the importance and benefits of such trade to registering healthy current account balances is most evident. Hence, seaports are seen as essential for helping to elevate growth and boosting economic development.

Moreover, the oil sector is a predominant example of an industry that relies heavily for its operations on huge harbours and considerably large sea vessels. This dependence is triggered by the need to transport massive amounts of crude oil, petrochemicals and refined products to a wide range of geographical locations worldwide on a daily basis. OPEC's 13 Member Countries follow the above-illustrated narrative to a great extent, as they are oil producers and net exporters.

In this article, OPEC intern ***Ayman Almusallam*** *takes a look at the primary and critical oil terminals situated in OPEC Member Countries.*

Algeria

Port of Arzew

Arzew port is one of the most vital harbours for the Republic of Algeria, which joined OPEC in 1969. It is located in the coastal city of Arzew, which is 40 kilometres away from the city of Oran. The harbour is situated in the Arzew administrative district of Oran Province.

Following the liberation of Algeria in 1962, the port gained remarkable importance, becoming the nation's principal port for exports and imports, as well as a growing industrial zone.

Of note, great quantities of Algeria's liquefied natural gas (LNG) are exported through the port, in addition to crude oil.

Moreover, the port handles 62 per cent of the country's commercial activities related to cargo traffic and shipments, particularly oil and gas cargoes, according to a report carried by the Al-Nahar newspaper.

The harbour underwent major developments recently.

Angola

Port of Cabinda

Cabinda port is, at present, one of Angola's major harbours. It is found in the city of Cabinda in Angola's Cabinda Province, lying on the shore of the Atlantic Ocean. Its location in the north of the African OPEC Member Country is more than 1,000 km away from the capital city, Luanda.

With the strategic harbour being situated nearby strategic key offshore oil reserves, Cabinda port is a significant outlet/inlet for the oil industry of the Republic. Additionally, it plays a critical role in importing all essential commodities to the enclave.

The harbour was established in the late 19th century. In recent times, it has experienced major development in both size and capacity, strengthening its economic and commercial value to the nation, which has been a Member of OPEC since 2007.

Currently, the port provides a wide range of services, including oil-related facilities, repair and medical aid.

Ecuador

Port of La Libertad

La Libertad port serves as one of Ecuador's principal harbours. Being located on the shore of the Pacific Ocean, it has grown significantly in importance with regard to the South American country's imports and exports.

The port is situated in the west of the Republic in the canton of Santa Elena, which is found in the county of the same name.

Ecuador's first port for commerce and leisure generates, La Libertad accounts for a notable volume of import and export activities, resulting in the strengthening of the economy of the country, which joined OPEC in 1973, suspended its membership in 1992, before rejoining again in 2007.

Additionally, La Libertad represents one of the Republic's key oil harbours. The port offers various facilities to visiting vessels, such as oil services, fuel tanking, repairs, and medical support.


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Indonesia

Port of Tanjung Priok

Indonesia's Tanjung Priok port, or as it is commonly referred —the port of Jakarta —is one of the busiest and most developed harbours in the Asian archipelago.

The harbour is situated in the sub-district of Tanjung Priok, which is part of North Jakarta district, located in the Southeast Asian country's capital, Jakarta.

The port of Jakarta plays a significant economic role domestically and internationally for Indonesia, which became an OPEC Member in 1962, suspended its Membership in 2009 and rejoined the Organization in 2016. Additionally, the harbour is administrated by the Indonesian Port Corporation (IPC).

The key port is responsible for managing 50 per cent of Indonesia's cargo traffic, including, but not limited to, crude oil and petrochemical products. It also handles 30 per cent of the country's non-petroleum shipments.

Moreover, the harbour is undergoing notable developments that are expected to be completed by 2018, in order to enhance its capacity and underpin the Republic's logistics chain. Noteworthy, the port consists of 20 varied terminals.

Port of Tanjung Priok, Indonesia.

IR Iran

Kharg Oil Terminal

Kharg oil harbour is one of the primary and crucial offshore deep-water ports in the Islamic Republic of Iran, one of the five Founding Members of the Organization in 1960.

Located on the continental island of Kharg in the Gulf, the island is situated 25 km away from continental IR Iran.

Furthermore, it is less than 500 km away from the Strait of Hormuz. Kharg is governed by IR Iran's Bushehr Province, the nearest coastal area to the island.

The significance of the strategic port is derived by the remarkable quantities of oil exported through it, as it is acknowledged as the country's principal harbour for crude oil and refined product exports.

In preparation for the post-sanctions era, the maximum export capacity of the port has been expanded to reach six million barrels/day, according to a report carried by Press TV.

IRNA, the Islamic Republic's national news agency, has reported that 90 per cent of the country's crude oil is exported through Kharg port.

Iraq

Al-Basrah Oil Terminal

Al-Basrah oil terminal is a strategic key offshore deep-water port for Iraq. The Founding OPEC Member's primary export harbour lies on the shore of the Gulf beside its sister port, Khor Al-Amaya oil terminal.

Al-Basrah port is situated 50 km away from the southeast of Al-Faw Peninsula and more than 100 km from the city of Al-Basrah.

The port is estimated to handle 80 per cent of the country's gross domestic product (GDP) and is the sole export terminal for crude oil and petrochemical products produced at the Southern Refinery. Formerly, it was known as Mina Al-Baker oil terminal.

The construction process of the harbour was initiated in 1974 and completed in 1975. In 2003, significant developments were carried out to boost the harbour's capacity. The current daily transfer capacity of the port has reached three million barrels.

Ras Tanura, Saudi Arabia.

Kuwait

Mina Al-Ahmadi

Al-Ahmadi port is a significant Kuwaiti oil harbour found in Al-Ahmadi governorate, a zone dedicated to the well-established oil industry of the Founding OPEC Member Country between Fahaheel village and Al-Shuaiba.

The port is situated in the south of the Kuwaiti capital, Kuwait City. Notably, it hosts the headquarters of the country's upstream crude oil concern, the Kuwait Oil Company (KOC).

The area of Al-Ahmadi was established in 1946, whereas Kuwait's first oil harbour was constructed in 1949. Furthermore, the port's operations are restricted to oil-related activities.

The harbour of Al-Ahmadi, which consists of natural docks and an artificial island, manages to deal with a great portion of Kuwaiti petroleum exports, including, but not limited to, crude oil and liquefied petroleum gas (LPG).

Libya

Sidra Port

The port of Sidra is a primary Libyan harbour situated in the borough of Sirte. It is approximately 23 km away from the west of Libya's Ra's Lanuf in Tripolitania County.

The port is named after the Gulf of Sidra, which it overlooks. Moreover, it is the country's largest oil port with a shipping capacity exceeding 400,000 b/d. On average, 200 vessels seek the services of the port every year.

The port's construction was completed in 1962. The crude and refined oil it deals with are transported to the harbour from the south of Libya through wide-ranging pipelines that measure 1,400 km in length.

Nigeria

Onne Port

The Nigerian port of Onne is a key harbour overlooking Bonny River and is located nearby Ogu Creek. The port is situated across the municipalities Eleme, Ogu-Bolo and Bonny. However, the biggest segment is found in the Eleme area.

The importance of the harbour is derived through its significant export capacity, as it deals with 65 per cent of the total exports of Nigeria, which became a Member of OPEC in 1971.

The establishment of the port was concluded in 1982. The harbour is one of Africa's most well-equipped ports. It is able to provide a variety of services to more than 1,500 ships a year on average, including loading, unloading, repairing and fuel tanking.

Moreover, the major service centre is deemed as the primary oil harbour in Nigeria. According to the management of the harbour, public and private partnerships have played a remarkable role in accomplishing the necessary advancements for the largest and deepest harbour in the West and Central African region.

Qatar

Ras Laffan

Ras Laffan is one of Qatar's best known harbours used for exporting crude oil and petrochemical products, in addition to natural gas.

The well-developed port, as it names suggests, is based in the industrial city of Ras Laffan, situated some 80 km away from the north of Qatar's capital, Doha, in Al-Khor Municipality.

The national energy concern, Qatar Petroleum, is the supervising corporation of the industrial city, as well as of the harbour. The port is distinguished for exporting enormous quantities of natural gas.

Qatar, which joined OPEC in 1961, possesses one of the largest artificial harbours in the world. Moreover, it runs the world's largest LNG export amenity facilitating the export of 30 million tons of gas per annum.

In 2011, the port serviced more than 1,500 vessels and its capacity has continued to expand remarkably since then, according to the Al-Arabiya newspaper.

However, Ras Laffan port is considered to be relatively new —the harbour's export operations commenced in late December 1996.

Saudi Arabia

Ras Tanura

Ras Tanura port is the primary oil harbour in the Kingdom of Saudi Arabia, an OPEC Founding Member. It is situated in the Eastern Province city of Ras Tanura and is located on a small peninsula extending into the Gulf.

However, a few artificial islands were made in order to facilitate the docking of oil tankers requiring deep-water harbours. Moreover, Ras Tanura is perceived to be among the largest of all international oil ports.

The port's construction was completed in 1939 and it is today responsible for exporting 90 per cent of Saudi Arabia's oil and petrochemical products.

A report carried by the Alyaum local newspaper has highlighted the remarkable service provided by the harbour, stating that it accommodates the needs and requirements of 2,000 vessels in various sizes, coming from different parts of the globe, on a yearly basis.

United Arab Emirates

Port of Jebel Ali

Jebel Ali port, or Mina Jebel Ali, is one of the busiest harbours across the globe. The deep-water port is found in Jebel Ali town, which is located around 35 km away from the southwest of Dubai, the most populated city in the UAE, which joined OPEC in 1967.

The Emirati harbour, situated on the Gulf, is considered the largest and busiest port in the Middle East. On a global scale, it is deemed as having the biggest man-made harbour.

The port's establishment was triggered by the need for enlarging the longstanding harbour of Rashid which required additional facilities, space and amenities to satisfy the rapid growth of trade and various industries in the country. The port was established during the second half of the 1970s. It is currently undergoing major developments aimed at expanding its capacity and improving the facilities available.

Venezuela

Puerto Miranda

Puerto Miranda is a significant oil harbour for the oil industry of Venezuela, one of OPEC's Founding Members in 1960.

Situated in the region of Zulia, it is located on the eastern part of Lake Maracaibo in the north-west of the nation, nearby the city of Maracaibo, Venezuela's second-largest city after Caracas, the capital city of the Republic.

The port is connected to the Gulf of Venezuela. Furthermore, it represents South America's largest crude oil harbour in terms of exports. It is operated by the national oil corporation, Petróleos de Venezuela, SA (PDVSA).

According to a report carried by the *Platts* news service, the port's capacity is estimated to exceed 500,000 b/d.

Of note, the harbour was built based on the recommendations of some major international oil firms, such as Shell, Esso and Gulf Oil. The construction and development of the port was kicked off in the late 1950s and carried on until its completion in 1961.

Port of Jebel Ali, United Arab Emirates.

Architect Zaha Hadid poses for photographs with her Dame Commander of the Order of the British Empire (DBE) medal, after it was awarded to her by Britain's Princess Anne during an Investiture Ceremony at Buckingham Palace, in London, November 2012.

Reuters

Zaha Hadid,

path-breaking, visionary architect, dies at 65

The world-renowned, Iraqi-born British architect left her unique imprint on the world's skylines, transforming the industry forever.

By Scott Laury

The architecture world lost one its brightest lights and prolific talents on March 31, 2016, when Zaha Hadid died at the age of 65 from a sudden heart attack in Miami, Florida, where she was a part-time resident. At the time, she was being treated in the hospital for a case of bronchitis contracted earlier in the week.

"It is with great sadness that Zaha Hadid Architects have confirmed that Dame Zaha Hadid, DBE, died suddenly in Miami in the early hours of this morning," her architecture firm announced in a statement. She is survived by her older brother, Haytham Hadid, of Beirut, Lebanon.

As soon as the news hit, accolades from her many colleagues and peers around the world extolling her career's work began to roll in.

Lord Richard Rogers, who achieved fame for his designs of London's Millennium Dome and the Pompidou Centre in Paris, told *The Guardian:* "She was a great architect, a wonderful woman and wonderful person. Among architects emerging in the last few decades, no one had any more impact than she did. She fought her way through as a woman. She was the first woman to win the Pritzker Prize."

Worldwide recognition

Indeed, Hadid was bestowed architecture's most coveted honour, the Pritzker Prize, in 2004. In addition, she won two RIBA Stirling Prizes for her designs of the MAXXI Museum in Rome and London's Evelyn Grace Academy.

Other awards included France's Commandeur de l'Ordre des Arts et des Lettres and Japan's Praemium Imperiale. In 2012, Hadid was made a Dame Commander of the Order of the British Empire. She was also appointed Honorary Member of the American Academy of Arts and Letters and Fellow of the American Institute of Architecture.

This year, she became the first woman to receive Britain's highest architectural award, the Royal Gold Medal. The award is given annually by the Royal Institute of British Architects (RIBA) on behalf of Her Majesty, the Queen, for an architect's distinguishing body of work that has influenced the advancement of architecture.

In announcing the 2016 award, Jane Duncan, RIBA's President and Chair of the Selection Committee, summed up Hadid's many achievements.

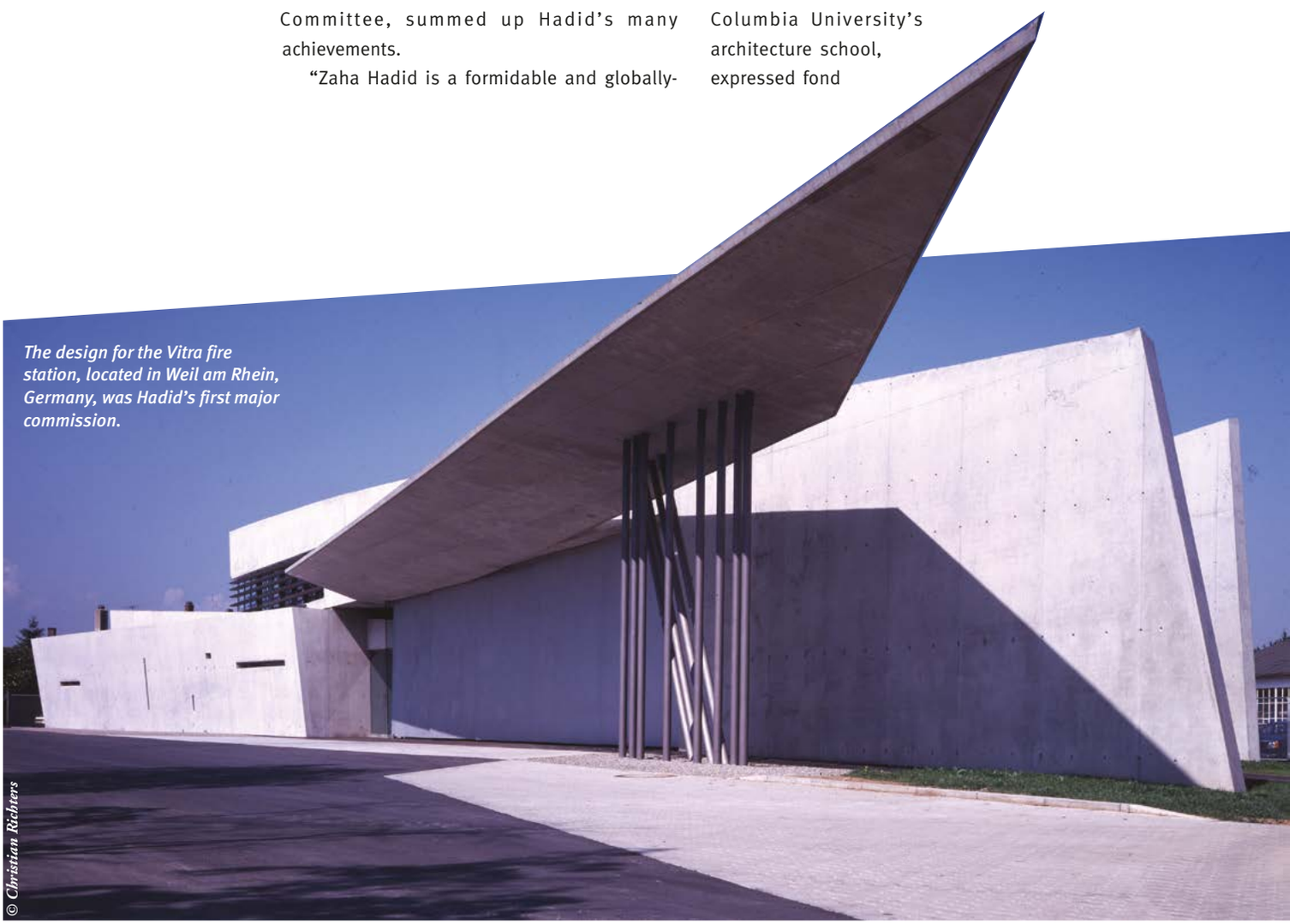
"Zaha Hadid is a formidable and globally-influential force in architecture," she said. "Highly experimental, rigorous and exacting, her work from buildings to furniture, footwear and cars, is quite rightly revered and desired by brands and people all around the world. I am delighted Zaha will be awarded the Royal Gold Medal in 2016."

Upon hearing of her passing, Duncan commented, "Dame Zaha Hadid was an inspirational woman, and the kind of architect one can only dream of being. Visionary and highly experimental, her legacy, despite her young age, is formidable. The world of architecture has lost a star today."

Active in academia

Hadid also held a variety of prominent academic posts around the world, including the Kenzo Tange Chair at Harvard University's Graduate School of Design, the Sullivan Chair at the University of Illinois School of Architecture, as well as studio teaching at Yale University, Columbia University and the University of Applied Arts in Vienna, Austria.

Amale Andraos, Dean of Columbia University's architecture school, expressed fond



The design for the Vitra fire station, located in Weil am Rhein, Germany, was Hadid's first major commission.

© Christian Richters

memories of her former colleague, stating: "She was bigger than life, a force of nature. She was a pioneer."

The Yale School of Architecture purveyed this comment: "Architecture today lost one of its greatest. Zaha Hadid has died. Zaha was the current Norman R Foster Visiting Professor at the Yale School of Architecture where she had taught regularly since 2001. She will be greatly, greatly missed."

Kudos from colleagues

Prominent architect and Hadid peer, Daniel Liebeskind, saddened to hear of her death, tweeted his condolences: "Devastated by the loss of a great architect and colleague today. Her spirit will live on in her work and studio. Our hearts go out."

Another colleague, Stirling Prize winner, Amanda Levete, expressed her admiration of the artist's work and her influence on the trade.

"She was an inspiration. Her global impact was profound and her legacy will be felt for many years to come because she shifted the culture of architecture and the way that we experience buildings. When my son was very young, Zaha showed him how to write his name in Arabic. It was the moment I realized the genesis of her remarkable architectural language. She was an extraordinary role model for women. She was fearless and a trailblazer — her work was brave and radical. Despite sometimes feeling misunderstood, she was widely celebrated and rightly so."

The Iraqi government also conveyed its sorrow, describing Hadid's passing as "an irreplaceable loss to Iraq and the global community."

The early years in Iraq

Zaha Hadid was born in Baghdad on October 31, 1950. Her father, educated in London, was an industrialist who also led a progressive party promoting democracy and secularism.

She attended a Catholic school with a diverse student body where French was spoken, and then went on to study mathematics at the American University in Beirut.

In 1972, she began her foray into architecture at the Architectural Association in London, which was known as a hub for experimental design.

Studying under the tutelage of famous figures such as Elia Zenghelis and Rem Koolhaas, Hadid began to develop her unique, intuitive approach to architecture.

Greatly influenced by Russian avant-gardists such as Vladimir Tatlin, El Lissitzky and Kazimir Malevich, her final project before graduating was entitled 'Malevich's

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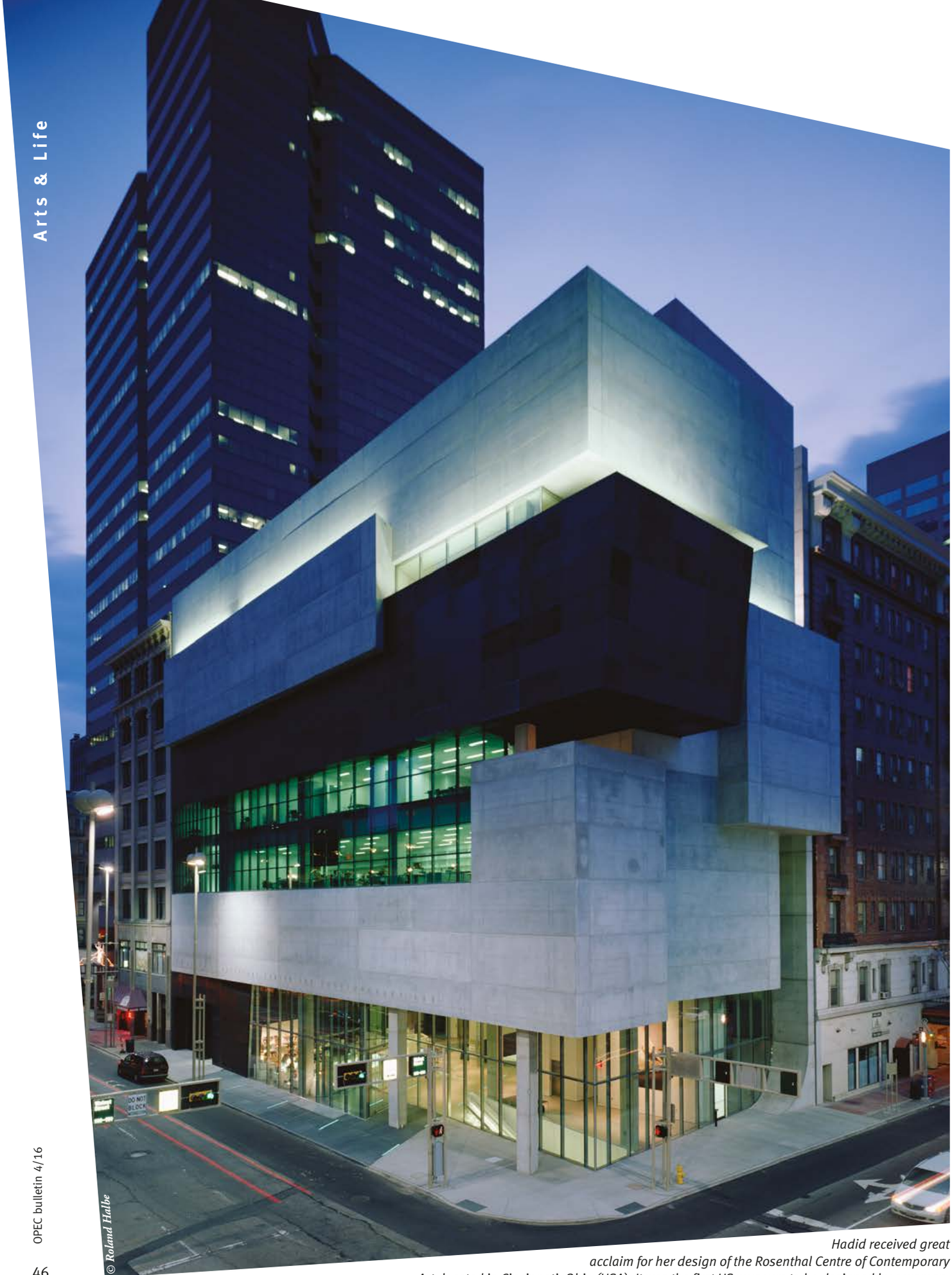
The Heydar Aliyev Centre, located in Baku, Azerbaijan, consists of a conference hall, a gallery and a museum. Hadid's curvy, modernistic design was a stark divergence from the rigid Soviet-era architecture that was the norm in Azerbaijan.



© Roland Halbe

Hadid received great acclaim for her design of the Rosenthal Centre of Contemporary Art, located in Cincinnati, Ohio (USA). It was the first US museum to be designed by a woman.

Tectonik' and envisioned a hotel being built on Hungerford Bridge over London's Thames River.

After graduating, she joined Rem Koolhaas' Office for Metropolitan Architecture in Rotterdam, a company reputed for its cutting-edge designs and its gifted young talents.

Starting her own practice

By 1979, she was back in London where she started up her own practice.

In the years that followed, her firm, Zaha Hadid Architects, went on to establish a name for itself worldwide for its groundbreaking architectural style.

Though she began to attract attention with her futuristic designs proposed for the Peak Club in Hong Kong (1983), the Kurfürstendamm 70 in Berlin (1986) and the Cardiff Bay Opera House in Wales (1994), Hadid's first major commission was a fire station located on the corporate campus of the Vitra furniture company in Weil am Rhein, Germany. The design's pointy, darting angles evoke an image of flight, reminding one of the supersonic Concorde at take-off.

Breakthrough to world fame

Building on the success and acclaim of the Vitra project, Hadid continued to stay busy with a host of prominent projects well into the new millennium.

Her 2003 design for the Rosenthal Centre of Contemporary Art in downtown Cincinnati, Ohio, was also hailed as a transformative, future-oriented building. It also has the distinction of being the first museum in the United States to be designed by a woman.

The project was highly acclaimed by prominent industry figures and the media, including former New York Times architecture critic Herbert Muschamp, who went as far as to describe it as "the most important American building to be completed since the end of the Cold War."

Overlooking the Pearl River, Hadid's modernistic, contoured, twin boulder design for the Guangzhou Opera House in China is the centerpiece of the city's cultural district.

Hadid continued to make her mark around the world with designs for a wide variety of commercial, cultural and sporting venues, including the BMW Central Building in Leipzig, Germany (2004), the Phaeno Science Centre in Wolfsburg, Germany (2005), the Italian National Museum of 21st Century Arts in Rome, Italy (2009), the Guangzhou Opera House in China (2010), the Aquatics Centre for the London 2012 Olympic Games (2011), the Heydar Aliyev Centre in Baku, Azerbaijan (2013) and the Al-Wakrah football stadium for the 2022 World Cup in Qatar.

Hadid's Al-Wakrah football stadium design has been proposed for the 2022 World Cup tournament in Qatar.

The spectacular Sheikh Zayed bridge, with its cantilevered road decks suspended from symmetrical, wave-like steel arches, has become a national landmark in the UAE since opening in 2010.

Strong presence in the Middle East

Earlier this year, in an article entitled "A Modern Day Renaissance in the UAE," the *OPEC Bulletin* featured one of Hadid's latest works, a performing arts centre, which was designed for Abu Dhabi's vast and splendid Saadiyat Cultural District. When completed, the District is set to become a magnet for arts and culture in the Middle East.

Hadid was joined by the crème de la crème in world architecture to design Saadiyat's museums. They are all Pritzker Prize winners and include Jean Nouvel (Louvre), Frank Gehry (Guggenheim), Lord Norman Foster (Zayed National Museum) and Tadao Ando (Maritime Museum).

The *Bulletin's* coverage highlights Hadid's futuristic and organic design for the spectacular performing arts centre.

"Hadid describes the futuristic structure on her website as 'a sculptural form, emerging naturally from the intersection of pedestrian pathways within a new cultural district — a growing organism that spreads through successive branches which form the structure like 'fruits on the vine'.

"From above, the building almost appears to be a sting ray or other type of sea creature with a long tail slithering its way forward, poised to plunge into the Gulf's turquoise waters. The glass and lattice work facade of the building resembles leaves and branches, further developing the museum's thematic connection to the natural world."

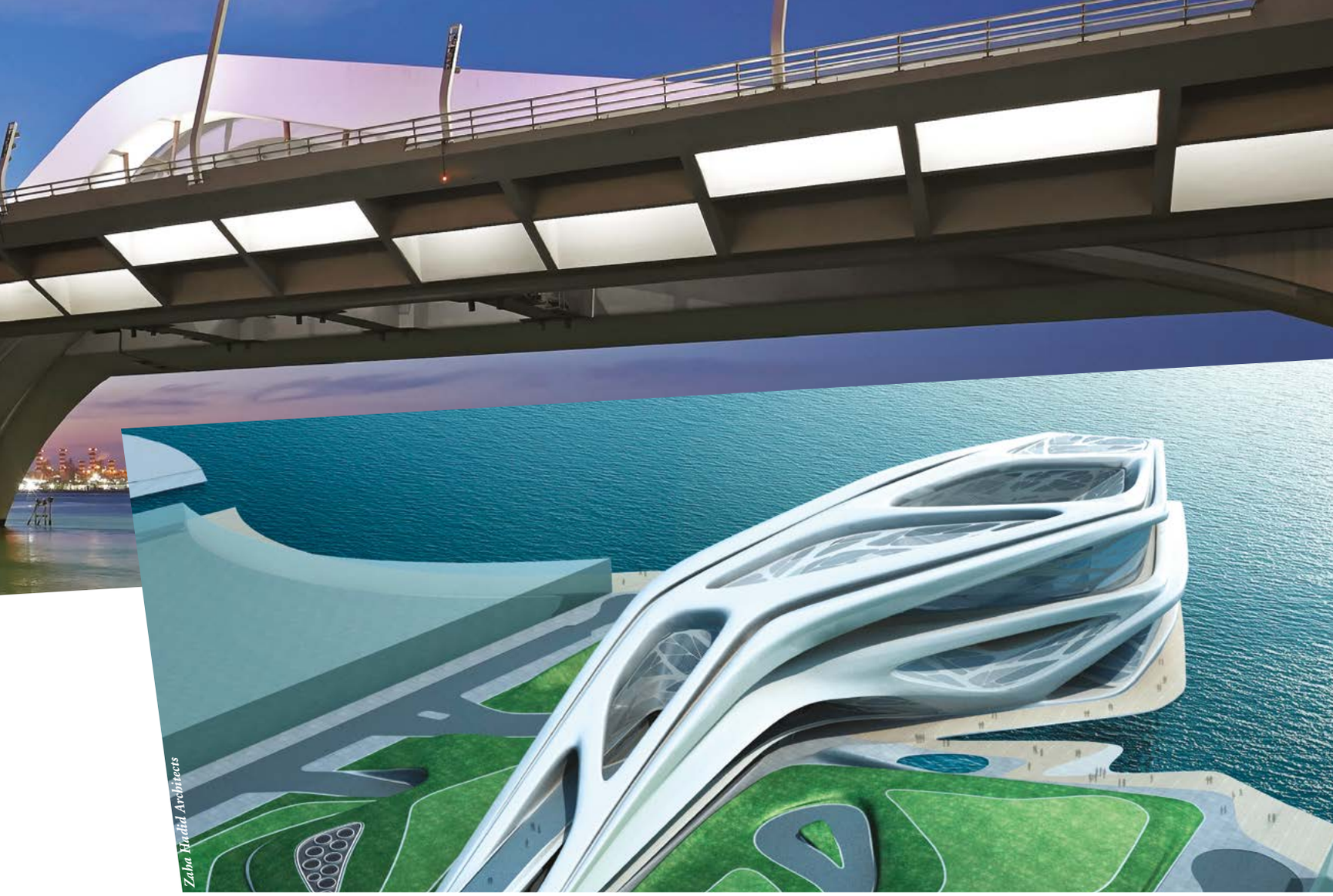
Hadid also designed Abu Dhabi's signature Sheikh Zayed arch bridge named in honour of former President Sheikh Zayed bin Sultan Al Nahyan, the UAE's principal founding father.

Spanning 842 metres, the bridge's undulating, curvy, modernistic design brings to mind the rolling sand dunes of the nearby desert landscape.

In Riyadh, Saudi Arabia, she designed the King Abdullah Petroleum Studies and Research Centre (KAPSARC), as well as the King Abdullah Financial District Metro Station, which is currently being constructed.

KAPSARC, founded in 2010, is an independent, non-profit institution that focuses on research in energy economics, policy, technology and the environment.

The new Hadid-designed Centre was inaugurated in January this year with Saudi Arabia's highest officials in attendance: the Custodian of the Two Holy Mosques, King Salman bin Abdulaziz Al Saud, along with



The Performing Arts Centre was designed by Hadid for Abu Dhabi's Saadiyat Cultural District.

The ultra-modern King Abdullah Petroleum Studies and Research Centre, located in Riyadh, Saudi Arabia, was inaugurated in January 2016.

Zaha Hadid Architects

HRH Mohammad bin Salman bin Abdulaziz Al Saud, Saudi Deputy Crown Prince and Defense Minister; Ali I Naimi, Minister of Petroleum and Mineral Resources and KAPSARC's Chairman of the Board; and Khalid A Al-Falih, Minister of Health and Chairman of the Board of Saudi Aramco.

In Jordan, inspired by the ancient city of Petra, the country's world wonder, Hadid submitted a visionary design for the King Abdullah II House of Culture and Art, which is to be located in Amman. The building is a play on the natural process of erosion, which shapes and reshapes the building's fluid and winding contours.

In Dubai, Hadid proposed a cutting-edge, organic design for the Financial Exchange Building, to be located in the heart of the new waterfront business district.

The structure, which, from above, resembles a flower petal blossoming in four directions, would house the trading floor as well as retail and entertainment facilities.

In the Sharjah Emirate of the UAE, Bee'ah, the Middle East's leading environmental and waste management company, commissioned Hadid's firm to build its new headquarters building. Hadid was selected after an international architecture competition was held in 2013. The low-to-the ground, wave-like design blends in harmoniously with the surrounding desert topography.

Back to her roots

One of Hadid's more recent designs took her back to her native land of Iraq, with a spectacular 170-metre high futuristic office tower on the banks of the Tigris River to house the country's Central Bank.

The geometric, fluid design of the tower and the ground-floor extension can clearly be identified with Hadid's unique brand of architecture. Indeed, it comes as no surprise that she has been termed in the industry as "the queen of the curve."

Hadid's website provides this description: "Rising from the sloping banks of the Tigris River in Baghdad, the design for the new headquarters of the Central Bank

Hadid, Iraqi by birth, was selected to design the new headquarters building for the Central Bank of Iraq, which will be located on the banks of the Tigris River in Baghdad.

Situated in a historical district of Seoul, South Korea, the extravagant, ultra-modern Dongdaemun Design Plaza was created to be a cultural centre with art and exhibition halls, conference facilities, as well as a design museum and other design-themed attractions.

of Iraq (CBI) conveys the core values at the heart of the institution: Solidity, Stability and Sustainability."

At the agreement signing ceremony in February 2012 between Hadid and CBI held at London's Victoria and Albert Museum, CBI Governor, Dr Sinan Al-Shabibi, underlined the symbolic importance of the building for the country's future.

"The new building shall be a symbol of the Bank's role in the economic development of Iraq and a reflection of the determination to rebuild the country," he said.

In her comments at the event, Hadid expressed her honour in being selected for the prestigious project.

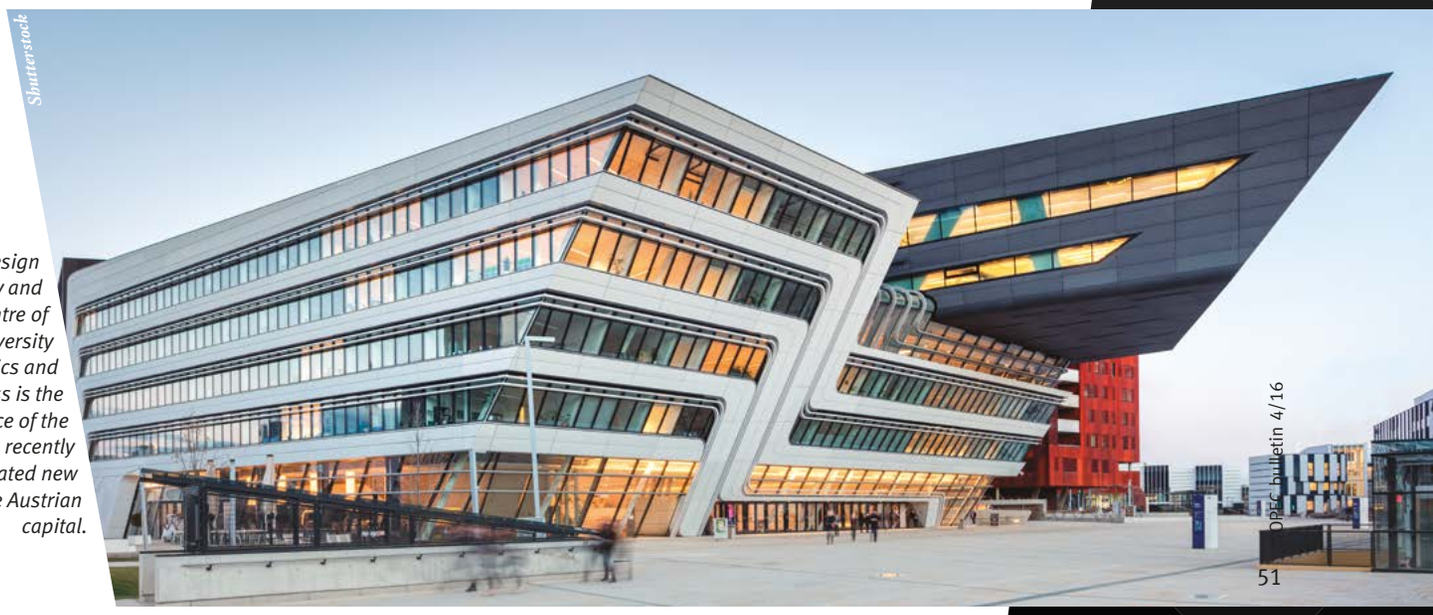
"I am deeply touched that I have been asked to design the new headquarters for the Central Bank of Iraq," she stated. "I was born in Iraq and I still feel very close to it. I feel very privileged to be working in Iraq on a design of such national importance."

A global legacy

It seems fitting that one of her last works brought her full circle back to where it all began, back to her city of birth. The building will remain a lasting legacy and inspiration to young Iraqis for years to come.

When all is said and done, though, Hadid was really the world's architect. No boundaries could box her in, geographically or architecturally. The world's many cities were her sketching board, and the sky seemed to be the only limit, or maybe not.

Thanks for the amazing ride, Dame Zaha Hadid — your intensely personal and visionary work has stretched our imaginations, opened our minds, smoothed out our rough edges and enlightened us all as to what architecture can truly achieve.



Hadid's design for the library and learning centre of the Vienna University of Economics and Business is the centerpiece of the institution's recently inaugurated new campus in the Austrian capital.

Vienna museum flying at the top of its class

The Natural History Museum Vienna is a treasure trove of objet d'art that provides a fascinating window into our past and present. With an area of some 8,700 square metres, thousands of items are on display. And behind the scenes, the museum, which first opened its doors to the public in 1889, houses collections comprising some 25 million specimens and artefacts which form the basis of the extensive research work of over 60 staff scientists. One of those fields of interest is ornithology. In fact, birds form a very important part of the museum's work. The OPEC Bulletin's Maureen MacNeill reports on this intriguing side of one of Austria's most popular establishments.

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Walking into the back rooms of the aviary section of the National History Museum (NHM) in Vienna is like experiencing time travel. The ancient building, with its endlessly tall ceilings whisper of mysteries past, as do the yellowed papers, pull-out shelves of stuffed birds and books with hand-drawn figures over 200 years old contained therein. They remind a visitor that the world was not always as it is today.

I had the rare opportunity to visit the section when a family parrot died and we donated it to the museum's collection about four years ago. We were greeted then at the non-access area by the smell of preservative chemicals and the manager of the collection, Hans-Martin Berg, who accompanied us on our visit (two adults and three children) as thanks for handing over our specimen.

The excitement of being allowed into a secret part of the museum was palpable and the three girls looked on with huge eyes. We were told the stories of various bird specimens and allowed to leaf through some enormous, ancient, one-of-a-kind books with hand-made drawings etched by long-gone bird biologists. Using white gloves, we exclaimed over the purity of line and the fact that a lot of the bird species look very similar today.

It was with awe that we visited the bird section, with sturdy, sliding drawers containing rows of preserved specimens, bright feathers still shining after many decades or even centuries. Tags on each bird retained the identity and information of each one, explaining when it arrived, where it was from and a few other details, some so old that the paper had yellowed and become fragile and largely illegible. Each drawer felt like the opening into a long-lost treasure hidden for years, each full of individual, magical stories.

The unexpected highlight of this first trip was a foray to the chilly depths of the gargantuan building to level –3, which had been added in 1986 (along with –4) when the city's U3 underground line was expanded. The cold air (11°C) stops pest insects that would eat the specimens and aids in preservation, says Berg. It is impossible to keep the main part of the collection rooms cool, he adds. "We still use mothballs."

Not knowing what to expect, we walked along dim corridors to an area with huge, lumbering wall-to-ceiling sliding cupboards. We followed the corridors past shelves with stuffed specimens, and were led to a back area which contained something very special — preserved birds of all shapes, sizes and colours, some of which have become extinct. Terribly sad on one hand to see that humankind has caused such beautiful and fragile creatures to perish, it somehow also brought to mind Jurassic Park and the possibility of using the genetic material contained in these shadows to reanimate them.

Back to 2016

Fast-forward to 2016: In order to refresh my memory about all the fascinating details of the collection, a second visit was undertaken recently; this time the 'adult' version of the tour.

The bird collection at the NHM is among the most important worldwide. It would not even be possible to create such a collection today because there are simply less birds around and regulations would not allow the kind of hunting for collecting which went on when the museum's collection was growing in the early days, according to Berg, who is still the collection manager. Since 2011, the head of the collection has been Dr Anita Gamauf, who carries out the main scientific work.

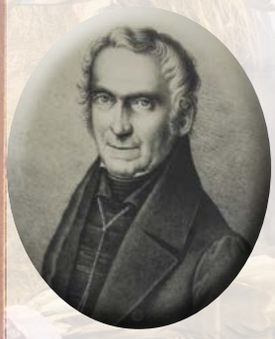
Today the collection consists of 130,000 objects, with about 10,000 of these stuffed and about 2,500 of this number on display at any given time. About 97,000 study skins, 10,000 skeletons and 10,000 eggs are saved in drawers and in the basement for research and as a genetic base. The cast of characters who have contributed the most to the collection over the years are from another time — colourful personalities, among them scientists and curators, some autodidactic, pursuing their passion as collectors, and able to implement great freedom and creativity in their efforts.

"The collectors were enthusiastic people … there were different rules at the time (for collecting samples). Collectors from the museum had permission (to kill animals)," says Berg.

Of these, over 12,000 alone came from Johann Natterer (1787–1843) a naturalist and ornithologist like his father Josef Natterer Sr. Some 205 of them were new species, 24 of which were named after him. His specimens constitute one of the most important elements of the bird collection at the NHM.

He is still admired today by collectors and staff at the museum. "His specimens are so old and still perfect. We need the collector, place, date, the most data possible. The beak and foot colours can change on stuffed skins due to storage. Natterer wrote down all the colours of the soft parts of fresh corpses. This is valuable for scientific purposes."

Natterer did not only collect profuse amounts of material for the museum, he made notes and sketches in the field as well, states Berg. "Everything was conserved …



Johann Natterer (1787–1843).

Show case with raptor specimens in the public gallery of the NHM, hall 30.

Black headed gull skin in the public gallery.

nothing was lost, not even with ships sinking and so on that went on in those days … Natterer is our holy guy. He could preserve specimens well and had good material."

Natterer's father was the last mounted falconer of Austria. When Kaiser Franz II dissolved the falconry in Laxenburg, he bought Joseph Natterer Sr's collection in 1793. This contained numerous native birds, mammals and insects, and the Kaiser supported further development of the collection. Natterer Sr had known a way to preserve birds that was very successful and his personal collection became the basis for the Kaiser's new animal collection, which was placed in the Hofburg at Josefsplatz and became open to the public in 1797. The stock was moved to the NHM's current location on the Ring in the 1880s.

The Natterer dynasty

Natterer Sr became the first supervisor for the zoological collection and also had the contract to expand the collection. The first inventory in 1806 listed 1,664 individuals of 804 bird species. Parts of the bird collection and other zoological specimens were burned in the 1848 Hofburg fire during the Vienna Revolution after an attack by the Emperor's troops against nearby rebels.

Natterer Sr's two sons — Johann and Josef — were well-versed in the study of nature and had received the best instruction in preparing and preserving animals by their father. Although they took different paths, they both became connected to the NHM and the quickly growing bird collection as volunteers and collectors under the monarchy. Josef junior (1786–1852) was curator from 1810 until 1851 and his brother Johann became a respected international explorer in Brazil's bird world. He was a member of the Leopoldina expedition which started in 1817, though he stayed until 1835, travelling with single-minded sacrificial commitment. Furthermore, he became a very important collector of ethnographic objects, confirms Berg. "He even sent his own tapeworm back from one of his expeditions — it's still part of the collection in the museum."

The bird collection continued to grow through purchases and exchanges and via birds donated as gifts from all parts of the world. Additionally, NHM staff undertook various expeditions of their own.

Among important major acquisitions in the early days of the exhibition, one stemmed from a stock auction in London in 1806, from which several extinct bird specimens were bought, for example, one of only two preserved Lord Howe gallinule skins. At the same auction there were bird specimens obtained which had been collected by James Cook in the 1770s in Hawaii on his third expedition. They were part of the famous Leverian collection, assembled by Sir Ashton Lever, which was sold for financial reasons. "Kaiser Franz made an offer through his confidant Leopold von Fichtel and received the majority. He had enough money and offered a good bargain. Some of our most important pieces are from there," says Berg.

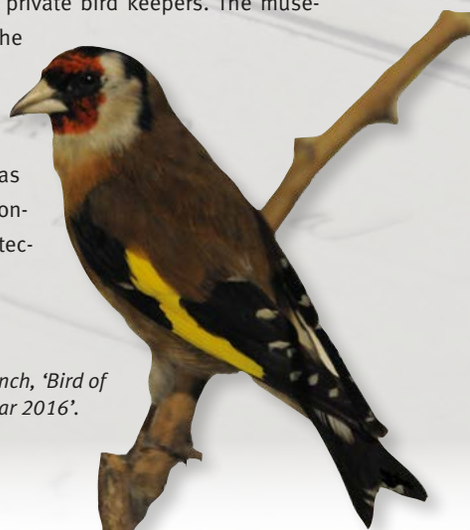
Around the same time, the acquisition of dead birds from the Schönbrunn menangerie and birds of captivity belonging to the Emperor from a terrace in Burggarten began. That is how an ostrich, brought live from South Africa in 1806 and an already rare Cuban macaw, brought in 1832, made their way into the collection. The oldest bird in the collection is probably one brought from an expedition by Nikolaus von Jacquin around 1755.

Baron Hügel brought many samples from East Asia and Australia in 1839. An Austrian naturalist from Linz, Andreas Reischek, brought many new valuable samples from New Zealand and in 1910 over 6,000 samples came from Africa explorer Rudolf Grauer. With the addition of 7,000 excellent samples from Viktor von Tschusi zu Schmidhoffen (1847–1924), the bird collection in 1906 saw its largest growth spurt since Natterer's time.

Expeditions initiated by the Emperor, such as the world sailing trip of the frigate Novara (1857–1859) as well as hunting trips of the Habsburgers themselves, some by Crown Prince Rudolf, additionally brought many samples to the collection.

The crowning jewels of the collection include the approximately 1,000 types that are reference examples for newly described species. Today there are supplements to the collection through exchange, car accidents as well as through zoos and private bird keepers. The museum's research runs in the direction of phylogenetic relatives of bird groups or ecological morphology as well as the actual responsibilities of nature protection research.

Bird skin originally labelled by Johann Natterer collected in Brazil.



Goldfinch, 'Bird of the Year 2016'.

Preserved bearded vulture circling in the public gallery, hall 29.

View from hall 32 in the public gallery.

The collection at the NHM is special because of "its age, the regions it comes from and different circumstances," says Berg. "Due to the collection's history, it focusses on Central Africa, New Zealand and South America — especially Brazil, and Europe."

He adds that the NHM collection is one of the oldest in the world and that it is very important for scientists. "Many scientists come to visit … they write to us. They are looking for different individuals of one bird species so they can compare them."

There are also many skeletons, wings, feathers, eggs, etc. in the collection, used to understand the biology of the birds. A very large egg collection was given as a gift by an ornithologist in times of the Austrian monarchy. "It is something you would never get today."

Austrian room

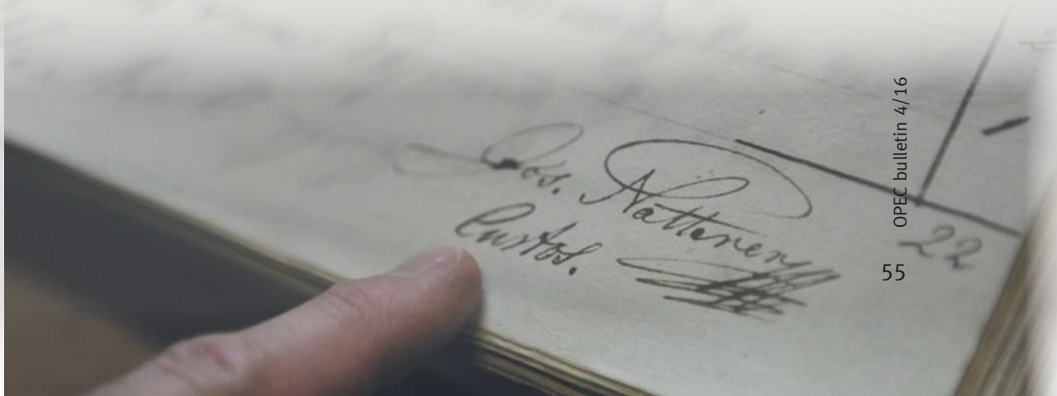
In the Austrian room, the majority of birds that can be seen in the country are represented; a virtual potpourri of oddities and individuals. Not all of them breed in Austria, some may only come to overwinter, says Berg. There are about 420 species and many pupils come to visit the section, he adds. "Biodiversity lives here! We want to show diversity — all the bird species from our country. This doesn't exist anywhere else."

Some of the birds have special characteristics, such as the bearded vulture or 'bone breaker', which feeds only on bones when all the flesh is gone from cadavers. "In the food hierarchy it is the last one in line, because it can nourish itself on bones … it lets the bones fall and swallows the pieces." The bird is also interesting because it has salmon-coloured feathers meant to impress mates. It searches for water containing iron oxide for bathing in order to keep its colour. If it is kept in captivity the colour fades away. Unfortunately, the birds became extinct in Austria. They were hunted because they were rumoured to kill and eat sheep and children. "In fact, they would not even have been capable of that … they have weak claws." Nowadays the bearded vulture has been reintroduced to the Alps.

The 'bird of the year', the goldfinch, faces protection issues. "There are not yet so few, but its habitats with sufficient food are becoming smaller and smaller," notes Berg. "It needs fallow land to find food."

The great bustard from northern Burgenland is a steppe bird that came from Central Asia to Middle Europe. It likes agrarian land, but not where there is intensive farming. When it is doing its mating dance, it turns its

Josef Natterer Jr's signature in an acquisitions book in the bird collection.



feathers right around and becomes a white ball. Although it was intensively hunted, today there are about 400 individuals again due to conservation efforts.

The last little bustard nest was recorded in Austria in 1921. This bird, due to its smaller size, has to jump in the air in its steppe habitat to get females' attention.

One of the heaviest flying birds is the mute swan, which weighs up to 15 kg and needs a "starting lane" to take off. They were originally introduced to Austria by aristocrats in the Baroque time.

Not all the stories of avian fate in Austria are negative. One success story is that of the imperial eagle, which bred in the country before it disappeared in 1820 and came back due to conservation measures in 1999. Today there are about 15 breeding pairs in the country.

"Johann Natterer shot one in the Viennese Lobau (near the Danube river) and collected it for the museum … that was normal then. Now the story comes full circle because after so many years it is back as a breeding bird," says Berg.

The beak and claws of a bird can show whether it is meant to catch big or small animals or prefers a vegetarian diet, he adds. For example, the golden eagle possesses large claws capable of killing medium-sized prey.

A lot of the wooden display boxes in the "Austrian Room" are original. They have been in use since the opening of the museum, Berg claims. "From the case to the last detail inside … a museum inside a museum."

He remembers in his early days, around 1985, when there was still no electric light in parts of the public gallery and it had to be closed in the wintertime at 3 pm because it got too dark to see the birds. Lighting was in fact only installed in the 1990s in the exhibit area. In the scientific collection, the display boxes used to all be made of wood, but now nearly all are made of steel sheet, better protecting the collection against fire and pest insects. "By modern standards we are now in good shape, though the archives could be better."

As perhaps takes place in many museums, there are arguments about whether to focus exhibitions on popular birds, or to show their biodiversity in a scientific context. The bird gallery went with the latter, for which Berg is pleased, so there are a lot of different species still on display. "People come here because they look for that."

There are still birds collected today, but the principles behind collecting have generally changed, he says. Collecting of birds must link strictly to scientific research to protect wild populations in times of great loss of biodiversity. Preservation methods have also changed. There is less plant material used (like cotton or even balled newspaper) than in the past; in some study skins now a plastic form is pre-made and the skin basically just pulled over top. All parts of the birds shown in the public gallery are original at the NHM, though the feet and feathers are sometimes touched up with paint to match their original colour, he adds.

Interesting and unique

Most of the systematic bird groups exist in the scientific collection. The systematic organization is not stable and may change with continued research. "For example, falcons and parrots are closely related contrary to former knowledge." Some bird orders are big and some are small, he says. In fact, some, like the order of shoebills, consist of only one species.

To properly manage the collection, curators follow a systematic order that nowadays includes about 11,000 described bird species. About two-thirds of these are part of the NHM collection. However, new species are still being discovered.

The individuality in the bird world is more wide and varied than most people can imagine, from the various shapes and sizes to the differing feet, bills and feathers. Some have remarkable adaptations.

For example, German police used trained vultures in a field study to find bodies not long ago, because the birds are capable of finding cadavers for kilometres, states Berg.

The Egyptian vulture feeds on the eggs of other birds, using tools, like pebbles, to open the eggs because its beak is too weak; the use of tools is rare in birds. The

The beautiful plumage of the great bustard.

penduline tit builds complex nests made of tufts of white hairs of poplar seeds by wrapping it around twigs.

In the past, some bird populations, especially white herons, were plundered for feathers that were used as fashion items, states Berg. Some specimens of birds of paradise and hummingbirds were put on the hats of rich people, he says.

It was the dire situation caused by fashion aficionados that actually led to the beginning of bird protection, adds Berg. It all began with the collapse of egret populations in around 1900 and a German lady called Lina Hähnle, who got tired of birds being killed for fashion, and initiated a global movement.

Others had difficulties surviving because they could not adapt to a changing world. The dodo was easy to catch and was eaten by seafarers. The New Zealand kakapo, a parrot, nearly died out because it can't fly and was captured by rats, cats and other predators introduced by humans. In a last-ditch attempt to save the birds, some were taken to an island with no predators and today 150 are still alive.

One shocking and famous story is that of Martha, the last passenger pigeon, who died in the Cincinnati Zoo on September 1, 1914. There used to be millions of passenger pigeons and they were hunted for food and sport right down to the last one. "We know the minute she died. There were huge colonies but the less they became the less safe they were. There are films and books about it because the story is so unbelievable … how it can change."

Although such traps as huge nets in Egypt are bringing bird numbers down drastically, the worst problem facing them today is loss of habitat due to intensive single-crop farming.

"The worst of it is happening in front of our door in our fast-changing, cultivated landscape," states Berg.

Berg and his colleagues are doing everything they can to raise awareness of birds, their beauty and their plight, and to preserve them. It is a job he takes seriously. Since 1996 the collection staff has been creating a digital inventory of the collection. "The next generation can use it for science … it is the heritage of over 200 years and we have to preserve it. Who knows what science can do in 50 years with all the specimens in our collection?"

Hans-Martin Berg (l), Manager of the collection, with Maureen MacNeill.

Cuban macaw from the aviary of Emperor Franz II in the NHM collection.

Colour plate with rosy starlings in the 'Naturgeschichte der Vögel Deutschlands' from the beginning of the 19th century.

OFID supports launch of petroleum industry Energy Access Platform

OFID

Executives from major oil and gas companies and strategic partners have joined together with The OPEC Fund for International Development (OFID) and the World Petroleum Council (WPC) to launch a special framework that will see the industry collaborate with other stakeholders to support universal access to sustainable energy by 2030.

Faris Hasan, OFID Director of Corporate Planning and Economic Services, and Namat Abu Al-Soof, Consultant, who attended the initiative's launch at OFID headquarters in Vienna, compiled this report.

The oil and gas industry Energy Access Platform (EAP) was launched by OFID and the WPC at OFID headquarters in Vienna on March 21. Aligned with the United Nations multi-stakeholder Sustainable Energy for All (SE4All) initiative, the EAP will directly support achievement of the Sustainable Development Goals (SDGs), in particular SDG7 on universal energy access.

Lead partners OFID and the WPC were joined by representatives from Total, Shell International, the Global LPG Partnership, the International Gas Union and the Shell Foundation, among several others.

The EAP will provide an opportunity for oil and gas companies to collaborate with other stakeholders on specific actions focused on energy access. Other industry players are expected to join the initiative in due course.

OFID first expressed its willingness to devise such a platform at the World Petroleum Congress in Doha in 2011. Since then, the Fund has worked to mobilize the support of the petroleum industry in addressing the needs of the billions of people in developing countries who lack access to modern energy services.

The March 21 meeting marked the success of this effort, which OFID Director-General, Suleiman J Al-Herbish, described as "a defining moment for both OFID and for the members of the oil and gas industry who join us, as we propel the effort to ensure access to affordable, reliable, sustainable, modern energy for all, regardless of the situation in the oil market."

He expressed his conviction that the EAP would harness the petroleum industry's vast pool of resources, expertise, know-how, technologies and access to capital.

"The industry is in a unique position to take a leading role in facilitating energy access," he stated, pointing to the collaborative nature of the platform which "puts this goal on the fast track and complements existing industry efforts, such as the Oil and Gas Climate Initiative."

Al-Herbish pointed out that the EAP offered a two-fold benefit, giving members the chance to both help the poor and steer the industry in a positive direction.

"The results of these efforts will demonstrate to the world what can be achieved when perseverance and cooperation are joined," he maintained, adding that the EAP would serve as "a catalyst for meaningful action for other oil and gas companies, development financial institutions and the private sector to follow."

Dr József Toth, President of the WPC, echoed Al-Herbish's sentiments, confirming that the initiative would provide a framework for the oil and gas sector "to help facilitate access to safe, affordable and reliable energy wherever it is needed."

L–r: Faris Hasan, OFID's Director, Corporate Planning and Economic Services; Dr Kandeh Yumkella, former UN Under-Secretary General and Special Representative, SE4ALL; Suleiman J Al-Herbish, OFID Director-General; Dr Jozsef Toth, President, WPC; and Erik Kjaer, Chief of Country Action, SE4All.

In highlighting what the oil and gas industry could bring to the platform, he said: "By sharing best practical knowledge, projects and solutions with each other, we can leverage the expertise and capabilities of our industry as key part of the energy sector to enhance the lives of the billions of people without access to modern energy options."

In a keynote address to the event, Dr Kandeh Yumkella, former UN Under-Secretary General and Special Representative, SE4ALL, stressed that a platform like the oil and gas industry EAP could help in proper planning, building ecosystems and skills development.

He called on industry actors to join the platform by illustrating the benefits to be gained by the industry.

"When you enhance their productivity by making sure poor families have three hours of power at night, by making sure they can pump water because they are using solar power, guess what — their incomes go up," stressed Yumkella.

"You can always sell oil and gas, but if we give these communities existing, simple, cheap technologies to raise their income levels it is a win-win situation."

Stakeholders pledge support

The meeting listened to several presentations and statements from the endorsing partners, including some inspiring stories about successful initiatives on energy access undertaken by individual companies and their associations.

The speakers demonstrated their support to the EAP. They also emphasized the industry's desire and commitment to make a difference to people's lives.

Expressing his support for the platform, Erik Kjaer, Chief of Country Action, SE4All, acknowledged that "access to energy is one of the biggest challenges facing SE4All and initiatives like the EAP are in very high demand and it is welcomed."

Jean-Marc Fontaine, Total's Vice-President of Social Business and Societal, highlighted his company's willingness to join the platform, noting that energy access was one of company's five main targets to combat climate change.

"The target is to provide access to 25 million people by 2025; this can only be achieved by working with others," he professed.

Fontaine went on to share Total's four-part vision for the platform: "Operational to make sure we remain grounded in our core business; strategic to measure our impact and be transparent about what we are going to achieve; partnership to work with as many companies as possible; and, we must always remain rooted in innovation."

Joanna Cochrane, Shell International's Vice-President of Social Performance, expressed Shell's privilege at being invited to join the platform.

While noting that energy access could make the difference between poverty and prosperity, she cautioned that meeting the demand challenge, the stress of the environment and transforming the supply of the future was "in and of itself an unprecedented energy challenge … producing the stuff does not guarantee universal access to energy."

In the quest to make energy more inclusive for everybody, Cochrane pointed out that business as usual was not enough.

"We need to leverage core business skills, support innovation by helping third parties develop possible solutions and collaborate through platforms like the EAP," she stated.

Offering his full endorsement of the platform, Sam Parker, Director, Shell Foundation, welcomed all efforts from all sectors to achieve the 2030 goal on energy access.

Noting that there was adequate technology, interest, finance and goodwill to achieve the objectives of SDG7,

he emphasized, however, that "we need to behave differently, to collaborate in a new way, and this platform is one example where we can have different collaboration on energy access."

Parker's remarks were reinforced by Kimball C Chen, Chairman, Global LPG Partnership, who said: "Sometimes it is necessary to have well constituted platforms to achieve results and the EAP is the right vehicle to provide cooperation on energy access, which we endorse."

In closing remarks, Al-Herbish expressed his appreciation to all participants for their outstanding effort and reiterated OFID's commitment to work with the petroleum industry and actively support energy access.

OFID will serve as the EAP Secretariat. The first meeting of the platform's executive committee was held the same day as the launch ceremony.

The committee will be in charge of establishing the vision and direction of the EAP; outlining an implementation plan; enlisting partners; convening initiatives and encouraging new ones; and, could annually report progress to the SE4ALL global facilitating team.

WPC

Members of the EAP Executive Committee seen at their first meeting.

Forthcoming events

9th global crude oil summit, May 10–11, 2016, London, UK. Details: Platts, 20 Canada Square, Canary Wharf, London E14 5LH, UK. Tel: +44 207 17 66 142; fax: +44 207 17 68 512; e-mail: cynthia_rugg@platts.com; website: www.platts.com/events/global/Global-Crude-Oil-Summit/index.

Canada LNG export conference and exhibition, May 10–12, 2016, Vancouver, Canada. Details: dmg :: events, 25th Floor, Milbank, London, SW1P 4QP, UK. Tel: +44 20 37 72 60 80; e-mail: neillhoward@dmgevents.com; website: www.canadalngexport.com.

5th North American refined products, May 17–18, 2016, Houston, TX, USA. Details: Platts, 20 Canada Square, Canary Wharf, London E14 5LH, UK. Tel: +44 207 17 66 142; fax: +44 207 17 68 512; e-mail: cynthia_rugg@platts.com; website: www.platts.com/events/americas/north-american-refined-products/index.

3rd annual Myanmar upstream oil and gas summit and exhibition, May 17–19, 2016, Naypyidaw, Myanmar. Details: CWC Associates Ltd, Regent House, Oyster Wharf, 16–18 Lombard Road, London SW11 3RF, UK. Tel: +44 207 97 80 00; fax: +44 207 97 80 099; e-mail: sshelton@thecwcgroup.com; website: www.cwcmyanmar.com.

Shale world UK, May 18–19, 2016, London, UK. Details: Terrapinn Holdings Ltd, First Floor, Modular Place, Turnberry Office Park, 48 Grosvenor Road, Bryanston 2021, South Africa. Tel: +27 11 51 64 000; fax: +27 11 46 36 000; e-mail: enquiry.za@terrapinn.com; website: www.terrapinn.com/conference/shale-gas-uk/?pk_campaign=Terr-Listing&pk_kwd=Energy+%26+Resources.

OGU Uzbekistan, May 18–20, 2016, Tashkent, Uzbekistan. Details: ITE Group plc, Oil and Gas Division, 105 Salusbury Road, London NW6 6RG, UK. Tel: +44 207 59 65 233; fax: +44 207 59 65 106; e-mail: oilgas@ite-exhibitions.com; website: www.ite-exhibitions.com/Event-Managment/ITE-UZBEKISTAN/OGU-Uzbekistan.aspx.

14th international exhibition for the energy industry, May 19–21, 2016, Lahore, Pakistan. Pegasus Consultancy (Pvt) Ltd, 2nd Floor, Business Centre, Mumtaz Hassan Road, Karachi 74000, Pakistan. Tel: +9221 11 17 34 266; fax: +9221 32 41 07 23; e-mail: info@pogee.com.pk; website: www.pogeepakistan.com/oil_gas_exhibition/oil_gas_exhibition_index.html.

Turkmenistan gas congress, May 19–21, 2016, Avaza, Turkmenistan. Details: ITE Group plc, Oil and Gas Division, 105 Salusbury Road, London NW6 6RG, UK. Tel: +44 207 59 65 233; fax: +44 207 59 65 106; e-mail: oilgas@ite-exhibitions.com; website: www.ite-exhibitions.com/Event-Managment/SUMMIT/Turkmenistan-Gas-Congress-(TGC).aspx.

7th European bunker fuel conference, May 24–25, 2016, Rotterdam, The Netherlands. Details: Platts, 20 Canada Square, Canary Wharf, London E14 5LH, UK. Tel: +44 207 17 66 142; fax: +44 207 17 68 512; e-mail: cynthia_rugg@platts.com; website: www.platts.com/events/emea/european-bunker-fuel/index.

Oil and gas mobility summit US, May 24–26, 2016, Houston, TX, USA. Details: IQPC Ltd, Anchor House, 15–19 Britten Street, London SW3 3QL, UK. Tel: +44 207 36 89 300; fax: +44 207 36 89 301; e-mail: enquire@iqpc.co.uk; website: www.oilandgasmobility.com.

Operational excellence in oil and gas Asia 2016, May 24–26, 2016, Singapore Details: IQPC Ltd, Anchor House, 15–19 Britten Street, London SW3 3QL, UK. Tel: +44 207 36 89 300; fax: +44 207 36 89 301; e-mail: enquire@iqpc.co.uk; website: www.opexoilandgasasia.com.

The 14th Africa independents forum 2016, May 24–26, 2016, London, UK. Details: Global Pacific Partners, Suite 7, 4 Montpelier Street, Knightsbridge, London SW7 1EE, UK. Tel: +44 207 58 97 804; fax: +44 207 58 97 814; e-mail: babette@glopac.com; website: http://aif.globalpacificpartners.com/events/?fa=overview&id=963.

4th annual crisis and risk management summit, May 29–June 1, 2016, Kuwait City, Kuwait. Details: IQPC Ltd, Anchor House, 15–19 Britten Street, London SW3 3QL, UK. Tel: +44 207 36 89 300; fax: +44 207 36 89 301; e-mail: enquire@iqpc.co.uk; website: www.crisisandriskmanagementsummit.com.

Operational excellence in oil and gas, May 31–June 2, 2016, Calgary, AB, Canada. Details: IQPC Ltd, Anchor House, 15–19 Britten Street, London SW3 3QL, UK. Tel: +44 207 36 89 300; fax: +44 207 36 89 301; e-mail: enquire@iqpc.co.uk; website: www.opexinoilandgas.ca.

Mediterranean oil and gas 2016 summit, May 31–June 3, 2016, Rome, Italy. Details: International Research Networks Ltd, 10–18 Vestry Street, 1st Floor, N1 7RE London, UK. Tel: +44 207 11 11 615; fax: +44 207 18 37 945; e-mail: cristinaR@irn-international.com; website: www.medoilgassummit.com.

Project Lebanon 2016, May 31–June 3, 2016, Beirut, Lebanon. Details: IFP Group Building, 801 Street, Hazmieh, PO Box 55576, Beirut, Lebanon. Tel: +961 5 95 91 11; fax: +961 5 95 98 88; e-mail: projectlebanon@ifpexpo.com; website: www.projectlebanon.com/home.php#.VsrlTk32bDB.

Caspian oil and gas Azerbaijan, June 1–4, 2016, Baku, Azerbaijan. Details: ITE Group plc, Oil and Gas Division, 105 Salusbury Road, London NW6 6RG, UK. Tel: +44 207 59 65 233; fax: +44 207 59 65 106; e-mail: oilgas@ite-exhibitions.com; website: www.caspianoilgas.az/2016.

Oil and gas Philippines 2016, June 6–8, 2016, Manila, Philippines. Details: Fireworks Trade Media Pte Ltd, 73 Upper Paya Lebar Rd, Centro Bianco #08-01, 534818 Singapore. Tel: +65 62 80 58 71; e-mail: sg@asia-fireworks.com; website: http://oilgasphil.com/post/15/Conference.html.

Canada heavy oil technical conference, June 7–8, 2016, Calgary, Canada. Details: Society of Petroleum Engineers, PO Box 833836, Richardson, TX 75083-3836, USA. Tel: +1 972 95 23 93; fax: +1 972 95 29 435; e-mail: spedal@spe.org; website: www.spe.org/events/choc/2016.

5th oil and gas Kenya 2016, June 10–12, 2016, Nairobi, Kenya. Details: Expo Group; Urafiki Flat J5, Apartment 16, 2nd Floor, Opp Millenium Business Park, Morogoro Road, Ubungo, Dar es Salaam, Tanzania. Tel: +255 75 27 59 304; e-mail: expo@expogr.com; website: www.expogr.com/kenyaoil.

Adapting to a challenging oil price environment, June 14, 2016, London, UK. Details: Society of Petroleum Engineers, Part Third Floor East, Portland House, 4 Great Portland Street, London W1W 8QJ, UK. Tel: +44 207 29 93 300; fax: +44 207 29 93 309; e-mail: spelon@spe.org; website: www.spe.org/events/lond/2016.

Summer driving season again set to boost product markets

***April* 2016**

Global oil product markets are once again expected to receive support from gasoline demand ahead of the summer driving season in the northern hemisphere.

That was the view put forward by the OPEC Secretariat's *Monthly Oil Market Report (MOMR)* for April.

However, it noted that unlike in the previous year, OECD gasoil demand may not have sufficient strength to offset the continued slowdown in non-OECD consumption.

"Over the last two quarters, middle distillate consumption in the OECD Americas alone has seen a decline of more than 400,000 b/d compared to the same period a year earlier, while growth in the Asia Pacific has remained broadly flat and consumption in Europe has fallen from the peak seen at the start of last year," the publication's feature article commented.

It maintained that oil product inventories were another factor that would impact refinery margins in the months ahead.

"Healthy gasoline cracks have encouraged refiners to continue to push runs to historic highs in China, India and the United States, resulting in record storage builds," it stated.

The *MOMR* observed that the end of spring maintenance would allow refiners to once again increase runs in preparation for the impending summer driving season.

"However, higher product inventories are expected to exert pressure on margins, potentially forcing a decrease in throughputs this summer if gasoil consumption is not able to show a recovery supported by a pickup in global economic growth."

In giving a brief overview of the summer product market outlook, the report pointed out that the oil market was generally driven in the summer months by product market developments, particularly demand for gasoline and, to a lesser extent, diesel.

"As refiners across the northern hemisphere have already begun preparations for the summer season, a review of recent product market developments and a look forward to expectations for the summer can provide a timely assessment of potential market direction over this key demand period," it explained.

It stressed that worldwide gasoline demand had soared in recent years, driven by strong demand growth, not only in the non-OECD region, but also in the OECD countries.

"Consumption has been boosted by robust car sales in the US, as well as Europe, along with a shift in favour of larger vehicles, including SUVs."

At the same time, said the *MOMR*, demand growth for gasoil in the non-OECD region had decelerated, allowing gasoline to surpass gasoil as the main contributor to global product demand growth in 2015.

Last year, it continued, product markets in the Atlantic Basin benefited from gasoline's strong performance during the US driving season. US demand for gasoline hit 9.4 million barrels/day during this time, a level not seen since 2007.

"This allowed gasoline crack spreads to soar to two-year highs. At the same time, gasoil demand also experienced strong growth, keeping refinery margins healthy at around $14/b in the US over the first half of the year."

However, said the report, by the end of the third quarter of last year, product markets in the Atlantic Basin lost momentum, as gasoil demand turned flat.

Amid a weakening seen across the barrel, refinery margins plunged, with US margins shedding more than $7/b in September.

Product markets in the Atlantic Basin struggled to recover in the latter part of the year, as the mild winter season in the northern hemisphere failed to provide its typical support.

"In Asia, refinery margins last year were supported by strong gasoline and petrochemical naphtha demand. However, gasoil demand remained weak due to the ongoing decelerating trend in demand growth," commented the report.

Additionally, pressure from the supply side due to increasing product exports within the region from South Korea, India and China impacted margins and caused gasoil inventories at the Singapore hub to stand at high levels during most of last year, it added.

MOMR ... oil market highlights

April 2016

The **OPEC Reference Basket** increased by more than 20 per cent to reach $34.65/b in March. ICE Brent ended up $6.26 at $39.79/b and Nymex WTI surged by $7.34 to $37.96/b. Speculators have amassed a near-record number of bullish bets on increasing oil prices. The Brent-WTI spread narrowed considerably in March to stand at $1.83/b, prompting renewed US buying interest in West African light sweet grades.

World economic growth is forecast at 3.1 per cent in 2016, after estimated growth of 2.9 per cent last year, both unchanged from the previous month. OECD growth in 2016 remains at 1.9 per cent, slightly below the 2.0 per cent seen in 2015. In the emerging economies, China and India continue to expand this year at 6.3 per cent and 7.5 per cent, respectively, unchanged from the previous report. Meanwhile, Brazil is forecast to move further into recession this year, contracting by 2.9 per cent, while the contraction in Russia's economy is unchanged at 1.1 per cent.

World oil demand is expected to have grown by 1.54 million barrels/day in 2015, unchanged from the previous report, to average 92.98m b/d. For 2016, global oil demand growth is anticipated to be around 1.20m b/d, representing a minor downward revision of around 50,000 b/d from previous expectations, mainly reflecting the slower economic momentum in Latin America. Total consumption is projected to reach 94.18m b/d in 2016. Non-OPEC supply growth in 2015 has been revised up slightly to stand at 1.46m b/d to average 57.13m b/d. In 2016, the expected contraction in non-OPEC oil supply will be slightly more than forecast, with output falling by 730,000 b/d to average 56.39m b/d. OPEC NGL production is expected to grow by 170,000 b/d in 2016, up from 150,000 b/d last year, unchanged from the previous report. In March, OPEC crude production increased by around 15,000 b/d to average 32.25m b/d, according to secondary sources.

Product markets in the United States were supported by strong domestic gasoline demand fueled by the switch to summer grade gasoline, which allowed refinery margins to remain healthy. In Europe, the lack of export opportunities in gasoline and fuel oil amid weakness in middle distillates caused margins to continue to fall. Meanwhile, refinery margins in Asia exhibited a slight recovery on the back of stronger regional demand and tightening sentiment due to refinery maintenance in the region.

Average dirty tanker freight rates in March rose by five per cent compared to the previous month, mainly as VLCC freight rates increased in March supported by loading delays and ullage problems in the eastern ports. Clean tanker freight rates improved East of Suez but encountered a decline West of Suez impacted by limited tonnage demand. Global chartering activities were higher in March, while arrivals increased in European and far eastern ports.

OECD commercial oil stocks fell in February to stand at 3,026 million barrels. At this level, OECD commercial oil stocks are around 351.8m b above the latest five-year average, with crude and products indicating a surplus of 240.7m b and 111.1m b, respectively. In terms of days of forward cover, OECD commercial stocks stood at 66.4 days, some 7.4 days higher than the latest five-year average

Demand for **OPEC crude** in 2015 is estimated at 29.7m b/d, unchanged from the previous month and 100,000 b/d lower than the year before. In 2016, demand for OPEC crude is projected at 31.5m b/d, broadly unchanged from the previous report and 1.8m b/d higher than the previous year.

The feature article and oil market highlights are taken from OPEC's Monthly Oil Market Report (MOMR) for April 2016. Published by the Secretariat's Petroleum Studies Department, the publication may be downloaded in PDF format from our Website (www.opec.org), provided OPEC is credited as the source for any usage. The additional graphs and tables on the following pages reflect the latest data on OPEC Reference Basket and crude and oil product prices in general.

Table 1: OPEC Reference Basket spot crude prices $/b

Crude/Member Country	2015 Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2016 Jan	Feb	Mar	Weeks 9–13/2016 (week ending) Feb 26	Mar 4	Mar 11	Mar 18	Mar 25
Arab Light – Saudi Arabia	52.20	57.73	62.62	60.94	54.95	46.52	45.56	45.37	40.64	33.70	26.35	28.77	34.74	29.35	31.43	35.06	35.30	35.99
Basrah Light – Iraq	50.53	55.61	60.40	58.63	53.10	44.32	43.41	43.50	38.70	32.06	24.73	27.08	33.39	27.80	30.21	33.75	33.91	34.58
Bonny Light – Nigeria	56.75	60.65	65.31	62.19	56.77	47.07	48.01	49.16	44.81	38.16	30.40	32.24	38.53	33.44	36.13	39.15	38.88	39.41
Es Sider – Libya	54.78	58.40	63.22	60.79	55.54	45.82	46.71	47.56	43.30	37.16	29.75	31.46	37.51	32.66	35.16	38.13	37.86	38.39
Girassol – Angola	56.86	61.12	65.51	63.28	56.46	47.42	48.01	48.45	44.74	37.88	29.95	32.28	38.42	33.64	36.22	39.11	38.76	39.25
Iran Heavy – IR Iran	51.27	56.26	61.38	59.86	54.86	46.25	44.62	44.55	38.92	31.73	24.07	27.28	33.23	27.64	29.67	33.52	33.70	34.71
Kuwait Export – Kuwait	50.52	55.96	60.92	59.29	53.85	45.28	43.96	43.61	38.39	31.49	23.92	26.77	32.99	27.27	29.51	33.27	33.53	34.33
Marine – Qatar	54.27	58.51	63.26	61.79	55.36	46.98	45.88	45.89	41.66	34.36	26.95	29.41	35.49	30.08	31.71	36.16	35.99	36.91
Merey – Venezuela	45.79	49.49	55.09	51.74	44.43	35.26	34.13	35.48	31.87	24.42	20.80	21.38	25.83	20.81	22.76	26.16	26.17	26.96
Minas – Indonesia*	54.11	58.55	62.98	60.09	51.86	42.46	42.05	42.13	40.79	33.53	30.80	29.49	34.62	29.70	31.81	35.40	35.13	35.38
Murban – UAE	57.41	61.66	66.18	64.59	57.58	48.83	48.88	49.48	45.99	39.19	31.57	34.15	40.01	34.79	36.68	40.56	40.69	41.22
Oriente – Ecuador	45.79	52.73	58.04	56.71	47.78	39.75	41.03	39.91	36.40	32.18	24.03	24.70	31.45	26.23	28.88	31.98	32.45	31.67
Saharan Blend – Algeria	56.93	59.75	64.12	61.69	56.34	47.17	48.36	49.51	45.30	38.59	31.28	33.26	39.41	34.46	37.04	40.03	39.76	40.29
OPEC Reference Basket	**52.46**	**57.30**	**62.16**	**60.21**	**54.19**	**45.46**	**44.83**	**45.02**	**40.50**	**33.64**	**26.50**	**28.72**	**34.65**	**29.33**	**31.52**	**35.08**	**35.18**	**35.81**

Table 2: Selected spot crude prices $/b

Crude/Member Country	2015 Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2016 Jan	Feb	Mar	Weeks 9–13/2016 (week ending) Feb 26	Mar 4	Mar 11	Mar 18	Mar 25
Arab Heavy – Saudi Arabia	49.34	54.26	59.42	58.01	53.55	44.82	43.37	43.01	37.00	30.15	22.50	26.15	32.76	26.47	28.99	33.01	33.24	34.30
Brega – Libya	55.68	59.20	63.97	61.24	56.04	46.32	47.25	48.21	44.02	37.91	30.60	32.31	38.36	33.51	36.01	38.98	38.71	39.24
Brent – North Sea	55.93	59.50	64.32	61.69	56.54	46.72	47.61	48.56	44.30	38.16	30.75	32.46	38.51	33.66	36.16	39.13	38.86	39.39
Dubai – UAE	54.66	58.55	63.54	61.76	56.15	47.87	45.38	45.84	41.79	34.59	26.81	29.44	35.15	29.61	31.57	35.35	35.78	36.73
Ekofisk – North Sea	57.18	60.51	64.86	62.21	57.02	47.53	48.24	49.23	45.10	38.80	31.45	32.86	38.86	34.17	36.79	39.56	39.02	39.86
Iran Light – IR Iran	54.79	59.34	63.97	62.28	55.76	45.74	46.16	47.05	43.17	35.98	28.34	30.16	36.08	31.48	33.59	36.88	36.41	37.22
Isthmus – Mexico	51.41	59.10	63.78	63.48	55.62	46.56	47.71	46.90	43.29	37.68	30.03	28.68	35.45	29.92	32.82	35.87	36.09	36.10
Oman – Oman	55.12	58.66	63.60	61.77	56.23	47.87	45.65	46.07	42.10	34.61	27.48	30.37	36.46	30.82	32.79	36.76	36.79	37.96
Suez Mix – Egypt	52.05	57.07	61.32	59.36	53.00	43.30	44.53	44.65	40.07	34.07	27.45	29.17	35.15	30.49	32.60	35.92	35.51	36.32
Urals – Russia	55.07	59.70	64.33	62.52	55.84	46.22	47.19	47.49	43.05	36.97	29.15	30.87	36.87	32.19	34.30	37.62	37.21	37.82
WTI – North America	47.77	54.43	59.28	59.81	51.17	42.77	45.48	46.26	42.67	37.23	31.46	30.33	37.77	31.32	34.66	37.81	38.32	38.84

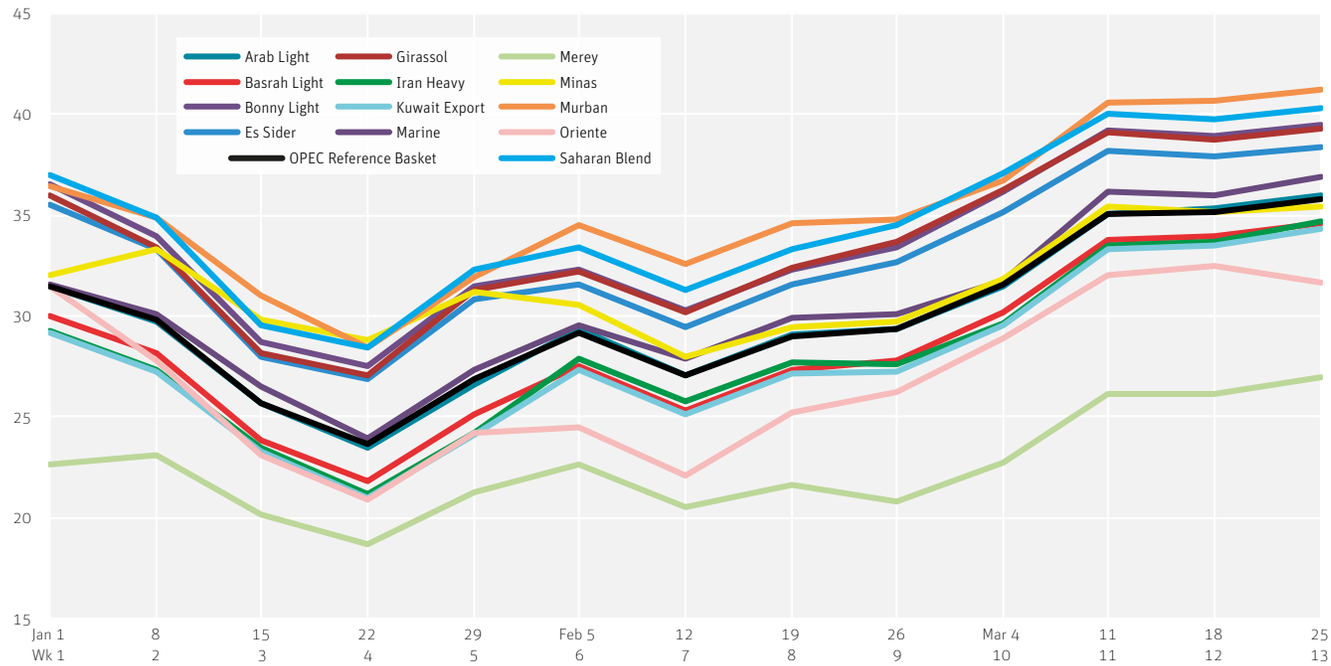
Note: As per the decision of the 109th ECB (held in February 2008), the OPEC Reference Basket (ORB) has been recalculated including the Ecuadorian crude Oriente retroactive as of October 19, 2007. As per the decision of the 108th ECB, the ORB has been recalculated including the Angolan crude Girassol, retroactive January 2007. As of January 2006, monthly averages are based on daily quotations (as approved by the 105th Meeting of the Economic Commission Board). As of June 16, 2005 (ie 3W June), the ORB has been calculated according to the new methodology as agreed by the 136th (Extraordinary) Meeting of the Conference. As of January 2009, the ORB excludes Minas (Indonesia).

** Indonesia suspended its OPEC Membership on December 31, 2008, but this was reactivated from January 1, 2016.*

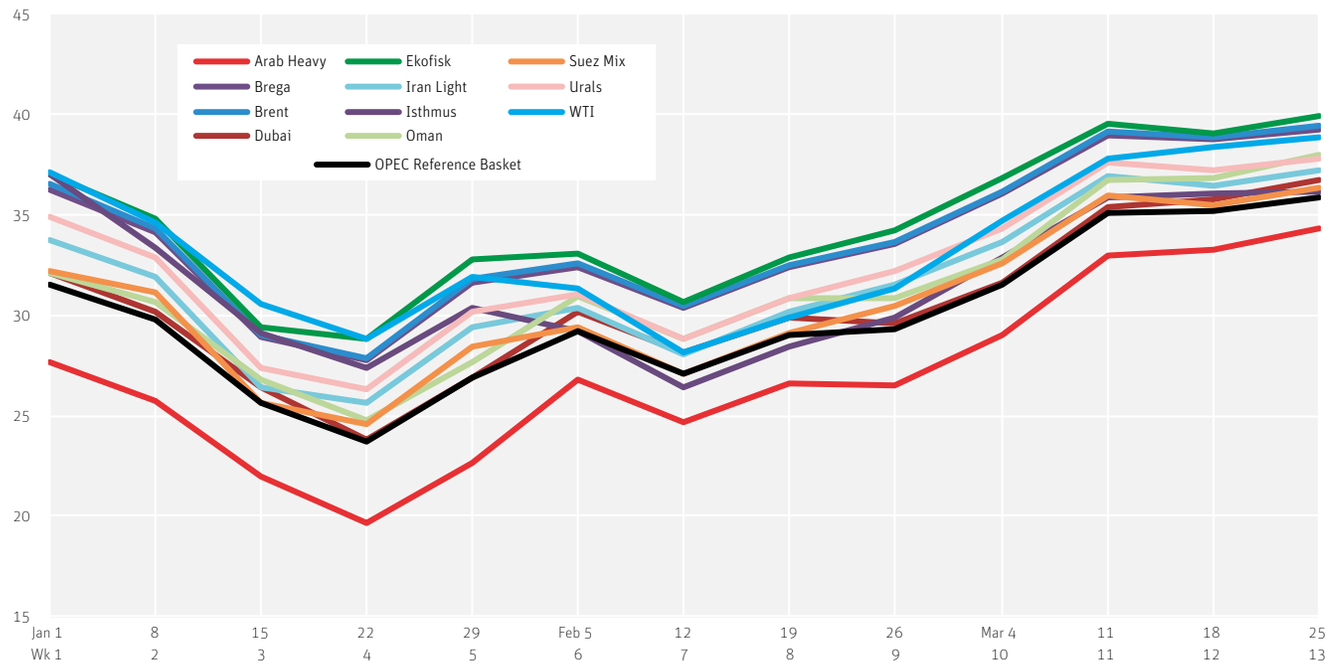
Brent for dated cargoes; Urals cif Mediterranean. All others fob loading port.

Sources: The netback values for TJL price calculations are taken from RVM; Platt's; as of January 1, 2016, Argus; Secretariat's assessments.

Graph 1: Evolution of the OPEC Reference Basket spot crude prices, 2016 $/b



Graph 2: Evolution of selected spot crude prices, 2016 $/b



Note: As per the decision of the 109th ECB (held in February 2008), the OPEC Reference Basket (ORB) has been recalculated including the Ecuadorian crude Oriente retroactive as of October 19, 2007. As per the decision of the 108th ECB, the basket has been recalculated including the Angolan crude Girassol, retroactive January 2007. As of January 2006, monthly averages are based on daily quotations (as approved by the 105th Meeting of the Economic Commission Board). As of June 16, 2005 (ie 3W June), the ORB has been calculated according to the new methodology as agreed by the 136th (Extraordinary) Meeting of the Conference. As of January 2009, the ORB excludes Minas (Indonesia).
Indonesia suspended its OPEC Membership on December 31, 2008, but this was reactivated from January 1, 2016.

Table and Graph 3: North European market — spot barges, fob Rotterdam

$/b

		naphtha	regular gasoline unleaded	diesel ultra light	jet kero	fuel oil 1 per cent S	fuel oil 3.5 per cent S
2015	March	55.65	77.62	71.77	71.93	45.35	46.07
	April	57.96	82.31	74.21	73.97	49.20	49.64
	May	60.76	87.70	79.16	78.67	52.57	53.41
	June	59.34	93.68	76.37	76.99	50.32	51.12
	July	52.04	90.50	68.59	68.18	44.59	45.30
	August	44.38	77.52	60.66	60.18	35.24	35.80
	September	45.30	70.72	61.41	61.35	33.88	34.41
	October	47.36	66.73	59.23	59.68	33.89	34.43
	November	46.13	65.27	57.06	56.78	30.20	30.68
	December	42.67	58.79	45.68	47.54	22.40	22.59
2016	January	35.13	53.41	38.11	39.21	19.85	15.08
	February	32.32	49.48	40.41	41.48	21.45	17.91
	March	38.53	54.82	47.13	47.43	24.83	21.32

Note: Prices of premium gasoline and diesel from January 1, 2008, are with 10 ppm sulphur content.

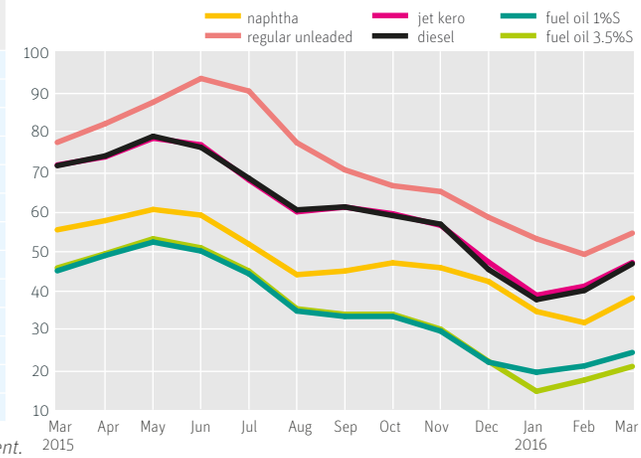


Table and Graph 4: South European market — spot cargoes, fob Italy

$/b

		naphtha	premium gasoline 50ppm	diesel ultra light	fuel oil 1 per cent S	fuel oil 3.5 per cent S
2015	March	52.55	73.37	73.42	47.87	46.03
	April	54.42	78.27	75.84	51.02	49.58
	May	58.37	82.87	80.99	54.19	52.79
	June	56.05	86.19	78.19	51.87	51.46
	July	48.48	83.94	70.34	45.57	44.77
	August	42.33	70.26	62.21	36.31	35.76
	September	43.00	63.02	63.34	34.49	34.26
	October	45.25	58.98	61.26	36.20	34.97
	November	44.06	58.77	57.28	32.83	30.02
	December	40.29	51.81	46.40	25.88	22.20
2016	January	33.42	47.01	39.48	21.22	18.35
	February	30.99	42.98	41.88	22.53	21.14
	March	37.76	47.68	48.28	24.63	23.44

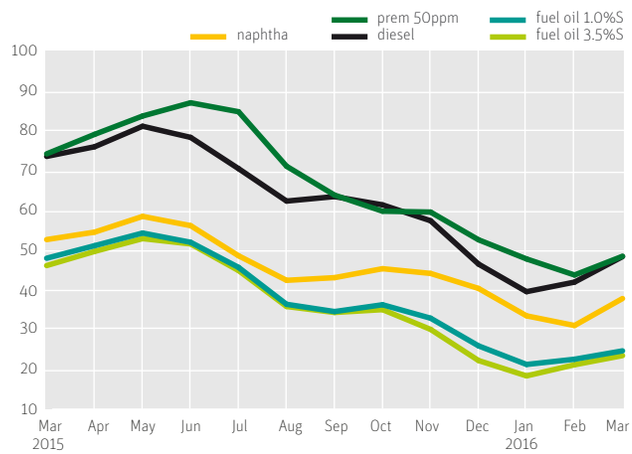


Table and Graph 5: US East Coast market — spot cargoes, New York

$/b, duties and fees included

		regular gasoline unleaded 87	gasoil*	jet kero*	fuel oil 0.3 per cent S	fuel oil 3.0 per cent S
2015	March	69.59	68.35	72.79	60.93	46.45
	April	75.99	72.65	74.67	61.66	49.04
	May	82.00	76.98	80.00	61.89	53.03
	June	84.60	74.07	75.76	59.69	51.51
	July	78.66	64.91	67.53	52.31	44.07
	August	68.26	58.40	60.76	44.45	36.44
	September	61.40	59.78	61.60	43.40	35.77
	October	58.62	58.73	60.94	46.36	35.64
	November	58.51	55.08	59.07	45.01	33.12
	December	53.68	43.89	49.31	35.65	24.09
2016	January	46.88	39.14	40.13	32.01	20.16
	February	42.59	39.48	43.03	32.46	20.20
	March	50.34	43.56	47.68	35.61	24.27

* *FOB barge spot prices.*

Source: Platts. As of January 1, 2016, Argus. Prices are average of available days.

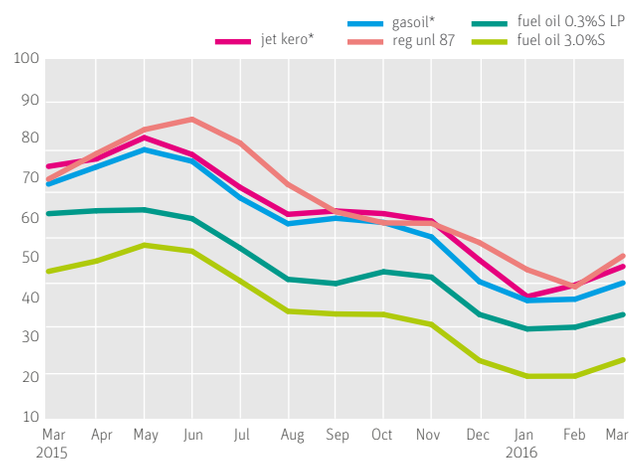


Table and Graph 6: Singapore market – spot cargoes, fob

$/b

		naphtha	premium gasoline unl 95	premium gasoline unl 92	gasoil	jet kero	fuel oil 180 Cst	fuel oil 380 Cst
2015	March	57.38	73.84	70.34	70.75	70.01	51.54	49.42
	April	59.56	75.55	73.07	72.37	72.08	54.82	52.45
	May	62.04	83.73	81.10	78.02	77.69	61.28	58.22
	June	60.89	83.97	81.02	74.73	74.56	57.08	55.73
	July	53.15	75.95	72.52	65.07	65.81	48.71	47.49
	August	45.76	66.00	61.95	57.12	57.08	39.04	37.36
	September	46.81	65.24	61.59	59.48	58.99	37.37	36.58
	October	48.92	63.39	60.55	59.13	59.28	38.32	36.99
	November	48.95	59.10	56.42	57.46	57.46	36.11	34.98
	December	45.69	55.63	52.83	46.86	47.70	28.20	27.15
2016	January	36.78	50.33	47.04	36.16	37.93	26.77	22.77
	February	33.97	44.33	41.29	38.51	40.98	25.92	23.27
	March	39.20	52.68	49.58	45.52	47.40	28.20	27.07

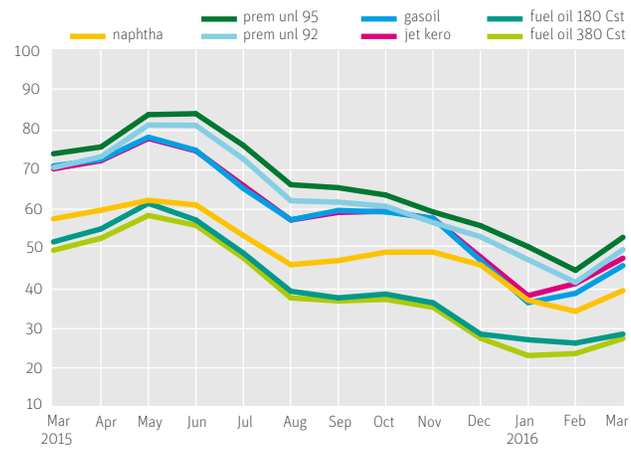
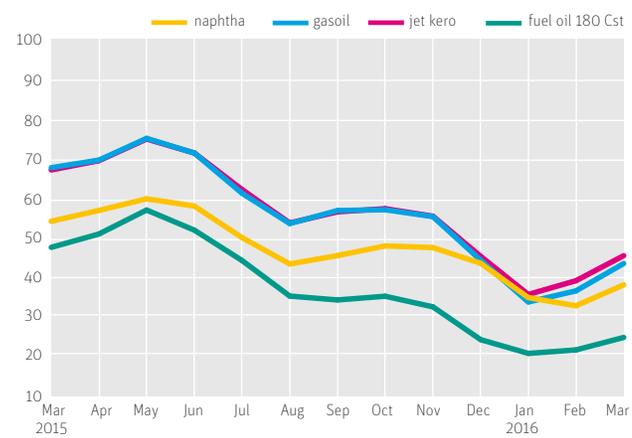


Table and Graph 7: Middle East Gulf market – spot cargoes, fob

$/b

		naphtha	gasoil	jet kero	fuel oil 180 Cst
2015	March	54.22	67.74	67.18	47.63
	April	56.96	69.66	69.51	51.01
	May	59.89	75.15	74.98	57.06
	June	58.06	71.44	71.45	51.98
	July	50.09	61.29	62.23	44.31
	August	43.45	53.64	53.79	35.34
	September	45.55	56.93	56.60	34.36
	October	48.00	57.13	57.40	35.30
	November	47.58	55.40	55.51	32.63
	December	43.62	44.42	45.39	24.35
2016	January	34.96	33.85	35.75	20.87
	February	32.89	36.66	39.22	21.75
	March	38.18	43.56	45.54	24.90

Source: Platts. As of January 1, 2016, Argus. Prices are average of available days.



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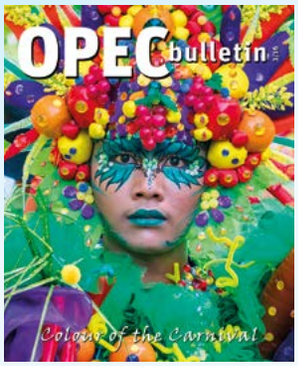

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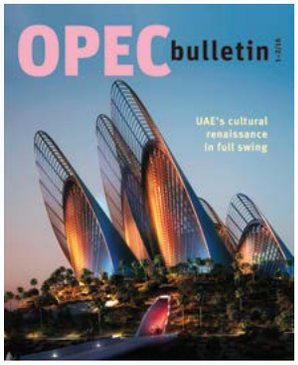

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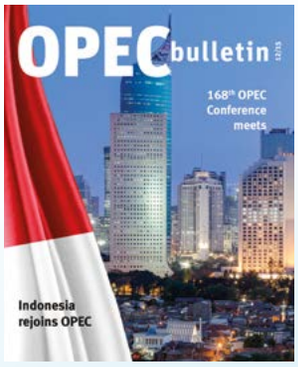

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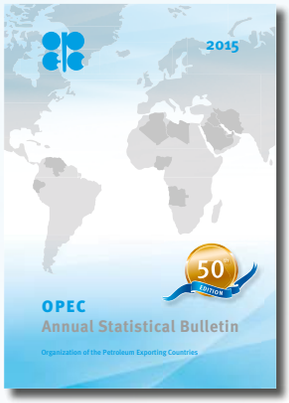

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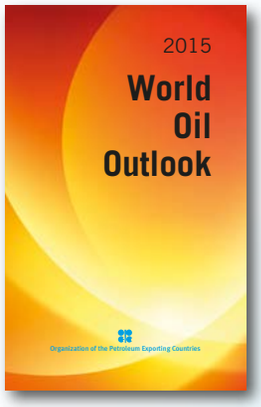

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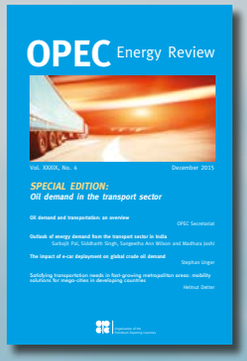

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