

OPEC bulletin

10-11/13

**Kuwait
hosts
Oil & Gas
show**

EU-OPEC Energy Dialogue

OPEC Energy Review



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We invite you to submit a well researched scholarly paper for publication in OPEC's relaunched quarterly academic journal, the OPEC Energy Review, which specializes in the fields of energy economics, law, policy, the environment and international relations.

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The criteria for publication in the OPEC Energy Review are that the material is the product of research in an area of interest and value to the readership, and that it is presented in an objective and balanced manner. Submission of a paper will be held to imply that it contains original, unpublished work and is not being submitted for publication elsewhere. Manuscripts are evaluated by referees.

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Endnotes should be indicated in the text consecutively, with superscript numbers, and should be explained in a list at the end of the text. Reference citations in the text should be by last name(s) of author (s) and date (for joint authorship of three or more names, the words '*et al*' should be inserted after the first name); references should be spelt out and listed in alphabetical order at the end of the paper (after the endnote listings). For more details of style, please refer to a recent issue of the OPEC Energy Review.

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OPEC Energy Review
Chairman, Editorial Board: Dr Omar S Abdul-Hamid
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Executive Editor: Angela U Agoawike



EU-OPEC Meeting 4

EU-OPEC Ministerial talks highlight Energy Dialogue’s “considerable progress”
Energy Dialogue instills trust and confidence – Oettinger (p12)

Kuwait Oil and Gas Show 14



Inaugural oil and gas show and conference brings the world of oil to Kuwait
Collaboration, people and technology: key aspects for oil market stability – El-Badri (p24)
Interview with Kuwait’s Oil Minister – Al-Shamali (p26)
Populating the future oil and gas industry (p28)
Unconventional reservoirs – the producers of tomorrow (p31)
Collaboration between three pillars of the oil industry (p33)
Improvements sought for movement of goods and people in the GCC (p36)

OPEC-Russia Dialogue 38



Evolving Russian relations



40

Oil & Money Conference assesses impact of tight oil
Libya has tremendous potential for development – Al-Arousi (p44)



Cover
This month’s cover shows a 1940s Kuwaiti-built dhow transport vessel, at one time owned by the former Ruler of Qatar, and now preserved at Kuwait’s Maritime Museum (see KOGS story on pp14–37).
Photograph courtesy Maureen MacNeill.

Vol XLIV, No 8, October/November 2013, ISSN 0474–6279

Forum 46



Oman Energy Forum
OPEC Member Countries must remain vigilant going into 2014 — El-Badri

Publications Launch 48



OPEC launches 2013 World Oil Outlook, Annual Statistical Bulletin

CCS Workshop 54

CCS in the CDM workshop
sheds new light on innovative subject

Spotlight 60



Georgia Tech sets benchmark for energy research excellence
A unique material for carbon capture and sequestration (CCS) (p64)

Publishers

OPEC
Organization of the Petroleum Exporting Countries
Helferstorferstraße 17
1010 Vienna
Austria
Telephone: +43 1 211 12/0
Telefax: +43 1 216 4320
Contact: The Editor-in-Chief, OPEC Bulletin
Fax: +43 1 211 12/5081
E-mail: prid@opec.org
Website: www.opec.org

Website: www.opec.org

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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 and suspended its Membership on December 31, 2008.

Newsline 66



Nature's fury

Saudi Arabia to boost output at two major fields (p68)

OPEC will ensure oil market remains well supplied — UAE Minister (p69)

In Focus 70



Congo-Brazzaville looking to capitalize on frontier oil exploration

Secretary General's Diary 74

Arts & Life 76



Chocolate and oil:

The 'seeds' of success for Venezuela

OPEC Fund News 84

OFID launches annual information programme

Vacancies 86

Market Review 89

OPEC Publications 97

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Abdalla Salem El-Badri

Director, Research Division

Dr Omar S Abdul-Hamid

Head, Energy Studies Department

Oswaldo Tapia

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Badreddine Benzida

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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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Editorial staff

Editor

Jerry Haylins

Associate Editors

Keith Aylward-Marchant, James Griffin,

Alvino-Mario Fantini, Maureen MacNeill,

Scott Laury

Editorial Team Coordinator

Angela U Agoawike

Production

Diana Lavnick

Design & layout

Elfi Plakolm

Photographs (unless otherwise credited)

Diana Golpashin and Wolfgang Hammer

Distribution

Mahid Al-Saigh

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EU-OPEC Ministerial talks highlight Energy Dialogue’s “considerable progress”



Dr Abdel Bari Ali Al-Arousi (third l), Alternate President of the OPEC Conference, Minister of Oil and Gas of Libya, pictured with (l-r) Assimakis Papageorgiou, Incoming Deputy President of the EU Energy Council, Deputy Minister for Environment, Energy and Climate Change, Greece; Nawal Al-Fezaia, Kuwaiti Governor for OPEC; Günther Oettinger, Commissioner for Energy, European Commission (EC); Abdalla Salem El-Badri, OPEC Secretary General; and Jaroslav Neverovič, President of the EU Energy Council, Minister of Energy, Lithuania.

The Energy Dialogue forged between the European Union (EU) and OPEC celebrated a mini-milestone in Vienna in early November when the two sides convened the tenth ministerial-level meeting of the initiative.

High-level officials from the two organizations pointed to the growing success of the ever-evolving energy discussions at their one-day meeting at the OPEC Secretariat, stating in a joint communiqué that “shared experiences and new insights have enhanced understanding between the two parties, with direct practical implications for their energy sectors.”

OPEC representatives at the talks included Dr Abdel Bari Ali Al-Arousi, Alternate President of the OPEC Conference, Minister of Oil and Gas of Libya; Nawal Al-Fezaia, Kuwaiti Governor for OPEC; and Abdalla Salem El-Badri, OPEC Secretary General.

Considerable achievement

The EU team included Jaroslav Neverovič, President of the EU Energy Council, Minister of Energy, Lithuania; Assimakis Papageorgiou, Incoming Deputy President of the EU Energy Council, Deputy Minister for Environment, Energy and Climate Change, Greece; and Günther Oettinger, Commissioner for Energy, European Commission (EC).

Participants stressed that the progress made by the Energy Dialogue since its inception was a considerable achievement that had benefitted both sides.

“Supported by its roundtables, workshops and studies, the Energy Dialogue has resulted in productive joint activities on a wide range of issues, covering the oil industry, the energy sector generally and associated areas, such as sustainable development and environmental matters,” said the communiqué.

Al-Arousi alluded to this fact in his opening remarks, stating that the Dialogue had been built into

something meaningful — a relationship that OPEC truly valued as one in which both parties were active participants.

“The Energy Dialogue has resulted in productive joint activities on a wide range of key topical issues ... many valuable experiences have been shared and deep insights gained in these joint exercises. These have had direct practical implications for the energy sectors of both the EU and OPEC,” he asserted.

But Al-Arousi, who was deputizing at the talks for OPEC Conference President, Mustafa Jassim Mohammad Al-Shamali, Deputy Prime Minister and Minister of Oil of Kuwait, stressed that they also needed to look at the Energy Dialogue in a broader context.

“We should also remember to keep in mind some of the acute challenges facing mankind,” he emphasized.

“A vast amount of the world’s population lives in severe poverty — even in the 21st century with the miracles of technology that are taken for granted by many. The Rio+20 Conference last year set a landmark by recognizing the important positive contribution of energy towards combating poverty.”

Al-Arousi noted that this issue had long been a feature of the Energy Dialogue, first appearing at the third meeting in Brussels in 2006.

“That meeting emphasized the pressing need for



“The Energy Dialogue has resulted in productive joint activities on a wide range of key topical issues ... many valuable experiences have been shared and deep insights gained in these joint exercises.”

— Al-Arousi



Nawal Al-Fezaia

sustainable development and the eradication of poverty in many developing countries. While acknowledging the many important steps already in place in both the EU and OPEC to address these matters, the delegates put the issue firmly on the agenda of the Energy Dialogue. In particular, they stressed the important role here for energy technology and closer collaboration. This issue is as real today as it was back then.”

Al-Arousi stated that it all underlined the importance of a stable, predictable oil market that balanced the needs of producers and consumers and, at the same time, supported steady world economic growth.

“This is a challenge facing the world community as a whole. It is a challenge that OPEC remains committed to addressing. And the Energy Dialogue that we are privileged to share with the EU provides valuable support for this commitment,” he concluded.

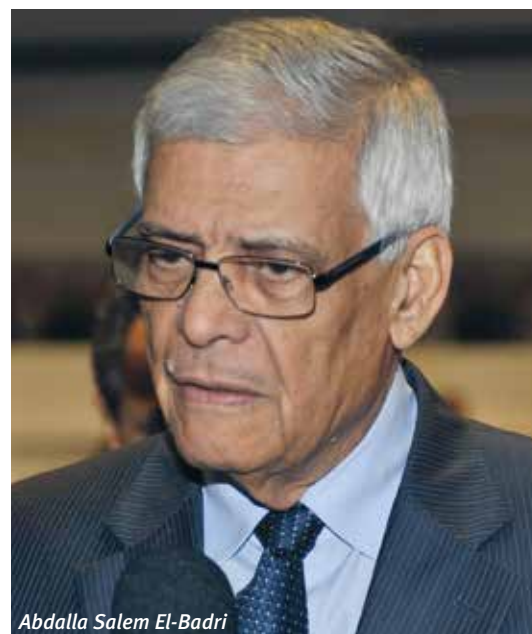
Kuwaiti Governor, Mrs Al-Fezaia, was equally as supportive of the Dialogue and remarked on the roots of its success. She observed that close trading links among some of the countries dated back not just centuries, but even millennia, especially for countries grouped around the Mediterranean and the Middle East.

“Moreover, this historic trade cut across modern political borders. It is very important to remember this,” she affirmed.

Also speaking on behalf of the Kuwaiti Deputy Prime Minister and Oil Minister, Mrs Al-Fezaia remarked that embedded within such a long trading heritage were the

“... the Dialogue reaches beyond the energy sector to cover human issues that concern both parties, notably sustainable development, poverty eradication and the environment.”

— Mrs Al-Fezaia



Abdalla Salem El-Badri

“We have achieved a lot of success ... and this success has been due to our combined wish to make the most of this Dialogue.”

— El-Badri

ideas of cooperation, dialogue, mutual dependence, enterprise, a sense of community and a collective vision.

“These are the same qualities that help drive our present Energy Dialogue,” she asserted.

Mrs Al-Fezaia pointed out that the EU and OPEC may

be very different on the economic front ... but they complemented each other well in most areas of trade, notably petroleum. This provided the basis for the Energy Dialogue.

“In addition to this, the Dialogue reaches beyond the energy sector to cover human issues that concern both parties, notably sustainable development, poverty eradication and the environment,” she emphasized.

“All this means that the Energy Dialogue is well-placed to address common challenges facing the EU and OPEC. There has already been much experience of this over the past eight years, as expressed through our joint roundtables, workshops and studies — as well as, of course, these annual ministerial-level meetings.”

Mrs Al-Fezaia stressed that OPEC Member Countries all benefitted from the activities of the Energy Dialogue.

Bringing everything together was the common understanding of the need for stable, orderly oil markets. These were necessary to support sound sustainable development in individual countries and steady growth in the world economy, she said.

Market stability had been a central objective of OPEC since its establishment in 1960.

“That is why we have been so eager to foster dialogue with other key players in the world community. The EU-OPEC Energy Dialogue is a fine example of this. And we intend to build upon its success in the future,” she concluded.

OPEC Secretary General El-Badri, in his comments to the meeting, spoke about the number of important issues the Energy Dialogue had addressed in its lifetime, stating that all those topics and the analysis undertaken had no doubt been beneficial for both the EU and OPEC.

Making the most of the Dialogue

“We have achieved a lot of success ... and this success has been due to our combined wish to make the most of this Dialogue,” he affirmed.

El-Badri then gave an overview of the oil market outlook, stating that despite the current challenges and continuing uncertainty, there had been no shortage of oil in the market and OPEC believed market fundamentals remained balanced.

From the EU side, Energy Commissioner Oettinger told the meeting that the Dialogue with OPEC had been one of the key priorities of the EU’s international energy relations.

It had allowed both parties to share expertise and



“We have set the path to continue learning from each other ... today, we need to assess what we can jointly achieve in all areas for the benefit of all parties.”

— Oettinger

knowledge, produce joint studies, and take part in site visits, as well as cooperating in difficult times when confronted with supply disruptions.

Oettinger said that all today’s changes and challenges had global implications and repercussions. “We need therefore to address them in a global perspective. This is why our cooperation and our Energy Dialogue are so important.”

He then went on to give his views on some areas in which he saw scope for further work and enhanced cooperation under the umbrella of the Dialogue, including such topics as studying energy demand and supply scenarios to provide a clear and stable medium- to long-term framework for investors and stakeholders; energy prices; increasing transparency in the industry; and supply and demand in relation to oil prices and their volatility.



Jaroslav Neverovič

“It is in the EU’s strategic interest to build and enhance comprehensive and long-term partnerships with traditional and new suppliers, as well as major consumer countries and emerging economies.”

— Neverovič

“We have set the path to continue learning from each other. In the near future, we have planned to work together on a number of joint initiatives, such as a study on energy efficiency and a study on the petrochemical industry outlook and challenges,” he stated.

“Today, we need to assess what we can jointly achieve in all areas for the benefit of all parties. I am looking forward to a frank exchange of views on what can be done and I am confident that our cooperation will continue to develop in the spirit of mutual trust and collaboration,” he added.

Close relations

President of the EU Energy Council, Neverovič, told the meeting that the EU-OPEC Energy Dialogue was to be seen as a natural extension of the close relations that had existed for decades in many areas of activity involving members of the two organizations.

The two sides had adopted similar stances on many issues. Most importantly, the Dialogue underscored two significant developments — it had institutionalized cooperation between the two organizations, and it had strengthened interdependence between the EU and OPEC.

“The stable relations achieved via this Dialogue have allowed both parties to remain focused, particularly in challenging times, on constructive exchanges to foster

market stability in the interest of both producers and consumers,” he maintained.

Neverovič said that a further enhancement of the already existing good cooperation between consumers and producers must be a priority.

“The EU looks forward to a further deepening of its relations with global oil and gas producers, both at governmental and company level,” he affirmed.

He stressed that the EU, as a major energy consumer, importer and technology provider, had an interest in the energy policy developments of all its partners across the globe.

“It is in the EU’s strategic interest to build and enhance comprehensive and long-term partnerships with traditional and new suppliers, as well as major consumer countries and emerging economies.”

Neverovič added that the various challenges and uncertainties facing the producers and consumers called for reinforced cooperation among all energy actors worldwide.

“The EU and OPEC need to strengthen their forces to find a mutually beneficial solution — meeting our needs for sustainable oil supply and demand and affordable prices to support sound economic growth,” he said.

The impressive progress made within the Energy Dialogue was also highlighted by incoming Deputy President of the EU Energy Council, Papageorgiou.

He pointed out that in these challenging times, the



“Special emphasis should be given to transparency and sharing of information ... the EU strongly supports initiatives for improving data quality.”

— Papageorgiou

excellent relations between the EU and OPEC served as an example of good cooperation and mutual understanding.

“Our intention is to work for further deepening and developing [of] these relations,” he said.

Importance of the EU

Giving a breakdown of the EU’s energy requirements, Papageorgiou said the region was the largest importer of oil and refined products globally.

Oil made up to 36 per cent of the EU’s energy consumption in 2006–10. Furthermore, 20 member states imported 95 per cent or more of their oil needs.

He said that given the EU’s strong external dependence on the supply of oil, it was vital to guarantee consumers continuous access to that oil. EU member states had high but varying levels of energy dependence, which meant they were vulnerable to energy price shocks, or energy supply disruptions.

“The need for a deepened cooperation between the EU and OPEC is therefore obvious,” he stressed.

Papageorgiou said affordable and stable oil prices were necessary for the European economy, thus leading to the mutual benefit of both producer and consumer countries.

“Special emphasis should be given to transparency and sharing of information and, in this respect, the EU strongly supports initiatives for improving data quality

provided through the International Energy Forum (IEF) and the Joint Organizations Data Initiative (JODI),” he added.

Today, the EU-OPEC Energy Dialogue is actively promoting constructive and effective cooperation on a variety of oil and energy matters.

Through open and frank exchanges and collaboration at both ministerial and technical level, the two sides are working together to enhance oil and energy market stability, bringing benefits to the global economy.

As the speakers at this year’s ministerial meeting endorsed, this interaction is enabling the EU and OPEC to better understand the current and future energy challenges, from both a producer and consumer standpoint.

Under the umbrella of the Dialogue’s joint activities, the parties are addressing the main issues involved, identifying areas of common ground, developing topics of interest and expanding bilateral relations across various levels within the two organizations.

They have put in place a variety of means to achieve this, including the annual ministerial meetings, roundtables and workshops on the most important issues, in addition to the commissioning of various reports and studies.

So far, the Dialogue has addressed such issues as oil market developments, investment, energy policies, the effects of the global financial crisis on the oil sector, the impact of financial markets on oil price volatility, biofuels and their impact on the refining sector, and energy

technologies, including the innovative process of carbon capture and storage.

More recently, the Dialogue has looked at safety issues in the offshore oil and gas industry, as well as potential manpower bottlenecks in the energy sector.

The move to set up the Energy Dialogue was actually made by the EU. The proposal for the alliance was mooted at the IEF Meeting in Amsterdam in May 2004. The first ministerial meeting of the Dialogue was then held the following year.

Dialogue and cooperation

The approach by the EU was warmly welcomed by OPEC, which, since its inception in 1960, has made repeated calls for dialogue and cooperation between the main oil-producing and consuming countries.

OPEC considers cooperation and coordination as representing the best means of securing oil market stability and supply and demand equilibrium.

The Organization has also continually stipulated that for any dialogue to be effective, it must be structured, regular and held at the highest policy-making level. The EU-OPEC Dialogue is viewed as such a case in point.

At this year's talks, participants welcomed the more favourable news on the global economic front.

The joint communiqué pointed out that the outlook for the oil industry had improved since the 2012 Ministerial Meeting.

In fact, for the first time in many years, OPEC had raised its long-term reference case projections for world oil demand growth, it observed.

The more positive economic signals emerging from the EU, particularly the Eurozone, were also underlined.

However, participants urged an air of caution about over-reacting to the current positive economic trends, which they considered were a gradual process.

But they stressed that the Energy Dialogue was well-placed to address the common challenges facing both the EU and OPEC and there was an underlying recognition of the need for stability, both in the energy sector and in national economies, "in the interests of steady, sustained economic growth across the world as a whole."

In a busy agenda, and following the introductory speeches, the first session of the meeting examined the market outlook and developments from the short term up to 2035, as well as reviewing energy and climate policies.

In making the opening presentation, Hojatollah

Ghanimi Fard, Head of the OPEC Secretariat's Petroleum Studies Department, noted that after a sluggish first quarter, the momentum had increased, fuelled mainly by the performance of the OECD economies, while the developing economies had largely seen a slowdown in their high growth rates of recent years.

Many risks remained, he said, including the ongoing fiscal and monetary uncertainties in the United States, the continuing challenges facing the Eurozone, Japan's uncertainty in lowering its debt-to-GDP ratio and an uncertain outlook for China's financial system.

Ghanimi Fard maintained that the oil market continued to be well supplied, with sufficient crude production from OPEC Member Countries and a robust increase in non-OPEC supply, mainly from North America.

Healthy OECD stock levels and a continued rise in the non-OECD region signalled that the market's needs were being fully met. OPEC production capacity would provide an additional cushion for the market, he affirmed.

In the next presentation, the EU's 2030 framework for the region's climate and energy policies was addressed by Fabrizio Barbaso, Deputy Director-General, Directorate-General for Energy at the EC.

He said the EC had adopted a Green Paper in March this year on 'A 2030 framework for climate and energy policies', stating that developing such a framework was needed to reduce regulatory risk for investors and to mobilize the funding needed to support progress towards a competitive economy and a secure energy system.

EU 2013 framework

The document further emphasized that such a framework was required to establish the EU's ambition level for its greenhouse gas emission reductions, in view of a new international agreement on climate change foreseen for adoption in 2015, he stated.

Barbaso stressed that the EU's 2030 framework would build on the experience learnt from the 2020 framework and would identify where it believed improvements were needed. It would also aim to ensure progress towards longer-term energy and climate objectives, but, at the same time, take into account security of supply and competitiveness issues.

He disclosed that the EC was due to present its proposals on a 2030 framework for the EU in early 2014.

OPEC, through Oswaldo Tapia, Head of the Secretariat's Energy Studies Department, then provided



Officials from the EU and OPEC assemble for a group photograph.

an assessment of the long-term oil outlook, in which its reference case saw energy demand rising by 52 per cent in 2010–35.

Tapia said fossil fuels would account for 80 per cent of global energy supply by 2035, while oil was expected to remain dominant in meeting the world's energy needs, with demand reaching 108.5 million barrels/day by 2035, an annual increase of 900,000 b/d. Developing Asia would account for 88 per cent of the increase.

He noted that transportation was key to the rise in demand. In satisfying demand growth, there were abundant resources with a wide variety in liquids supply. While tight oil had been a primary driver of recent supply

increases, he said that inherent constraints might appear over the longer term.

Tapia stipulated that all the projections were subject to the effects of uncertainties in such areas as world economic growth, technology and policy-making. These uncertainties underlined the fact that security of demand and supply were two sides of the same coin.

He also underlined how future climate change-related policies and measures might affect the use of fossil fuels in general and oil in particular.

Downstream, falling utilization rates pointed to the need for refinery closures in the coming years, especially in the OECD countries.

Taking the floor again, Barbosa then closed the first session with a review of the EU's key external energy policies.

He stated that at the international level it was confronted with increasing import dependence in some forms of energy in a world with rising global energy demand.

Engaging with all stakeholders

He emphasized the need to engage with all stakeholders to address issues related to security of supply and demand, climate change, environmental protection, improving access to sustainable energy for developing countries, and competitiveness.

Barbosa stressed that all these issues had trans-border effects and needed to be addressed in an international perspective.

The second session focused on the current status of the Energy Dialogue and discussed its future activities.


Massimo Lombardini, Policy Officer, Directorate-General for Energy at the EC, presented a summary of the conclusions of the joint roundtable on 'Safety of the offshore oil and gas industry', held in Brussels in November 2012, as well as the joint study on 'Potential manpower bottlenecks in the oil and gas industry' and the accompanying roundtable held in Brussels in June 2013.

And in reporting on the Dialogue's current and future activities, Jorge Leon, OPEC Energy Demand Analyst, noted that a joint study on the outlook and challenges for the petrochemical industry would be started, followed by a roundtable.

Meanwhile, he informed, deliberations on another joint study — on energy efficiency — were still in progress.

Additionally, joint experts' meetings were planned for technical exchanges and discussions on the most recent oil outlooks and energy scenarios of both OPEC and the EU.

A report on these activities would be submitted to the 11th Meeting of the Energy Dialogue, scheduled to take place in Brussels in 2014, added Leon.

Participants expressed satisfaction with the outcome of the meeting and saw it as another important step in the Energy Dialogue, to which both parties expressed their continuing commitment in the spirit of mutual trust and cooperation. 



*European Energy Commissioner, **Günther Oettinger** (pictured above), a familiar face at EU-OPEC Ministerial Meetings, has high praise for the initiative, which he sees as being essential for bridging the divide between oil producers and consumers and reaching a common understanding on the main issues involved. The OPEC Bulletin's **Maureen MacNeill** spoke to him briefly and asked him for his impressions on the latest talks in Vienna.*

Energy Dialogue instills trust and confidence

— *Oettinger*

Question: This is the 10th EU-OPEC Ministerial Meeting to be held since 2005 and a big success I think for both parties involved. How has the dialogue evolved over the years and what have the talks brought to the European Union?

Answer: OPEC Member Countries have been important partners for the European Union's oil and gas markets for decades. And for the years ahead, EU countries will continue to need to import oil and gas and OPEC Countries are both able and interested to export that petroleum to our oil and gas companies. This important relationship is an industrial one and a political one too. For this arrangement, we need trust and confidence and this Energy Dialogue is the best guarantee for us to have a good level of trust and confidence.

We are working together in the best manner possible — we have common projects, we have an exchange of views, and we are looking at all the facts and figures. We have a short-term analysis, as well as long-term outlooks. And so we are connected. It is a real, functioning win-win situation for our industries and for our policymakers.

What can you tell us about today? How were the talks?


They were constructive — good. Today's main issue was the long-term outlook up to 2035 put forward by OPEC,

an outlook that covers the oil and gas markets for the next 20 years or more.

There is also an ongoing process for the communication coming from the European Commission side, which should be developed as a European energy policy and a European climate change policy beyond 2020 — in fact, up to 2030. We need to connect these two long-term activities and to come to a common understanding. That is key — it was key in our talks today.

I know that you have your own energy goals for 2030 in the European Union. Can you explain them a little bit and maybe describe how OPEC can help the EU meet its goals?

There is no decision at the moment, but we are ambitious to have a new CO₂ emissions reduction target in place. Maybe we will also speak about a new renewables target in our European energy mix and there is no doubt we need growth and development and we need industries and so we need acceptable prices for gas and power, as well as an open market with competition.

We are also aware of the United States shale gas revolution and we need to determine what the follow-up for that is in Europe and for OPEC gas suppliers. This was also one of today's main points. 



Inaugural oil and gas show and conference brings the world of oil to Kuwait



HH Sheikh Jaber Mubarak Al-Hamad Al-Sabah (third right), Prime Minister of the State of Kuwait; pictured with (l-r) Waleed Rafaay, Managing Director of the Middle East, North Africa and India for the Society of Petroleum Engineers; Hashem S Hashem, Executive Chief Officer, Kuwait Oil Company (KOC); Egbert Imomoh, 2013 SPE President; Mustafa Jassim Al-Shamali, Deputy Prime Minister and Minister of Oil for the State of Kuwait; Nizar Al-Adsani, Chief Executive Officer, Kuwait Petroleum Corporation (KPC); Hosnia Hashim, Vice President Operations, Kuwait Foreign Petroleum Exploration Company (KUFPEC).

*Small in size, but significant in stature — the Gulf state of Kuwait has made startling progress in recent years thanks to the help of its oil sector. Today, the country stands as one of the leading lights in the global petroleum industry. This enviable mantle was evidenced at the inaugural Kuwait Oil and Gas Show and Conference, held in the country’s capital in October. Hailed as “Kuwait’s own” and “a great success”, the four-day event attracted well over 3,500 participants, with 162 exhibitors from 20 countries. The OPEC Bulletin’s **Maureen MacNeill** was part of a team invited to attend from the OPEC Secretariat in Vienna. In her comprehensive coverage, she reports on the issues addressed at the busy event, and also looks at some of the interesting topics discussed in sessions held on the sidelines of the main gathering.*



Mustafa Jassim Al-Shamali (c), Deputy Prime Minister and Minister of Oil for the State of Kuwait, inaugurating the exhibition.



Kuwait may be small in size, but it is mighty in deed. As Society for Petroleum Engineers (SPE) President, Egbert Imomoh, said in his opening speech at the Kuwait Oil and Gas Show and Conference (KOGS), “don’t judge a book by its cover”.

“I borrow this idiom as it relates to Kuwait,” said Imomoh. “When you think of a map of the region, you see that Kuwait is relatively small compared to the countries that surround it. However, its size has not affected its importance and position on the global stage.”

Indeed, with 15 months of planning, the inaugural KOGS 2013, was a great success, according to the event’s organizers.

With OPEC statistics showing Kuwait has the fifth-largest proven oil reserves worldwide, has the sixth-largest production and is the seventh-largest exporter of crude, said Imomoh, the country “is a major force in the petroleum industry and it is high time it had its own oil and gas show and conference.”

Held under the patronage of the Prime Minister of the State of Kuwait, His Highness Sheikh Jaber Mubarak Al-Hamad Al-Sabah, on October 7–10, the event featured 162 exhibitors from 20 countries worldwide.

Speaking in his native Arabic language, Kuwaiti Deputy Prime Minister and Minister of Oil, Mustafa Jassim Mohammad Al-Shamali, welcomed guests, delegates and exhibitors to the event. He had earlier in the conference programme spoken of the challenges facing the energy

sector today and how such gatherings can help in addressing them.

“Today the oil and gas industry seeks increasingly innovative solutions to meet growing demand for energy in the face of ever more difficult challenges,” he affirmed in the welcome letter.

“This important event attempts to address some of these challenges and it brings together an extraordinary and welcome level of expertise to one of the most prolific hydrocarbon regions in the world.”

Shaping the future

According to Al-Shamali, the conference offers an important forum and opportunity for participants to contribute, debate and provide solutions that will shape the future industry and the region.

“The exhibition serves as an important showcase for the latest technologies, whilst acting as a conduit for the strategic collaborations and healthy competition that helps drive us forward,” he stated.

The conference and its theme ‘*The power of collaboration, people and technology in the oil and gas industry*’, he added, highlighted the importance of cooperation and “challenges the oil and gas industry to move forward with adaptively intelligent technologies, out-of-the box business models and exceptional human skills.”

In fact, the conference theme invoked lively dialogue



HH Sheikh Jaber Mubarak Al-Hamad Al-Sabah, Prime Minister for the State of Kuwait.



Mustafa Jassim Al-Shamali, Deputy Prime Minister and Minister of Oil for the State of Kuwait.



Hashem S Hashem, Executive Chief Officer, Kuwait Oil Company (KOC).



Hosnia Hashim, Vice-President Operations, Kuwait Foreign Petroleum Exploration Company (KUFPEC).

among senior keynote speakers over four executive-level panels and one special session at the four-day event. There were also 17 technical sessions, along with more than 100 presentations.

Youth participation was encouraged, with more than 200 students joining in education day, according to Hashem S Hashem, Chief Executive Officer of the Kuwait Oil Company (KOC), and one of the conference organizers.

“We have 1,500 conference attendees, 2,200 delegates to the exhibition floor — 3,700 participants in total. It is the absolute highest number of delegates to Kuwait,” said Hashem in his closing remarks.

He added: “Today we are being challenged to go beyond the organizational, national and social boundary and find all those new ideas and new advantages. KOGS is part of this initiative and has gone beyond our previous attempts to establish a new frontier for events in Kuwait.”

Hosnia Hashim, Vice-President of Operations in the Kuwait Foreign Petroleum Exploration Company (KUFPEC) and KOGS organizer, stated in an interview with the *OPEC Bulletin* that she pushed to have such an event in Kuwait after travelling with the SPE as a board member and director around the world.

“When I went to those meetings, I saw everywhere big conferences for the country and region, so I thought ‘Why not Kuwait?’” said Ms Hashim. “There are huge challenges for the next years (in Kuwait) and new technology.

We have some technology we can share with the industry and we would like the industry to come to Kuwait because we have a huge \$100 billion investment for projects.”

The theme of the conference was chosen “because our industry is a huge industry and we are facing huge challenges and every year there is a new challenge,” said Ms Hashim, adding that without cooperation between service companies, international oil companies (IOCs) and national oil companies (NOCs) the industry will not grow.

This theme was elaborated upon by speakers at the Executive Plenary Session on the first day, a panel that included OPEC Secretary General, Abdalla Salem El-Badri.

Three main themes

“The three core themes of this session — collaboration, people and technology — have been at the forefront of the oil and gas industry since its very beginning. And these three elements are clearly entwined. Technology and people have combined to continually transform our industry, playing a fundamental role in supporting the efficient production of hydrocarbons,” he said.

El-Badri pointed to Kuwait’s oil industry as an example, highlighting the discovery of the supergiant Burgan field back in 1938. “Very few would have predicted that field would still be pumping today. It remains central to Kuwait’s oil industry.”

Technological advances have enabled the industry to increase estimates of the amount of oil and gas that can be found and recovered, said El-Badri. "... peak supply will arrive one day. But at present, this day is being pushed further and further into the future."

Technology, people and collaboration will remain central to the industry's future, added El-Badri, including advancements in carbon capture and storage, enhanced oil recovery and the development of new oil-based materials.

Population pressure, the need for social development and economic growth will all lead to an increase in energy demand, which is expected to rise by 50 per cent by 2035, and although oil's overall share of the energy pie will fall by this time, demand will still increase by 20 million barrels/day, he said.

"With this expansion comes the need for more technological innovation, additional human resources and greater collaboration, so that we may produce the required volumes in a secure, safe and environmentally sound way.

"These three entwined issues are essential to the short- and long-term market stability that we all desire," he added.

El-Badri added in his final statement: "As an expert, not as the OPEC Secretary General, the history of NOCs and IOCs is over now. Everyone knows what they are doing. We should have some kind of relationship that we can cooperate with each other." (*See El-Badri's address on page 24*).

Moderator Adnan Shihab-Eldin, Director General of the Kuwait Foundation for the Advancement of Sciences (KFAS), stated that he was pleased that the OPEC Secretary General had brought in the very timely example of Burgan. "How it was the product of collaboration, technology and human resources, and that is what we are looking for in Kuwait in the future."

Saudi Aramco's Vice-President of Petroleum Engineering and Development, Khaled A Al-Buraik, acknowledged three very important collaborations: the Al-Khafji joint operation with KOC; the partnership with IOC Total in the colossal, 400,000 b/d Saudi Aramco Total Refining and Petrochemical Company (SATORP) joint venture refinery in Jubail; and Saudi Arabia's membership in OPEC, which he called "a model of professionalism and support for Member Countries."

On the issue of technology, he stated: "Technology is the core of what we do. Our vision is to harness technology to create opportunities."

He stated that Saudi Aramco is in the midst of a



Abdalla Salem El-Badri, OPEC Secretary General.

strategic transformation to make it an industry leader, including becoming a major developer of technology in areas critical to its performance.

Technology is key

"We see technology enhancement, but are more focused on creating the breakthrough, disruptive technologies. Accordingly, our research and technology development programme has ambitious, long-term and far-reaching goals. We geologists, geophysicists, petrophysicists, reservoir production and drilling engineers and others are being asked to adapt a multidisciplinary mindset to work together, coordinated around common objectives.

"Still the physics and chemistry of hydrocarbon recovery are not fully represented in conventional reservoirs and are even more complex for the unconventional ones."

The company is not only focusing on the downstream; upstream research is being undertaken into energy efficiency and cleaner fuel formulation, as well as new petroleum fuel solutions, said Al-Buraik.

He added that, recognizing that the bedrock of its success lies in people development, the company starts its human resources plan at the high school level, where "for many years we have recruited our workforce for both vocational and professional track talent."

Saudi Arabia, unlike other countries, has a relative abundance of young people. Currently, Saudi Aramco



Khaled A Al Buraik, Vice President, Petroleum Engineering and Development, Saudi Aramco.



Nizar Al-Adsani, Chief Executive Officer, Kuwait Petroleum Corporation (KPC).

sponsors about 2,000 undergraduate and graduate level students in their studies, both in the Kingdom and in other parts of the globe.

A new upstream professional development centre brings fully fledged professionals on board in two years, instead of the typical three to four years, noted Al-Buraik, who said that some of this young talent will end up in the research and technology centre, “where by 2020 we are committed to triple our scientist manpower. Along with this intention, we intend to increase our research funding by five-fold.

“All told, Saudi Aramco has one of the largest training and development programmes of any institution in the world.”

The company’s strategy on collaboration involves both breaking down internal barriers among disciplines and crossing external boundaries between institutions, research and industry.

As part of this effort, a science park has been developed under the Kingdom’s King Fahd University of Petroleum and Minerals adjacent to the Saudi Aramco headquarters. This environment “stimulates cross-fertilization of ideas and accelerates technology commercialization, as the new ideas can easily move from research into deployment in the nearby major oil and gas fields.” In addition, it is creating a network of satellite research centres in Asia, the United States and Europe.

Al-Buraik added a fourth pillar to discussions: the

environment. In addition to cleaner fuel, Saudi Aramco is focusing research on transformative technologies for managing carbon dioxide (CO₂) from both fixed and mobile sources, he said.

Also, the company has created a commercial opportunity involving wastewater treatment and introduced an innovative approach towards protecting marine ecology while still being able to produce the country’s petroleum resources.

“I find this an exciting time to be a professional at my company. This is a once-in-a-generation moment as we move to transform ourselves,” said Al-Buraik. “There is indeed power in the combination of technology, people and collaboration. I ask that you share my enthusiasm and hope. The day is coming when our region will achieve remarkable research and technology breakthroughs to unlock new resources of hydrocarbons and find valuable new uses for these resources.”

Nizar Al-Adsani, Chief Executive Officer of the Kuwait Petroleum Corporation (KPC), stated that the challenges ahead are great, with the emergence of new competitors, supply and demand dynamics, social and environmental pressures and demographic shifts.

KPC faces a common problem in the industry today—scarcity and aging of skilled human resources. The company, he said, is determined to build the skills of KPC’s workforce through specialized schools and universities.

“We are focusing on means and ways to identify and



R–l: Abdalla Salem El-Badri, Secretary General, OPEC; Khaled A Al Buraik, Vice President, Petroleum Engineering and Development, Saudi Aramco; Nizar Al-Adsani, CEO, Kuwait Petroleum Corporation (KPC); Patrick Pouyanne, President, Refining and Chemicals, Total; Adnan Shihab-Eldin, Director General, KFAS.

retain our critical workforce segment. Our employees are the most precious assets that we will invest in and we will develop their capabilities and skills.”

KPC has ambitious plans to enhance its role in the international oil industry, with a focus on upstream development. “Achieving our production growth target of one million [additional] b/d by 2020 and maintaining this through 2030 depends on the successful implementation of advanced technology involved in both improved and enhanced oil recovery,” said Al-Adsani, adding that future project spending in the next five years should reach \$100bn, of which 60 per cent will be spent on upstream project expansion inside and outside of Kuwait.

The additional production capacity is expected to come from highly complex reservoirs and the corporation currently does not have sufficient skills, expertise or knowhow to extract the resources from these on its own, he said.

“We definitely need the assistance of IOCs to work with us in a more acceptable form of a win-win basis to achieve all these strategic starts. However, any relationship with IOCs should also fulfill Kuwait’s interests and concerns.”

In addition, KPC plans to partner with major service companies and international scientific institutions in order to achieve its goal.



Patrick Pouyanne, President, Refining and Chemicals, Total.



Egbert Imomoh, 2013 SPE President.

Total's President of Refining and Chemicals, Patrick Pouyanne, said he prefers the word partnership to collaboration, stating: "In the last decade I have seen our industry change significantly and the complexity and size of projects constantly increase. How can we address this challenge if not with full collaboration from all players towards this common objective?"

The company was 'born' in the Middle East in 1934, he said, and "we believe a long-term relationship is of the essence. As a result of this continuous dialogue over time with our Middle Eastern partners, we are one of the IOCs with the most diversified activities."

Regional presence

This has led to the presence of about 2,000 Total employees in the region. In its quest to develop new projects and partnerships with the oil companies, Total offers to "mobilize its highly skilled human resources and share its technology and operational knowhow, expertise in project management and its capacity in financing multi-billion dollar projects," said Pouyanne.

"Total also brings acceptability to the table. This means bringing concrete answers to the legitimate ambitions of the host countries of turning their natural wealth into long-term socioeconomic development."

He said that, more than ever, oil and gas companies have to continue to demonstrate their technical and

operational excellence and "it remains a core competency of a major IOC like Total to be able to combine all techniques and technologies and integrate all of them, in order to develop comprehensive projects managing all the risks.

"Bringing energy to people requires a capacity to develop megaprojects."

As an example, he also mentioned the Saudi Aramco-Total Jubail refinery, a \$10bn project that employed 40,000 workers at the peak of construction. "It has been a human adventure. [It] is a success within the human people who collaborate to make this plant effective."

Research and development programmes are essential for an IOC to keep its edge, he added. Total has recently developed a supercomputer in France which allows it to model complex reservoirs to be able to increase hydrocarbon recovery rates.

It has also started a research centre in Qatar, where new technologies are being developed and which allows for a way to develop collaboration and transfer of knowhow. The company has a long history with Qatar, stemming from the 1930s and including many large-scale projects along the way.

"If we want partnerships to be successful in the long run, we need to not only bring technology and knowhow, to bring our competence in megaprojects, but also to address a country's expectations. So I mention the transfer of knowhow which is quite natural to our joint ventures



and a common objective to develop skilled manpower able to serve our industry,” said Pouyanne.

To that end, the company signed a partnership this year with Kuwait University to promote the talent of young Kuwaitis in the Kuwait University’s College of Engineering and Petroleum. Another initiative started this year brings young Middle Eastern leaders together with regional experts and speakers to focus on energy and leadership issues.

“Bringing energy to people is indeed a challenging task, but we NOCs, IOCs and service companies are all facing the same challenge. To reach this objective we need excellence, technology, safety. We also need listening and trust – listening to the expectation of the other party is key and trust is required, in order to be able to define the right contractual framework that allows each



Abdalla Salem El-Badri (c), OPEC Secretary General, receiving a memento from Saudi Aramco.

party to get an acceptable reward for its commitment,” concluded Pouyanne.

Questions and answers

The question and answer session touched on shale oil developments in the US and how they could impact the Gulf region, to which OPEC Secretary General, El-Badri, answered: “Now the US is producing 2.6 or 2.7m b/d of tight oil. This will grow to 4.5 or 4.7m b/d by 2018 – then it will decline.

“From 2018 to 2035, OPEC production must go up and it will reach 37m b/d. [Oil companies here] are investing and we encourage that because we need investment. OPEC is the only source of production that will satisfy the market. There will be no impact on our Member Countries as we see it at this time.”

He added that it is not possible to replicate the US’s



Pictured above and right are exhibition stands of Saudi Aramco and Iraq’s Ministry of Oil.





success in tight oil elsewhere in the world because of the water, space, technical people, working rigs and equipment required.

“The area producing now is very huge, there are no inhabitants and a lot of workers. Nobody cares about the aquifer, nobody cares about the trucks, nobody cares about the noise, so they are producing freely. But to duplicate this in Europe? I tell you, it is impossible.”

Pouyanne added that shale gas and oil are indeed very capital intensive and that although it is quite easy for IOCs to have access, Total favours participating with OPEC Countries in a long-term future and in more traditional capital markets.

There will be competition for the Asian markets in the next three or four years due to shale oil and gas, stated Al-Adsani. “This is becoming evident in 2014 and will probably stay that way in the short to medium term. But in the long term, there will be great demand for OPEC [oil].”

Another topic touched upon was the role of alternative energies within the oil industry in the region, to which Al-Buraik responded: “Demand for fossil fuels will be dominant. Every single BTU will be needed to satisfy global development. So I think renewables or alternative energy will be needed, if not today, then in the future ... it is still in the early stages. A kilowatt from solar energy is two to three times more expensive than what you get from fossil energy.”

However, Pouyanne stated that Total already has a 100 MW solar plant in Abu Dhabi, which is working well and producing at acceptable costs. “Solar is a very interesting energy because there is huge potential for improvement in technology. Theoretically, the efficiency of solar

cells could go up to almost 50 per cent and it is currently at 24 or 25 per cent for the best cell. It is not competing with oil and gas.”

Imomoh stated that some problems in the world now require multi skill sets that never exist in one person. The premise is now applied in the industry, “but we must be more aggressive in our efforts to collaborate.”

He continued: “Your presence here moves us one more step closer to the future of our industry, but I challenge you to advance that even further. Take what you see, hear and learn back to your companies, your colleagues, to your communities and apply the knowledge you will acquire to every day of your work.”

The next KOGS is scheduled to be held in two years – in October 2015.

Pictured above are the exhibition booths of Algeria's Sonatrach (l) and the OPEC Secretariat (r).

Below: The OPEC Secretariat team, with Abdalla Salem El-Badri (second left), Secretary General; with (l-r) Abdullah Al-Shameri, of the Office of the Secretary General; Zoreli Figueroa, PR Coordinator and Officer-in-Charge, PR & Information Department; James Griffin, Maureen MacNeill; and Elfie Plakolm. Diana Golpashin took the photograph.





Collaboration, people and technology: key aspects for oil market stability

— El-Badri

Collaboration, people and technology are all key factors necessary for helping to bring about stability in the international oil market and ensuring that the world has enough oil supply to meet demand.

That was the view put forward by Abdalla Salem El-Badri, OPEC Secretary General, to the Kuwait Oil and Gas Conference, in Kuwait City, in October.

Addressing the three day-event's executive plenary session, he said that without new people, without new technologies and without collaboration the oil industry would go backwards.

"These three entwined issues are essential to the short- and long-term market stability that we all desire," he told assembled delegates.

El-Badri maintained that the three core themes, which were the subject of the executive session, had been at the forefront of the oil and gas industry since its very beginning.

"Technology and people have combined to continually transform our industry, playing a fundamental role in supporting the efficient production of hydrocarbons," he affirmed.

Over the years, he said, technological advancements had helped people to push the limits of the industry.

Giving examples, he said they had extended the industry's reach in terms of the way resources were identified and developed; addressed the goals of better, faster, cheaper, and safer operations in both the upstream and downstream; and produced cleaner and more efficient petrochemical products.

"To put it simply — collaboration, people and technology have allowed the industry to survive and thrive, despite the many challenges it has faced."

El-Badri noted that the history of Kuwait's oil industry was an excellent example. Back in February 1938, oil was discovered at the country's Burgan field, with commercial oil production beginning in 1946.

"It was a great find for Kuwait, but very few would have predicted that this field would still be pumping today. Burgan turned into a 'giant' oil field and it remains central to Kuwait's oil industry," he stated.

In Burgan's long history, continued El-Badri, people and technology had combined to tap into the reservoir, expand its recoverable resource base and apply improved recovery techniques, so that more of the oil in place could be produced.

"There are similar stories to be found across the world, with people working together to continually push the boundaries of technology," he professed.

The OPEC Secretary General said that technological advancements had enabled the industry to increase the estimates of the amount of oil and gas that could be found and what could be recovered.

Improvements in the quantity and quality of information about different geological structures had enhanced the likelihood of finding oil and gas and had extended the reach of the industry into harsher and more remote locations in 'frontier areas'.

"Of course, when talking of fossil fuels we need to recognize that they are non-renewable resources, so peak supply will arrive one day. But at present, this day is being pushed further and further into the future," he contended.

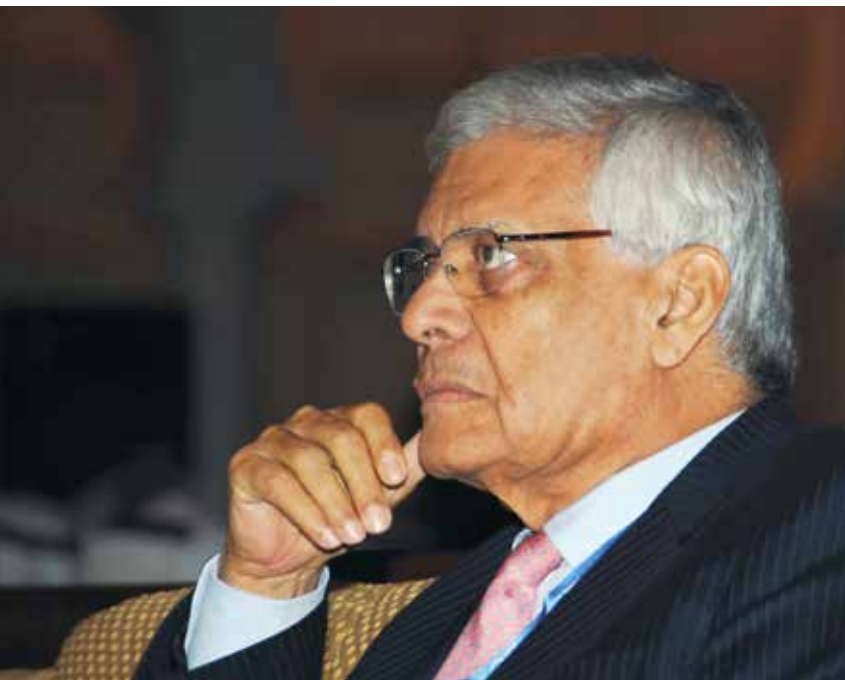
For oil, said El-Badri, estimates from the United States Geological Survey of ultimately recoverable resources had more than doubled since the early 1980s — from just 1.7 trillion barrels to over 3.8tr b. Cumulative oil production had been less than a third of this.

And when looking at recovery rates, he said these had increased from less than ten per cent of oil in place in the early history of the industry, to in excess of 70 per cent in some fields today.

In terms of drilling, El-Badri observed that the industry had progressed from drilling tens of metres to many kilometres below the surface, both vertically and horizontally.

And the industry, as a whole, had evolved from basic geological sciences to reservoir simulators, state-of-the-art IT, 3D views of deep and complex horizons in the sub-surface, large offshore drill ships and huge data mining activities to optimize performance.

From the downstream perspective, he said, the development of the fluid catalytic cracking process for



Abdalla Salem El-Badri, OPEC Secretary General.

upgrading heavy crude components had allowed the industry to produce increasingly lighter products and much larger volumes of transportation fuels. And desulphurization technologies had enabled the industry to reduce the environmental impact of sulphur emissions.

“And looking to the future, the industry can be expected to see technologies shift perceptions and prospects once more. For example, through carbon capture and storage, further advancements in enhanced oil recovery and the development of new oil-based materials for various industry sectors,” he said.

El-Badri told the conference that it was clear that technology, people and collaboration would remain central to the industry’s future.

“And we need to see the future as an ever evolving one, where standing still is not an option. This is easy to appreciate when we look at some important global trends. First, although the global economy today remains fragile, we can expect to see it rebound.

“Second, world population is predicted to reach 8.6bn by 2035, an increase of over 1.5bn from today’s level, with the expansion overwhelmingly in developing countries and urban areas.

“And thirdly, we need to remember that around 1.4bn people still have no access to electricity and some 2.7bn continue to rely on biomass for their basic needs.

“There is much potential for social progress and making improvements in people’s living conditions — by

providing light, power and mobility. For example, in developing countries, car ownership averages around 40 cars per 1,000 inhabitants, far lower than in OECD countries, where it is almost 600 per 1,000 inhabitants.”

The OPEC Secretary General said that all this pointed to the fact that energy demand would rise. It was expected to increase by over 50 per cent by 2035 and all energies were set to witness growth.

“However, it will be fossil fuels that remain dominant in meeting energy demand for the foreseeable future. They currently account for 82 per cent of global energy demand and will still make up over 80 per cent by 2035,” he emphasized.

Of all fossil fuels, said El-Badri, natural gas was expected to witness the fastest growth rate, at close to 2.5 per cent annually. And its overall share in the fuel mix was set to rise gradually.

“For oil, although its overall fuel share falls between 2010 and 2035, demand still increases by more than 20m b/d over this period, reaching almost 110m b/d by 2035.”

Clearly, said El-Badri, with this expansion came the need for more technological innovation, additional human resources and greater collaboration,” so that we may produce the required volumes in a secure, safe and environmentally-sound way.

“However, we need to recognize that one of the three key elements of this session is now a cause for some concern. Globally, there is a shortage of young people entering the industry. It is vital that this is rectified.

“To do this, we need to understand the reasons behind this global shortage. There is the current global economic climate, which is obviously impacting job prospects in many industries across the world.

“There is the large-scale downsizing that led to a lack of recruitment in the energy sector during the 1980s and 1990s. At that time, many universities cut back drastically on students in energy-related programmes because the industry did not need graduates in high numbers.

“In recent years, there has also been a dramatic expansion in the services industry and ‘emerging knowledge’ economies, all of which has led to fierce competition for talent.

“And there is also a sizeable section of the industry’s workforce that is now rapidly approaching retirement, particularly those that entered the industry in the 1970s. This was an issue specifically highlighted in a recent study by the European Union and OPEC, entitled *Potential manpower bottlenecks in the oil and gas industry.*”

El-Badri maintained that meeting the human resource challenge would not happen overnight. “We must look long-term. The industry is one characterized by long lead times, and often long payback periods, which means it must view employees as long-term assets.”

Turning briefly to the current oil market situation, El-Badri said OPEC saw the market as being balanced. There had been — and there remained — enough supply to meet demand. “We also see this as the case for the rest of 2013 and hopefully for 2014 with stock levels and OPEC spare capacity continuing to support the supply and demand outlook,” he added.





Interview with Kuwait's Oil Minister

Mustafa Jassim Mohammad Al-Shamali (pictured) is Kuwait's Deputy Prime Minister and Minister of Oil. He is also President of the OPEC Conference. Following the very successful inaugural Kuwait Oil and Gas Show and Conference, the Minister answered a series of questions prepared for the OPEC Bulletin.

As part of your role as Deputy Prime Minister and Minister of Oil of Kuwait, you also inherit the Conference President position for OPEC. How do you view this role and what do you hope to bring to this position?

As you are aware, the Presidency of the OPEC Conference is rotated, and Kuwait assumed this position from January to December 2013. Kuwait has played an effective role in support of overall conformity within OPEC and has also supported all of OPEC's decisions to enhance its role of securing adequate supplies to the international markets. We will continue to strengthen and facilitate OPEC's role internationally through coordination with the OPEC Secretary General. In doing this, our aim is to be in communication with the various market observers and players to calm down markets.

At the recent Fifth Asian Ministerial Energy Roundtable Meeting in Seoul, Kuwait announced that it wants to expand bilateral energy cooperation, not only in crude oil trading but in other fields, as well as with South Korea. What opportunities does Asia present for Kuwait? How do you see cooperation with Asia developing in the future, and in what areas?

Asia is a traditional market for Kuwait and most of our exports are destined towards that region. We have always enjoyed strong relations with Asian countries; for example, Kuwait is already progressing well with a Vietnam's refining and petrochemical complex. We are also in dialogue with our Chinese friends and hope that we can reach a common understanding to enhance cooperation between the two countries. In addition, we are exploring various projects within Asia and we will announce them once they are finalized.

Kuwait has been taking steps to encourage foreign trade and investment. What is being undertaken in this regard? How do you view overseas investment by Kuwait?

As far as investment outside Kuwait is concerned, I am happy with the progress. We already have investments in upstream activities in several countries around the globe which comes in accordance with KPC's 2030 strategy. In the downstream, Kuwait has a share in Europe, as well as Vietnam and China. As for encouraging foreign trade in Kuwait, we are signing contracts with various international

companies to develop the industry and, at the same time, to train and promote staff competencies to be on a par with international standards.

Kuwait has stated that it would like to reach a production target of 4 million barrels/day by 2020. Do you still have this target in mind and what are you doing to achieve it?

The strategic directions call for increasing production capacity inside the State of Kuwait from the current level of 3.2 million b/d to 4m b/d by 2020, and continuing on these levels until the year 2030. After KPC formulated its 2030 Strategic Plan, high level design work of all the strategic initiatives was accomplished. Now, most of our strategic initiatives are currently in the implementation phase.

In this regard, several projects related to building gathering centres, booster stations, as well as drilling development are underway to achieve the set target of 4m b/d by 2020. Moreover, KPC will promote partnerships which will allow for the transfer of technology and technical capabilities, as well as helping in the achievement of growth objectives.

Diversification of the economy has also been a topic of discussion in Kuwait. Although oil will clearly remain the main financial contributor, how do you see diversification evolving? What economic development projects are in the pipeline?

Kuwait is undertaking significant steps towards fulfilling HH the Emir of Kuwait, Sheikh Sabah Al-Ahmad Al-Sabah's vision to transform Kuwait into a regional trade and financial hub for the Gulf through development, diversification and GDP growth. However, Kuwait is faced with challenges in view of its continuous budget surplus.

The current plans, however, will put the country back on track by returning to former successes within trade and financial activities and by expanding in industries like petrochemicals and investments in renewables. The long-term target is to make the private sector the main driver of the economy and to ensure job opportunities and an increased labour force. Furthermore, reform needs to be undertaken to encourage investment in Kuwait.

The country has some big plans for refining. Can you shed more light on this, as well as what the Clean Fuels Project constitutes?

The new refinery is one of the largest strategic projects in the State of Kuwait as its capacity will be around 615,000 b/d. The main objective is to supply power generation plants in Kuwait with environmentally friendly fuel.

The clean fuel project is basically designed to upgrade the Mina Abdulla and Mina Al-Ahmadi refineries to be capable of producing an environmentally friendly fuel. The two projects complement each other and will lead to the processing of high-quality petroleum products that will open new market outlets across the world and enhance their competitive ability in those markets.

Kuwait is planning the first survey of offshore resources in decades. What is the extent of the survey and what do you hope to achieve with it?

In line with the overall KPC 2030 Strategy, we will continue to explore, to add more to Kuwait's existing reservoirs through technological advancement to improve recovery rates, along with seeking out new discoveries. However, the survey is still in its initial stage.

Shale oil and shale gas are the talk of the town these days. What is your country's hope in relation to the development of its own shale resources? Could the country produce enough gas to meet its domestic needs?

Kuwait is a net importer of gas. This is due to growing demand for electricity, which rises by about six to eight per cent each year. The shale resource potential in Kuwait is there. We have been conducting studies into the viability of extracting shale gas from recently identified reserves. The use of state-of-the-art technology, which is available in international oil companies, is crucial for the commercial production of these unconventional reservoirs.

The country has been doing very well financially, posting 14 consecutive budget surpluses. Do you see this positive trend continuing in the coming years?

The budget is directly connected with international price levels which are set by market conditions. In the past few years, oil prices have remained over \$100/b, which have yielded a budget surplus. It is really difficult to forecast the continuation of such a situation in the future, and plans should not be made based on projecting surpluses in the future.

Finally, oil prices have fluctuated somewhat over the past few months. What do you think of current oil prices?

The OPEC Basket price has been stable — slightly above \$100/b on average — since the last meeting in May 2013. Recently, geopolitical factors have pushed prices higher. However, we believe that this will be temporary. OPEC has managed to adequately supply and stabilize the markets. I am happy with the overall markets and price levels so far.



Populating the future oil and gas industry

Talented and innovative people are going to be in great demand in the coming years in the oil industry, but they will face strong competition from other industries and there is likely to be a shortfall in experienced staff after baby boomers retire.

With the petroleum industry in general scrambling to deal with an impending shortage of skilled human resources, it is no surprise the subject was a key point of discussion within many of the panels at the Kuwait

prices dropped to as low as \$8/barrel back then due to several geopolitical issues, which led America to turn its attention to local oil in Alaska and the Gulf of Mexico, as well as greatly increasing its nuclear power generation capacities, he said in an interview with the *OPEC Bulletin*. Due to this crisis, the industry stopped recruiting to try and cut costs, and that action led to today's shortfall of people in this specific age range in the oil industry.

"It was a good solution in the 1980s to make a profit, but actually it hurt the industry in the long term and now we are suffering because of this," he said, adding there is a strong correlation between oil prices and the number of people entering the industry.

Today the human resources graph is imbalanced. "You're going to see a large number of young engineers, who are about 23–29 years old, and you are going to see a large number of those ranging in the 50s and 60s.

"Statistics show that in 2020, 90 per cent of the baby boomers are going to leave our industry, taking their experience with them," and leaving the industry with a large number of less experienced young people. "Unfortunately, the large gap is in the middle-aged people — the 40s and the 50s — that will leave the industry and in a very difficult situation."

He stated that 22,000 experienced professionals will retire in 2014, 17,000 of whom will be replaced by students from graduate schools in the same period. That leaves a gap of 5,000.

"It's not what you see of the iceberg that makes the challenges, it's what you don't see."

There are several solutions to deal with this, said Al-Safran. The competencies of the young 'X' generation can be accelerated so that their talent and experience become relatively much more advanced than their age, or more middle aged people could be hired. "This time is the best time to be a petroleum engineer," he added.

In order to solve this problem, Al-Safran said that academia and the industry are going to have to join hands and help each other. "The last year of senior students should be more of a collaboration between the university and the industry. It should not be purely academic, but more into training, operation, field, as well as classroom experience, so that when they join the industry they are



Eissa Al-Safran, Associate Professor and Vice-Dean at the Kuwait University College of Engineering and Petroleum.

Oil and Gas Show and Conference, with delegates and speakers alike reiterating that the key to the future of the oil industry is the people.

Today's manpower crunch is a result of shortsightedness in the 1980s, according to Eissa Al-Safran, an Associate Professor and Vice-Dean at the Kuwait University College of Engineering and Petroleum. Oil



Ali Al-Jarwan, Chief Executive Officer of Abu Dhabi Marine Operating Company (ADMA-OPCO).

up to speed and can minimize the transition period and join the workforce quickly.”

He would also like to see more professionals from the industry spending some time in the classroom, where their experience is needed. “We don’t have enough faculty ... faculty are leaving and moving to the industry.”

“We have two major objectives ... achieving the expectations of government and shareholders while achieving ... development of resources. We have to be good to manage all these resources,” said Ali Al-Jarwan, Chief Executive Officer of Abu Dhabi Marine Operating Company (ADMA-OPCO), while moderating a session on ‘*Growing our organizational capabilities*’. “Without the talent and the development of the talent it will be very hard to sustain our status and at the same time meet this growth.”

Growing organizational capability is a big part of meeting the Middle East’s agenda, according to Hosnia Hashim of the Kuwait Foreign Petroleum Exploration Company (KUFPEC), co-moderator of the session. “We are doubling production ... and increasing facilities, so how can we as the Middle East cope with that increase?”

“To achieve [Kuwait’s] strategy in this rapidly changing environment, there are many challenges that we are facing as a national oil company,” said Waffa’a Al-Zaabi, Deputy Managing Director, Kuwait Petroleum Cooperation (KPC): The need for technology and skilled talent to develop gas, heavy oil and complex oil reservoirs, rising

costs and time needed to accomplish projects, increasing demand for environmentally friendly refined products, environmental regulations and climate change, finding the expertise to manage increasingly difficult and complex projects, as well as increasing local power demand and meeting social commitment.

“As for the skills and capability of our people, we consider this to be our top priority,” as KPC is working on full integration and optimization of HR systems and developing the processes for identifying and managing talent, she said.

“We are developing our leaders, cooperating with schools and universities to win the next generation of oil sector employees and attract talent.”

John Barry, the Country Chair for Abu Dhabi and Shell’s Vice-President for Abu Dhabi, Syria and Kuwait, added that the talks led him to think about people development aspects, “... and it got me thinking: what can IOCs bring to NOCs in terms of people development, and I think there’s quite a lot we can offer. We can bring some of the tricks and techniques we have developed ourselves.”

Shell spends more than most IOCs on technology, he said, but “the most useful thing we can bring to you is the knowledge that a particular widget or patent worked well in these four reservoirs, but not well in these two. So, I think it’s more about knowhow and being able to share that which builds the trust that makes our partnerships sustainable.

“Developing the human capacity is about more than just working on the people in the company, we’re also trying to get good people in from universities and schools, so our own efforts around the region start quite early.”

Barry spoke to the *OPEC Bulletin* about the Shell eco marathon, in which university students are challenged to build eco-friendly cars. “These cars don’t race to be the fastest, they race to go the furthest on one liter of fuel, and it really unleashes a lot of innovation from the students. It teaches them about teamwork, about project management,” he said, adding that some of the contestants went on to work for the Abu Dhabi National Oil Company (ADNOC).

The industry is going through very challenging technical issues, mainly related to unconventional resources, such as shale gas, tight gas, shale oil and heavy oil, says Al-Safran. “We need to produce more ‘difficult’ oil because we are running out of conventional oil. Sixty per cent of Kuwait’s hydrocarbons in 2030 will be from fields yet to be discovered, with eight per cent of that coming from heavy oil,” he said.



Nansen Saleri, President, QRI Group.



John Barry, Country Chair for Abu Dhabi and Vice-President for Abu Dhabi, Syria and Kuwait for Shell.

These challenges require enough people to be able to develop and implement technology. “Not only enough people, but especially talented people who can really think creatively to be able to solve these problems ... as we speak right now the industry does not have those people.

“They have to be equipped with advanced knowledge, a creative type of thinking so they can solve problems. Unfortunately, the university will not be able to do it ... it is simply a capacity issue.”

More “grey cells per barrel” are going to be needed to extract oil in the future, agreed Barry, adding the days of easy oil are over.

“I was thinking about the emerging challenges. If you look around just this region and see the need to develop sour gas. We see the beginnings of improved oil recovery, but even enhanced oil recovery. We see an aging fleet of assets where integrity issues need to be managed in a smart way. We also see a proliferation of data. How do we deal with that and actually make use of it?

“There are many other examples; the unconventional, the arctic, floating liquid natural gas around the world where, yes, just to get one barrel out of the ground takes a lot more reflection ... there is no danger of no change.”

Another side of the issue is bringing out the innovation in each individual, said Nansen Saleri, President of

QRI Group. “... what we are seeing in the past five years has completely transformed the arena in which we are all playing.” Although the industry is not as competitive or fast as IT, he said, “we are getting there”.

Indicators point to a resurgence of innovative capability in the industry, Saleri added. “Everybody has innovation inside them ... it’s just a matter of creating the environment in which innovation becomes an application, it’s not just a matter for management.

“Here is a question for the companies, how do you bring this innovation out, give it the freedom? What works for a 75-year-old man is not the same thing that works for a 25-year-old PhD holder. The key is giving them the freedom, the flexibility.”

Joining minds

Senior Advisor to Schlumberger, Pierre Bismuth, said that projects are bigger and more complex than ever before and that targets are being missed due to delay and budget problems “because we have not invested enough in building capabilities. So, I hope we will all invest enough to make 2020 easier for us.”

It’s very important to join minds from everywhere, the East, the West and the Middle East, and join also with academia around the world, said Al-Jarwan. Successful



Ala'a Al-Mousawi, Senior Planner and Petroleum Engineer at the Kuwait Oil Company.

organizations that execute new ideas have process and culture. “Innovation is related to people.”

But perhaps the most important element is the human one, according to Bismuth. “What people call knowledge transfer is a human-to-human transfer first. I think we should forget about the knowledge transfer happening by the computer. This is not what the young people want. What the young people want is for the senior people to engage themselves in coaching them, in passing to them

not only the knowledge as such, but also the passion to be in the industry.

He added: “I think that all the seniors should be coaches — all of them. There is no one who can afford to have a seat in the back and not feel responsible for coaching.”

Another element to solving the manpower problem is being sure to include the female component of the workforce, added Al-Safran, an area in which, he said, Kuwait is already quite advanced. He stated that currently in Kuwait the number of males registering for petroleum engineering is 60 per cent, but the number of graduates is 60 per cent female because “girls usually persist.

“Diversity is important in our industry, and their (male and female) talents complement each other.”

Ala'a Al-Mousawi, a Senior Planner and Petroleum Engineer at the Kuwait Oil Company, graduated in 2002 from Kuwait University and sees role models as the most important element to encouraging young people into the field. According to her, Kuwait is a role model in the region for female participation.

“There was an engineer — one woman who participated in firefighting in the oil field — even my father said go and study petroleum engineering, I want you to be like her. She was a huge motivation for Kuwaiti women.

“In my family, for example, I am the first engineer and petroleum engineer. So at my house they saw me and thought, ‘we can also be engineers’. Now I have three of the young generation studying engineering. It is starting a little bit, but still needs more motivation from the government and oil companies.”

Unconventional reservoirs — the producers of tomorrow

Unconventional oil resources require greater technology and cost to extract, but today’s conventional oil reservoirs are declining and the importance of unconventional heavy crude oil will continue to grow.

A session at KOGS entitled ‘*Unconventional challenges and facilities*’ dealt precisely with some of the creative solutions which are being developed to overcome these challenges, particularly as many of them apply to Kuwait.

The world has over three trillion barrels of heavy crude oil reserves — enough to cover the world’s energy needs for the next 100 years, according to Thomas Perschke, from GEA Westfalia Separator Group GmbH, who discussed the desalting of heavy crude oil by using centrifugal technology.

“Such unconventional crudes cannot be handled in the traditional way,” he wrote in his extract. Typical industry techniques have their limitations with oils of lower API



grades and higher viscosities. High-speed centrifuges can manage low-API grades and highly viscous oils, providing excellent quality crude, possibly in a one-stage process, thus lowering the overall cost per barrel and leading to a reduction in the use of chemicals, wash water and electrical consumption to reduce the environmental footprint of extracting such oils.

Crude oil naturally contains contaminants such as water, suspended solids and water-soluble salts. These damage refinery equipment and must be removed before further processing into other products. The dewatering and desalting of crude becomes harder when it has a density of 19° API or greater, as is often the case with heavy crude.

Such centrifuges could also be used in oily water applications, as oil drilling operations can create large quantities of contaminated water. As wells age and oil becomes harder to remove, they also require injections of water or steam to force the oil out, creating even more dirty water. Basically, a separator greatly speeds up sedimentation, which takes much longer when left to occur in tanks.

Centrifugal systems are well-established in many other applications where the specification of crude is much higher. The first trials are underway now in the Middle East region and show that this technology is the best alternative for heavy crude oil treatment to generate dry, low-salt export crude for refineries, concluded Perschke.

Sour crude production

Another topic discussed at the session was the *'Selection process for optimum sour field surface production scenario – Minagish reservoir, Burgan field'*, prepared by employees of the Kuwait Oil Company (KOC).

The Minagish Reservoir in the Greater Burgan Field was discovered in the late 1960s and production has occurred sporadically since then. At issue has been the high hydrogen sulphide (H₂S) content of fluids produced from the field. Due to the high amount of H₂S in relation to existing facilities' capabilities of handling sour crude production, the field has been treated as 'unconventional'.

Several methods have been used to treat the sour fluids produced from the reservoir, but high operating costs made these unattractive and production was shut down completely from 2005 to 2009 because of concern over the high H₂S content of the fluids.

KOC has set production targets for 2020 that would include a new surface development plan for Minagish as part of a full field development plan.

"The Minagish reservoir will have a small but important role in the near future to provide oil production for the State of Kuwait," stated the paper.

Initial brainstorming started at a workshop, which resulted in nine possible scenarios for a production facility, later reduced to seven. An assessment was carried out on approximate cost and risk factors, including development strategy views; health, safety and the environment (HSE); and project schedules. Cost estimates related to facilities were based on Minagish reservoir production profiles.

Afterwards, a ranking exercise was carried out, including ranking criteria. Seven factors were chosen: HSE, cost, development strategy, project schedule, external approvals, established technology, and power. These were then weighted, with HSE receiving a high weighting.

The currently preferred production scheme involves building a new sour service gathering centre (GC) close to Burgan dome. The paper concluded that the choice of a development scheme for the Burgan Minagish reservoir is relatively complex.

"In addition to economic value, issues related to HSE, operability, power availability and external approvals are all important," it maintained.

Although the process of performing a formal ranking proved to be very useful, particularly for the purposes of excluding some options, it should not be used as the sole basis for making development decisions, it added.

Another paper examining fracture characterization and well placement in deep unconventional reservoirs in North Kuwait resulted in a high-resolution 3D structural reservoir model created using data from nearby wells, a pilot hole and a horizontal hole. The model can be integrated with a field model and can be used by geo-steering people, while drilling.

The tight, deep Oxfordian carbonate reservoirs hold good potential for hydrocarbon production through natural fractures in Kuwait, stated the paper, though sustained production has only been found in regions of high natural fracture concentrations.

Thus, "proper fracture characterization of these reservoirs is of prime importance in the exploration and exploitation of these tight reservoirs," according to the paper.

Borehole images are seen as key tools to characterize these fractures.



Collaboration between three pillars of the oil industry

The relationship between national oil companies (NOCs), international oil companies (IOCs) and service companies has evolved a great deal in the past decades and it will continue to take a dedicated commitment by all groups to meet the upcoming challenges facing the industry.

The way Kamel Bennaceur sees it, the big challenges are: talent development, sustainable development of unconventional reservoirs and technical development for frontier resources.

The Vice-President of Technology for Schlumberger and member of a panel on the topic at the Kuwait Oil and Gas Show and Conference said that when one looks at the

will need another trillion. Where will they come from?" To which he answered: "From areas difficult to access."

This will require more collaboration on technology from all three groups in order to bring costs down, he said. "Unconventional is a topic we all need to work on." Rising population and living standards, especially in non-OECD countries, are going to increase the demand for oil, agreed Arnaud Breuillac, President of Middle East Exploration and Production for French IOC Total. "Oil production is expected to plateau by 2020 but 55 million barrels/day need to be put onstream by 2030.

"It must come from further and deeper environments.



Kamel Bennaceur, Vice President Technology, Schlumberger.



Michael Bittar, Senior Director, Technology, Halliburton.

resources that are available today, a bigger part of them are difficult to extract, although the industry has come a long way in terms of technology: "Ten years ago some of the technology we are exploiting today were not even on the radar screen," the upcoming challenges are even greater. "Unconventional resources are a game-changer."

Michael Bittar, Senior Director, Technology, at Halliburton, asked the question: "To date we have consumed one trillion barrels of oil. For the next 30 years we

Collaboration is essential to mitigating costs," as well as to managing safety and efficiency issues, said Breuillac. "Technical costs are a real worry to us. Technology will be essential."

He added that IOCs have much to bring to the table: resource and recovery R&D, as well as knowledge of how to deploy advanced technology. But, he said: "The NOC/IOC line of distinction needs to be reduced if we want a partnership to move forward. NOCs own most of



Ashraf Zeid, Middle East and Russia Caspian Vice President for Reservoir Development Services, Baker Hughes.



Arnaud Breuillac, President Middle East – Exploration and Production, Total.

the reserves ... IOCs can bring worldwide knowledge in diverse positions. The interests must be aligned ... risks can also be minimized.”

Bittar sees universities — which he calls ‘science factories’ — as playing a key role in meeting future demand. “The wheels of innovation start with university.” He grants universities equal weight in a pictogram with three elements: Asset owners (NOCs/IOCs), service companies and universities.

For example, he said, a polymeric resin was developed to glue together planes built from composite. The same resin has been modified to fill a need in the oil and gas industry and is being used to create an impermeable barrier. “It doesn’t have to come from our industry — adaptation can come from other industries.”

Fibre optics? Used to find and plug leaks. “To advance, we need to redefine concepts.”

IOCs are doing more and more research, according to Ashraf Zeid, Middle East and Russia Caspian Vice-President for Reservoir Development Services for Baker Hughes. Centres around the world incorporating both NOCs and IOCs are being used to develop particular technologies for unconventional oil.

“It is not only new technology, but how it is applied,” said Zeid. It has to be on time, on budget and of good quality, he said, adding that resources are shifting to front-end engineering and project management.

Health, safety and environment (HSE) is a “primary risk in our industry,” he maintained. “What are we doing compared to other industries? When you get on an airplane

it’s completely standardized around the globe, all elements. Can we do this in the oil industry?

“We need to set standards in the industry and not have them imposed by outside because of the next disaster.”

To achieve this will require collaborative efforts from NOCs, IOCs and the service industry, he said. It is necessary to work on projects together and “wear the hat of a joint project team.”

NOCs have a lot of experience and are generating innovation by themselves, Ali Al-Jarwan, Chief Executive Officer of the Abu Dhabi Marine Operating Company (ADMA-OPCO), told the *OPEC Bulletin*. The issue is not anymore IOCs helping NOCs, but that better performance and better management of challenges can be gained through partnership, he said. “Partnership from IOCs for benchmarking, transporting the best practices from their locations around the world and also appreciating the local experience and skills offered by the professionals and managers and leaders. So it is really about the collective, integrated strength of IOCs and NOCs.”

The relationship between service companies, NOCs and IOCs hasn’t changed much, said Bennaceur, but between those two groups the business model is changing with time. “We are seeing now NOCs becoming INOCs, going international, and we are seeing NOCs getting more and more involved in technology development.”

IOCs are also working with NOCs outside of frontiers, confirmed Breuillac. “Kuwait is an example with KUPFEC (the Kuwait Foreign Petroleum Exploration Company).”

“The boundary is blurring, which is requiring us to



Ali Al-Shammari, CEO, Kuwait Gulf Oil Company (KGOC).

adapt to this situation and work differently, but ... all these relationships have to be founded on long-term relationships,” said Bennaceur.

“The name of the contract is not important,” said Breuillac. “What is important for us is a long-term partnership. Short-term doesn’t work in our industry; risk management can only be done in a long-term contract,” he said, adding that mutual benefits for both are important.

“It’s a critical time, because we have a very significant generation that’s going to retire in the next five to ten years and we need to bring in new talent. So now is the time,” added Al-Jarwan.

Schlumberger learning centres exist everywhere in the world now, said Bennaceur. “Facilities can and could be shared by both IOCs and NOCs.” Halliburton is in 80 countries around the globe, said Bittar. “We first establish a relationship with the local university. They are our feedstock.” Ali Al-Shammari, Chief Executive Officer of the Kuwait Oil and Gas Company (KOGC), added that manpower remains an issue which could easily be managed when a good relationship is established with IOCs.

The industry is facing other issues: exploration and production projects are becoming more and more expensive and more and more complex, said Bennaceur, adding that the number of megaprojects has increased four times in ten years, but they are suffering more and more. “What we see is a big issue.”

A major and growing concern on this front is cost overruns, said Bennaceur to the *OPEC Bulletin*, adding that an analysis by Schlumberger examined major projects and the number of those with significant increases in expenses compared to the initial budget. “Projects beyond \$1 billion have grown significantly ... a concerning trend is that 30 per cent of projects have cost overruns that are more than 50 per cent.

“This analysis ... also looked at the major cause of that, and what we see is that the major cause is either people or the technology challenge. These two represent 50 per cent of the challenges.

“... everyone needs to be contributing to this technology development. Of course, there will always be competition, but there is also significant room for collaboration.”

Collaboration has already been very successful at solving problems. NOCs and IOCs worked together to create a capping technique after the Macondo oil spill, said Bennaceur. “Now we have a system in different regions of the world in case of a mishap to kill a well within a short period.”

Al-Shammari said Kuwait has seen tremendous value-added results because of joint agreements. He talked about a joint-venture steam injection project between KOGC and Chevron in the neutral zone, which will hopefully be on track in 2016.

Research over the past few years has proven that the recovery factor of the reservoir could go in two years from 16 to 60 per cent, making it the biggest heavy oil limestone project in the world. Joint studies have encouraged KOGC to go on to the next stage of development — \$3bn and 400 wells.


“I think all three must join forces with regard to communication to better the contribution of the industry to the world economy,” said Breuillac, adding that it is also necessary to reduce the industry’s footprint. “If we want to be able to have access, we need to be more acceptable.”

The benefits of IOCs, NOCs and service providers working together are immense, added Bennaceur. “The average recovery rate is 35 per cent. If we increase that by just one per cent, we can increase the number of production years significantly.

“Mature fields are quite complex. We need to work as a medical team; we need to understand why something is not working, have the technology and apply the technology.

“Our industry depends on three G’s: growing, global ... and greying,” said Al-Jarwan.

“So with maximum collaboration between all these around the world, including service companies, contractors, IOCs, NOCs, we’ll have a much better blend. The more diverse the formula is the better the result it will give.

“I think also a lot of challenges require strategies and require leadership. So the responsibility shouldered by the leadership (people) at all levels is the way forward. This is not a one-man show,” he added. 

Improvements sought for movement of goods and people in the GCC

The Gulf Cooperation Council (GCC) countries — made up of OPEC Members Kuwait, Qatar, Saudi Arabia and United Arab Emirates, in addition to Oman and Bahrain — have more conventional hydrocarbon reserves than anywhere else in the world. However, barriers to business in the region can be both costly and frustrating, according to operators.

A panel session at the Kuwait Oil and Gas Show and Conference focused specifically on this subject to explore

of 1–10, we are probably at a five in terms of where we need to be in integration,” he said in an interview with the *OPEC Bulletin*. “There’s a lot more work to be done on integration and improving the way goods and services cross borders.”

Glen Sansom, Vice-President of Shared Services for Schlumberger, worked in Europe before moving to the Gulf region. He said in the session that he would place the GCC number even lower, although he clarified that,



Billy-Dean Gibson, Schlumberger.



Glen Sansom, Vice-President of Shared Services for Schlumberger.



Tarek Sultan, Chairman and Managing Director of Agility.

the hurdles in place and attempt to understand how and why they exist, to debate the issues around movement of personnel and goods in the region and to identify possible solutions to the problems.

“Based on all the panelists’ comments, it is obvious that there is room for improvement in the GCC countries in terms of more efficient use of resources, but it is only through frank discussion and open dialogue that this region will move in the direction of easier movement of people and equipment across the borders ...” said panel moderator, Billy-Dean Gibson, an employee of Schlumberger, after the debate.

“When it comes to doing business in the emerging markets there are always challenges. When it comes to supply chain issues, I think the GCC is no different than many other emerging economies,” said Tarek Sultan, Chairman and Managing Director of Agility, and a panel member.

“As far as the GCC is concerned, I think on a scale

in his experience, movement of equipment is much more difficult than that of personnel. Easing border crossings and having a unified approach at border crossings would make a huge difference, he added.

“One big thing for us is moving quite expensive equipment across the border, which we try to share and make the best use of,” said Sansom. There is an existing guideline and agreement in place among GCC countries which states that import duty need only be paid once and a piece of equipment should be able to be imported into any other GCC country without having to pay that import duty again.

“In reality it does not work,” said Sansom. “It takes a lot of time to get the paperwork sorted for that and time is usually of the essence in oil work when you need to get the equipment, so the easiest thing is just to pay another five per cent duty. We have equipment that’s in the GCC for five years and sometimes we’ve paid multiple times duty, even up to its complete value.”

The GCC has a long way to go to get anywhere near where Europe is with open borders, he said.

“For instance, we had an operation in the Black Sea,” he said, a complex deep-water, frontier exploration. “We had to go across 14 borders to get equipment there. Transit time, trucking time was five days, and it took 5.5 days to get there. This is the sort of ease of movement you can have in Europe.” In comparison, to move equipment between GCC countries over maybe three to four borders with a much shorter transit time would take weeks.

More flexibility

Jay Ibrahim, Managing Director of WorleyParsons, said he would like to see more flexibility regarding transfer of people within the region. He said it now takes an average of 120–150 days to get a transfer in place, due to bureaucracy, approval time and nationality.

“It makes it hard on the companies and also on the individual. It hurts some of the added value some folks would like to bring to the region,” he said.

Who pays in the end? “The service companies pay the initial costs, but they end up having to pass that on to the operators,” said Gibson, adding that easier movement of resources throughout the GCC region would mean higher utilization of people and equipment, which would translate into a lower price per unit of work performed.

“What we can say is that in many other parts of the world the service industry gets better utilization of its people and equipment in terms of jobs per day ...”

The GCC is still relatively new in relation to other regional organizations, added Sheikh Nawaf Saud Nasir Al-Sabah, Chief Executive Officer of the Kuwait Foreign Petroleum Exploration Company (KUFPEC) and panel moderator. “It started in the 1980s and faced its biggest crisis in the 1990s with the Iraqi invasion of Kuwait.

“We still face a number of challenges and the GCC is working very hard to alleviate them. One of them is a customs union ... now that’s been implemented within the GCC, but there’s still challenges facing movement of workers, movement of equipment within the region ... moving them efficiently within the region,” he told the *OPEC Bulletin*, adding that there is now full free movement of GCC nationals among GCC countries.

“I am confident the GCC can work together to alleviate those issues for the benefit of all the GCC countries together, because as a group we would be one of the largest economies in the world,” he maintained.

Sultan added: “The reality of the situation is that it is

impacting competitiveness. It is also costing the countries on GDP growth anywhere from five to ten per cent if you read the research from the World Economic Forum.”

Historically there was a certain amount of advantage to protectionism, he said during the panel discussion, but today competition is taking place at the level of the consumer. “Nobody benefits from these barriers.”

It is quite significant that GDP can be so strongly affected just by virtue of moving goods and services more efficiently across borders, added Al-Sabah. “That creates a lot of jobs, that creates a lot of revenue for the states and it creates a brighter future.”

Sultan sees one solution in developing a single body that is responsible on a country-by-country basis for supply chain issues. “[In] any individual country, there are many levels of ministries and stakeholders involved in supply chain issues ... we really need to have a body that is a supply chain regulator in each and every Gulf country and we need to have a regional supply chain body that discusses these issues and tackles them as we move forward.”

He added that he does not feel there is a conscious decision to be protectionist



Jay Ibrahim, Managing Director of Worley Parsons.



Sheikh Nawaf Saud Nasir Al-Sabah, Chief Executive Officer, Kuwait Foreign Petroleum Exploration Company (KUFPEC).

today, but rather that countries are simply not organized enough; there is no basis for ministries to have a discussion on the supply chain. “They just don’t have the ability to have a dialogue.”

One good, practical and specific recommendation made during the panel session was that GCC import departments should move towards a common electronic system and away from paper, stated Gibson. This would make it quicker and easier for border officials to check online for documentation that a piece of equipment has all the appropriate regional duties and fees paid.

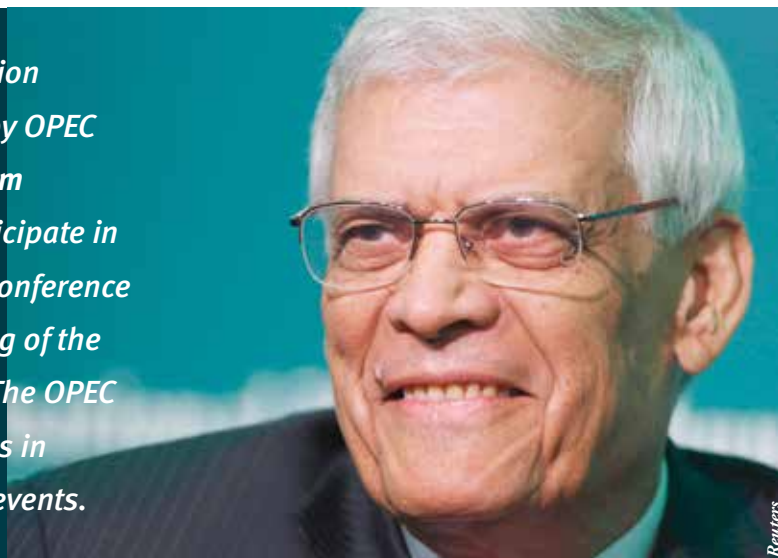
However, he said: “The overall consensus on the panel was that the important first step needs to be for the governments of GCC countries to assign and empower the right level of persons to get together, listen to the challenges and concerns of the oil and gas industry, allow for an open and frank dialogue, then draft policies and agreements that will improve regional cooperation in a way that also protects and benefits each country individually.”

The governments have been working together, added Al-Sabah. “I think it is incumbent upon us as companies working in the oil sector to highlight the issues that we face so that the governments can focus on them and continue to alleviate these concerns.”



Evolving Russian relations

At the end of October, a delegation from the OPEC Secretariat, led by OPEC Secretary General, Abdalla Salem El-Badri, was in Moscow to participate in the International Energy Week conference and the latest high-level meeting of the OPEC-Russia Energy Dialogue. The OPEC Bulletin's James Griffin, who was in attendance, reports on the two events.



Moscow at the end of October and the expectations were for freezing conditions. However, despite some initial rain, the weather proved almost balmy. On October 29, Moscow's main weather station recorded a temperature of 14.9° Celsius, which was the highest for this day on record. In fact, October also ended up the warmest on record in Moscow, with an average temperature of over 9° C. The warmth offered up a perfect backdrop to events in Moscow, as OPEC and the Russian Federation looked to further their dialogue and cordial relations.

The first event on the agenda was the 8th International Energy Week at Moscow's World Trade Centre. Speaking in the first session, co-moderated by Nikolay Laverov, Academician and Member of the Presidium of the RAS, and Georgiy Petrov, Vice-President, Chamber of Commerce and Industry of the Russian Federation, was OPEC Secretary General, Abdalla Salem El-Badri.

Speaking on the global energy outlook, he initially underscored the importance of the conference in promoting energy dialogue among all stakeholders if the industry is to meet the many challenges facing it in the future. It was a theme that would be reiterated throughout the Moscow trip.

All energy sources needed

The significance of this was further underscored in El-Badri's initial comment on OPEC's 2013 World Oil Outlook (WOO), in which he stated that world energy demand is expected to rise by 52 per cent over the period between 2010 and 2035. It was clear from his statement that all energy sources would be needed and that all stakeholders should look to work together to develop a sustainable energy future.

He said renewables hold promise and would see significant growth, albeit from a low base and biofuels and nuclear would also contribute to the world's long-term energy future.

However, he said: "It is clear that fossil fuels will continue to play the dominant role in meeting demand, although their overall share will fall from 82 to 80 per cent. Throughout most of this period, oil will remain the energy source with the largest share, although its overall share declines from 33 per cent to 27 per cent. Coal's share remains relatively stable at around 27 per cent. The share of natural gas, however, is expected to rise from 22 per cent to 26 per cent."

Focusing specifically on oil, he said OPEC's latest projections see demand increasing by around 20 million barrels/day during the period to 2035. The main driver, he stressed, would be developing countries, particularly those in Asia, with the transportation sector the main source of growth.

He was in no doubt that "the industry is capable of meeting the big demand increases, through its huge resource base, underlining United States Geological Survey estimates of the world's ultimately recoverable resources of crude oil and natural gas liquids of more than 3.8 trillion b, as well as recent tight oil developments in North America.

In regard to the latter, he said that "this is welcome

news — it adds depth to global supply, aids market stability and provides further proof that the world is not running out of oil.” However, he added: “Questions remain over how sustainable this will be in the long term.”

Order and stability

Taking all this into account, the OPEC Secretary General stated that “it is clear that the market outlook is a favourable one for the oil industry. And it is up to all of us to ensure that this works out in practice.”

In reference to this, he said that “what the oil market needs most of all, as it seeks to meet the rising levels of demand with the necessary investments, are order and stability. This means a clear vision of the way ahead, together with a cooperative and harmonious approach from all the leading players.”

Nonetheless, he added, “the future path for the industry is marked with uncertainties,” and these can have significant impacts on investment in future capacity to meet the rising levels of demand. He stressed the importance of having “a clear idea of where the market is heading.”

El-Badri underlined that OPEC is committed to invest and to ensure that consumers receive their oil when they need it, which, in turn, supports oil market stability and sound world economic growth.

According to the latest list of upstream projects in the OPEC Secretariat’s database, he said, “Member Countries are undertaking, or planning, around 120 development projects during the five-year period between 2013 and 2017. This translates into average annual upstream investment requirements of around \$35–40 billion.”

The importance of stability in the world oil market, as well as its importance for investments, was also noted by José Maria Botelho de Vasconcelos, Angola’s Minister of Petroleum.

Vasconcelos was also speaking in the first session and went on to emphasize that Angola is making investments to increase its upstream production capacity, which is forecast to be 2m b/d in 2015, as well as undertaking refinery capacity additions.

El-Badri highlighted, however, that it was important to recognize that there are a number of uncertainties that the industry needs to address in the years ahead. He mentioned the prospects for the global economy, particularly in the short and medium terms, although OPEC expected higher global economic growth in 2014, compared to 2013; remaining concerns about the role of financial

markets; the ongoing United Nations climate change negotiations, with their final outcome and impact on the energy sector still unclear; discriminatory energy policies; geopolitics; advances in technology; and the industry’s rising costs.

Dialogue and cooperation

There is clearly much for all stakeholders to discuss, digest and act upon in the coming years, a fact that led both El-Badri and Vasconcelos back to the issue of dialogue and cooperation.

El-Badri drew attention to OPEC’s WOO and his hope that it will make a useful contribution to the industry in terms of a better understanding of some of the challenges, as well as the opportunities, faced today. He said it is vital that “we all continue to consider and discuss our possible energy futures,” and in this regard, “dialogue between all industry stakeholders is essential.”

Vasconcelos stressed that the need for dialogue between all stakeholders — at both regional and global levels — to try and develop a common approach to energy issues.


This was evident in some of the other events attended by Vasconcelos whilst he was in Moscow. According to a press release from the Angolan Embassy to the Russian Federation, he also attended a roundtable on ‘Cooperation between the Russian Federation and African countries in the domain of energy’, at the invitation of the Chamber of Commerce and Industry of the Russian Federation, and paid courtesy visits to the Russian Federation’s Minister of Natural Resources and Ecology and to the Deputy President of the Angola-Russia Intergovernmental Commission.

El-Badri was also busy enhancing dialogue and cooperation after his session at the International Energy Week. Following a meeting between experts from both the Russian Federation and OPEC, who made presentations and exchanged views on various energy and oil-related topics, he met with Alexander Novak, Minister of Energy of the Russian Federation, as part of the ongoing OPEC-Russia Energy Dialogue. The high-level meeting was also attended by a delegation from the Russian Federation and officials from the OPEC Secretariat.

Inputs to this came from the earlier experts’ meeting, which discussed short-term oil market developments and prospects, with much focus on the global economic situation, world oil supply and demand levels and stock movements, as well as the medium- to long-term upstream and downstream oil outlooks, including the associated uncertainties, challenges and opportunities.

In addition, the experts discussed the status and recent developments of shale gas and tight oil. This included such issues as their contribution to the global energy mix, their investment costs, the decline rates for wells and their long-term sustainability, the differences in regulations and policies in various countries, as well as the environmental impacts of extracting these resources.

The meeting follows on from the successful high-level meeting of the OPEC-Russia Energy Dialogue that took place at the OPEC Secretariat in Vienna, Austria, in September 2012. The two parties agreed to continue their collaborative efforts and to have their next high-level meeting in Vienna in the second half of 2014.

It may have been a short visit to Moscow, but like the weather, the meetings had been warm. The conference had provided OPEC with a means to underscore its views on the global energy future and the Energy Dialogue enabled both OPEC and the Russian Federation to further their cooperation. 

Oil & Money

Conference assesses impact of tight oil



Abdalla Salem El-Badri, OPEC Secretary General, speaking at the Conference.

Unconventional petroleum – the much vaunted tight oil and shale gas – and prospects for their future development was very much a topic of discussion at this year’s Oil & Money conference, held in London in early October. In fact the theme of the 2013 two-day annual event, hosted as always by Energy Intelligence and the International Herald Tribune, was ‘A Revolution in Progress’, in keeping with the shale revolution that has taken the United States by storm over the past couple of years and now being assessed by numerous other countries the world over.

Even though participants at this year's prestigious *Oil & Money* conference were in little doubt as to the immediate success and fortunes shale oil and gas have brought to the United States energy scene, with the nation's crude oil exports falling month by month as a result of the 'revolution', the general picture for this new form of unconventional oil was anything but clear.

There was a general feeling among speakers that while shale developments would eventually happen elsewhere, it would take time and developments in the US would unlikely be replicated.

It was pointed out that other countries wishing to tap into the same level of success as the US were coming up against a number of obstacles, including the absence of the basic geology required for their exploitation, problematic legal and property rights, a lack of appropriate drilling technology and pipeline infrastructure, high population densities, and the environmental impacts from shale drilling.

Whereas the US shale revolution had been achieved in just seven or eight years, due to the ideal conditions offered by the country's particularly endearing characteristics, it was felt that with all the barriers that needed to be removed, it could take several decades before some other countries would be in a position to develop shale plays and the associated technologies.

Tight oil welcomed

The question was also posed that shale oil and gas posed a problem for OPEC's conventional producers, but this was quickly refuted by participants who actually welcomed the advent of tight oil, pointing out that with future global oil demand set to increase in the years ahead, particularly in Asia, all available energy sources would be required.

The future of shale gas and tight oil developments in North America and other regions was discussed in the conference's first session, which featured four prominent speakers, backed by many years of experience in the petroleum industry.

Abdulla Bin Hamad Al Attiyah, the former long-serving

Energy and Industry Minister of Qatar, was joined by Dr Youcef Yousfi, Algeria's Minister of Energy and Mines, Abdalla Salem El-Badri, OPEC Secretary General, and Fatih Birol, Chief Economist at the International Energy Agency (IEA).

Game-changing developments

In introducing the panel members, session moderator, Nordine Ait-Laoussine, President of the Geneva-based energy consulting firm, Nalcosa SA, set the scene by saying that "today we live in a world of perpetual change, in which new events, new developments and new crises, have become the new normality. The frequency with which these game-changing developments succeed and even overlap each other is staggering."

Al Attiyah, who is now President of Qatar's Administrative Control and Transparency Authority, told the audience that he was aware that some producers in the industry were concerned about the rise of shale gas and how it might destroy their market and their long-term index to oil.

"But I have another theory. I consider that shale gas is an added value to conventional gas. A few years ago, people were worried there was not enough gas and everyone was looking for new sources.

"So I feel that shale gas will give more trust and certainty to gas producers — assure them that there will be sufficient long-term supplies, perhaps for more than 200 or 300 years of supply," he affirmed.

Al Attiyah said shale gas would be another competitive fuel in the overall mix.

Concerning its rise in the US, he said it was interesting to note that before the shale revolution, some 50–60 per cent of power generation in the nation came from coal.

"Now they are substituting it with gas, which will be playing a big role. It is also interesting to see the US now exporting its coal to countries like Germany.

"The shale gas in the US will go to the power sector, to the production of chemicals and to fertilizers. And don't forget that the Middle East needs more gas supplies.

"So I am not concerned about shale gas — both that



First session panel members comprised (l-r): Abdulla Bin Hamad Al Attiyah, the former long-serving Energy and Industry Minister of Qatar, now President of Qatar's Administrative Control and Transparency Authority; Abdalla Salem El-Badri, OPEC Secretary General; Dr Youcef Yousfi, Algeria's Minister of Energy and Mines; and Fatih Birol, Chief Economist at the International Energy Agency (IEA). Far right is session moderator, Nordine Ait-Laoussine, President, Nalcosa SA.

and conventional gas can play the same role. Shale gas will also offer solutions to certain oil product shortages in the years ahead," he added.

Algeria's Yousfi told delegates that of the many changes that had been witnessed in the oil industry over the past ten years, from the upstream production side, the most significant development was the exploitation of tight oil and shale gas, although he did not believe it would cause problems for OPEC in the future.

Two other major areas of change had been the global economic picture and the technological improvements witnessed in the energy sector.

There had been improvements on the demand side with energy efficiency and energy conservation. "We see many countries are reducing their consumption."

Upstream, in exploration, there had been a lot of improvements concerning deepwater exploration and the new pre-salt areas in Africa and other regions.

Yousfi stressed that medium and long-term demand for oil would increase. He also pointed out that OPEC had, in the past, shown great resilience and it continued to hold the majority of the world's proven crude oil reserves.

Speaking also on the sidelines of the conference, the Minister told reporters that his country expected to double its gas production in the next seven to ten years after making a number of significant oil and gas finds in maturing and new fields.

The country had also pinpointed around one billion barrels of oil under its Hassi R'mel field and made oil and gas finds in the Berkine and Illiza basins.

Algeria had also made progress in evaluating the potential for its unconventional oil sources with studies finding 300–500 trillion cubic feet of tight oil and more than 700 tcf of shale gas domestically.

Also speaking on tight oil and shale gas, OPEC's El-Badri maintained that

tight oil should be viewed as a new liquid and "we should welcome it." He did not see its presence causing much trouble for OPEC.

He said OPEC estimates suggested that tight oil in North America alone (including NGLs) could reach close to a production of five million barrels/day by 2018, before witnessing a decline.

He highlighted that the world needed to see just how sustainable tight oil developments were in the longer-term, particularly in view of the fact that decline rates of up to 60 per cent were being witnessed at some wells after just one year of production.

El-Badri also underscored the marginal cost of many such wells. If oil prices "fall to \$60, \$70 (a barrel)," much of the tight oil would be out of the market completely.

The OPEC Secretary General's view that there was plenty of room in the market for both the Organization's output and tight oil was shared by many others at the conference.

His comments were backed by the IEA's Birol, who stated that he did not think that what was happening with shale oil and gas in the US was a life-threatening development for OPEC.

In the years ahead, the Middle East would continue to be the heart of global oil supply," he maintained.

The next few years, he said, would continue to see



growth in US shale oil, which was very good news for the US and the rest of the world. But he said he did not think this had either the resource base or the economics to replace Middle East oil.

In characterizing the oil revolution, Birol said that, over the past few years, the script of the main energy actors had been rewritten.

Drivers changing the script

“Major energy importers are now becoming energy exporters. Major energy exporters are becoming major energy consumers — as in the Middle East — and small energy consumers are becoming key energy consumers, such as the countries in Southeast Asia,” he professed.

Birol said three drivers were effectively changing the script — the shale gas revolution in the US; the light tight oil revolution, which was a bit different to shale gas in terms of the resource base and the economics involved; and the energy efficiency policies of the consuming and exporting countries.

A second panel discussion was also dedicated to the subject, with participants looking at the prospects for non-conventional oil and gas outside North America and whether the oft referred to “game changer” could expand to other parts of the world in this decade.

Session moderator, Andre Gould, Chairman of the BG Group, highlighted the fact that the US had many unique characteristics in this regard — US mineral rights for landowners, availability of infrastructure and US data availability, which was much better than elsewhere.

Apart from unconventional oil, this year’s Oil & Money Conference also looked at the global short- and medium-term oil market outlook; the prospects for onshore and offshore oil and gas exploration and production, including successes in Africa; the new world of oil and natural gas trading and the outlook for regional gas markets.

On the second day, delegates discussed the economic and financial situation post 2008; emerging national oil companies and indigenous upstream firms in the Middle East; prospects for the refining industry in North America, Europe and Asia; and the possibility and implications of US energy independence.

Keynote speakers included Dr Abdel Bari Ali Al-Arousi, Libya’s Minister of Oil and Gas, who concentrated his comments on Libya’s domestic situation. He told delegates that the country’s oil and gas resources — the most important pillar of Libya’s economy — were vital to rehabilitating and advancing the country’s economy.

“We believe Libya will overcome the challenges it currently faces and return to full production soon,” he stressed. *(See report on his address on page 44).*

Another keynote speaker was Total Chief Executive, Christophe de Margerie, who, in looking at global petroleum requirements, said the world needed to add 55m b/d of oil production between now and 2030.

He based his calculations on annual decline rates of 4.5 per cent at producing fields and 0.6 per cent annual growth in demand.

But de Margerie said he was concerned about the current high level of industry costs which were affecting the number of upstream projects being implemented. He added that the main problem facing oil companies today was not a lack of reserves, but rising taxes and other costs.

Meanwhile, his counterpart at Royal Dutch Shell, Peter Voser, who won the Petroleum Executive Award for 2103, said in his keynote speech that it was clear the future would bring enormous opportunities and challenges, as global energy demand surged.

“So, today I will stress the need to persevere and to continue investing in new supplies, in new technology and in our people. None of this is easy, or cheap, but we must remember it could bring enormous benefits over the long term.”

Voser added: “Our industry should retain the courage and foresight to explore new opportunities and markets. I am talking about opportunities that could blossom in 20 or 30 years’ time.”

The Oil & Money Conference is regarded as one of the energy industry’s premier events of its kind. Since its inauguration in 1980, it has attracted significant senior executives from the petroleum and natural gas industry across the globe and continues to set the standard for candid, high-level discussion and debate on the issues of the day. Each year, the event attracts well over 500 high-level officials from more than 40 countries.

Libya has tremendous potential for development

— Al-Arousi

Libya has tremendous scope for development and investment in the petroleum sector is vital for increasing the domestic production and reserves potential for rehabilitating and enhancing the welfare of the country.

That was the view of Libya's Minister of Oil and Gas, Dr Abdel Bari Ali Al-Arousi, at the Oil & Money Conference, held in London in early October.

In a keynote speech to the annual oil industry gathering, he pointed out that the country depended on its oil and gas resources, which he referred to as "the most important pillar of Libya's national income and economy."

Giving an overview of Libya's current challenges, he told delegates: "We are facing the challenges of formulating and implementing medium- and long-term development plans in the petroleum sector, including revamping oilfield infrastructure.

Back to full potential soon

"However, we believe that Libya will overcome these challenges and bring back its full potential soon."

Reflecting on the country's civil strife, Al-Arousi stated that following Libya's liberation, the government focused immediately on implementing maintenance and repair operations on damaged oil and gas fields, refineries and factories to bring them back into operation.

As a result, oil production resumed gradually until it reached more than one million barrels/day by the end of 2011.

"This level of production was accomplished very quickly, due to the tremendous efforts of the national oil workers, combined with their experience and prominent availability on different oil sites, despite the harsh conditions and the lack of equipment," he affirmed.

The Minister said that oil production continued to rise

to reach almost 1.6m b/d in mid-2012, which was close to the level before liberation.

"This success in achieving such a high production level was astonishing and not at all expected by analysts in the industry worldwide," he noted.

Al-Arousi said the government's current plan in the domestic petroleum sector was to develop and improve the performance and to put mechanisms in place for protecting the current production ceiling of both oil and gas production.

"We are working to increase production through developing the producing fields and to achieve new exploration discoveries," he said, adding that this was despite the current circumstances regarding the shutdown of production in some fields because of strikes.

He stressed that efforts were being made to bring oilfields back to normal production. As a result, production from some fields began in September. "Now we are producing almost 700,000 b/d of crude."

The Minister said the government plan also included a review and update of the Libyan oil law.

"In this respect, we have formed a committee of experts to study and review the oil legislation and propose a legislative basis to regulate the exploration of oil wealth to encourage outside investors.

"This committee will also review existing contracts to reach the best options and ensure the rights of the Libyan people, as well as encourage foreign partners to work in Libya," he said.

Al-Arousi said that within the framework of the country's fight against corruption, the government had also established a committee to prepare the foundations for supporting and enhancing integrity and transparency within the oil and gas sector.

"We are preparing a plan for new graduates and



Libya's Minister of Oil and Gas, Dr Abdel Bari Ali Al-Arousi, addressing delegates at the Oil & Money Conference.

junior staff for intensive training courses in the areas of the English language and computer applications, to help in the placement process for working in the oil companies after completing their training period," he disclosed.

"We are also coordinating training courses with some international institutions. This entails a number of young people in various disciplines related to the oil industry, with a view to taking leadership positions. In addition, we have extended and opened new offices in some cities to facilitate services and procedures in the oil business."

Manufacturing committee formed

Al-Arousi said that as part of ongoing developments, a national corporation for oil refining and manufacturing had been established. In addition, a new manufacturing committee had been formed to review existing capabilities and establish a new master plan.

"Our biggest challenge right now is to bring back the

production in Libya to 1.6m b/d, and we are planning to increase it afterwards to 2m b/d to enable us to proceed with our plans," he contended.

In answering questions after his address, the Minister said the government expected to solve its current problems soon and bring production back up to 1.6m b/d.

He reiterated that the committee of experts which had been set up to look at all previous oil agreements would seek to come up with new accords offering better terms and conditions. "We think we have come up with something that is good for both sides."

Regarding the new oil law, he stated: "We have been working on the new petroleum law since the beginning of this year and we are now almost finished. Experts from different fields have been working on this. We have had some workshops and we expect, at the end of this year, we will issue a new law."

Asked about possible new exploration rounds being announced, Al-Arousi said that hopefully these would come next year, once the review of existing contracts was completed.



El-Badri addresses Oman Energy Forum on oil market situation

OPEC Member Countries must remain vigilant going into 2014



*Abdalla Salem El-Badri,
OPEC Secretary General.*

Despite a balanced oil market with crude supply amply meeting demand, OPEC and its Member Countries need to remain vigilant going into 2014 to face continuing challenges, according to the Organization's Secretary General, Abdalla Salem El-Badri.

Addressing the Gulf Intelligence Oman Energy Forum in Muscat, in October, he warned that there remained many concerns for the market to digest — and act upon.

El-Badri said that while some might suggest that the past year had been less volatile than those in the recent past, it remained a testing time for the global oil industry.

"In 2013, we have continued to see a number of uncertainties and challenges. These include the future of the global economy as it continues its recovery, geopolitical events and

their potential and actual implications on the oil market, as well as some supply issues, particularly in North Africa and the Middle East," he pointed out.

The major worry today, he told delegates in a keynote speech, continued to be the global economy, particularly in the short and medium term.

Giving a brief overview of the current situation, El-Badri noted that in the United States, they continued to see some economic recovery, with improvements in the labour market, the housing market and stronger numbers for manufacturing and services, as well as improved consumer confidence.

"And I am sure we are all happy to see the US government step back from the brink of defaulting on its debt. We anticipate seeing stronger US growth in 2014 — at 2.5 per cent, better than the 1.6 per cent expected this year."

In Japan, while the country continued to enjoy government-led support measures, there remained challenges for the government in its ongoing recovery and fiscal consolidation efforts, he said.

The Eurozone continued to be a region of mixed messages. El-Badri noted that there had been some improvement in output and sentiment, but the labour market situation remained a major challenge, particularly in places like Greece, Spain and Portugal.

"However, as the economy is coming from very low levels of output, there is some expectation of a slight recovery later this year and into 2014," he observed.

In China, he said, recent data suggested that the economy had slowed a little. The country's economic growth for 2013 had slipped from a predicted eight per cent at the start of the year, to 7.6 per cent today.

"Although I should stress that this figure is still clearly positive. India too has seen its predicted growth lowered, and this now stands at five per cent for this year. We hope that this slowdown is just a short-term issue, and not a long-term trend."

El-Badri said that in developing countries, in general, there had been some concerns regarding the impact on their economies of the expectation of a reduced US monetary stimulus, which would affect the inflows of investment and accordingly reduce demand for their exports.

“However, we expect growth to remain fairly robust in the developing world,” he affirmed.

“There is clearly much to keep policymakers engaged as countries and regions look to stimulate and support economic recovery.”

The OPEC Secretary General said that, overall, the outlook for 2014 was better than for 2013. OPEC’s *Monthly Oil Market Report* saw global GDP growth of 2.9 per cent in 2013, increasing to 3.5 per cent next year.

In terms of other challenges, he reiterated the importance of eliminating excessive speculation in the marketplace.

Many factors at play

Over the past few years, he said, the oil market had not been directed solely by the fundamentals of supply, demand and stocks, as it had been in the past. There were many other factors at play, such as the role of oil as an asset class, speculation, the futures market and spot prices, and, of course, the current economic environment.

“I am sure everyone here can appreciate that we cannot avoid speculation and volatility altogether. It is a part of the market. However, it is essential that we look to mitigate extreme volatility and excessive speculation, which are detrimental.”

El-Badri explained that trading continued to be made on the perception of a supply shortage, rather than evidence of any actual or impending shortfall.

“Even though this year — in terms of prices — we have generally witnessed prices move in the \$100-\$110/barrel range; a range that is acceptable to producers and consumers alike. It is important that prices do not witness extremes — neither too high nor too low,” he stressed.

On the supply side, El-Badri noted that there had been some disruptions in a number of producing countries in the Middle East and North Africa, as well as in the North Sea.

These developments, however, had had minimal impact on the market. Supply had been able to meet demand. In addition, supply continued to increase with non-OPEC output expected to rise by 1.1 million b/d in 2013, and 1.2m b/d in 2014.

Non-OPEC supply increases were being led by the US and its rising tight oil production.

“Let me stress here that this is a welcome development. It adds depth to global supply, aids market stability and provides further proof to consumers that the world

is not running out of oil. We hear very little talk of ‘peak oil’ today,” he said.

However, El-Badri said that while recent developments in the US had been transformative for its energy industry, one needed to see how sustainable this type of production was in the longer term.

“For instance, tight oil wells in the first year witness steep decline rates. It means that operators need to ‘drill, drill, drill’ just to maintain production,” he pointed out.

In terms of OPEC crude production, he said it was currently at just over 30m b/d. The Organization was making sure its consumers’ needs were being met.

At the same time, spare production capacity remained at comfortable levels. “And we see these comfortable levels remaining for the foreseeable future.”

From the perspective of stocks, El-Badri said they also saw fairly robust numbers. Stock levels in the OECD remained relatively healthy and there had also been a steady build up in commercial and strategic petroleum reserve stocks in non-OECD regions, such as China and India. And forward demand cover was currently at 58.6 days, which was above the five-year average.

He said that given that world demand growth was forecast to increase by 800,000 b/d in 2013 and by 1m b/d in 2014, there was clearly enough supply to meet rising demand.


Before his comments on the oil market, the OPEC Secretary General offered significant praise for Oman.

He said that, over the years, the country had been an important part of the international oil and energy markets. In terms of oil, its current production stood at around 900,000 b/d and the country planned to invest even more to help boost reserves and capacity further.

“It is proving an excellent example of how you can get much more from natural resources by using technology for enhanced oil recovery. Moreover, Oman has also seen increasing investments in the downstream, as well as in storage, trading and shipping, and it has major plans to expand its natural gas sector,” he added.

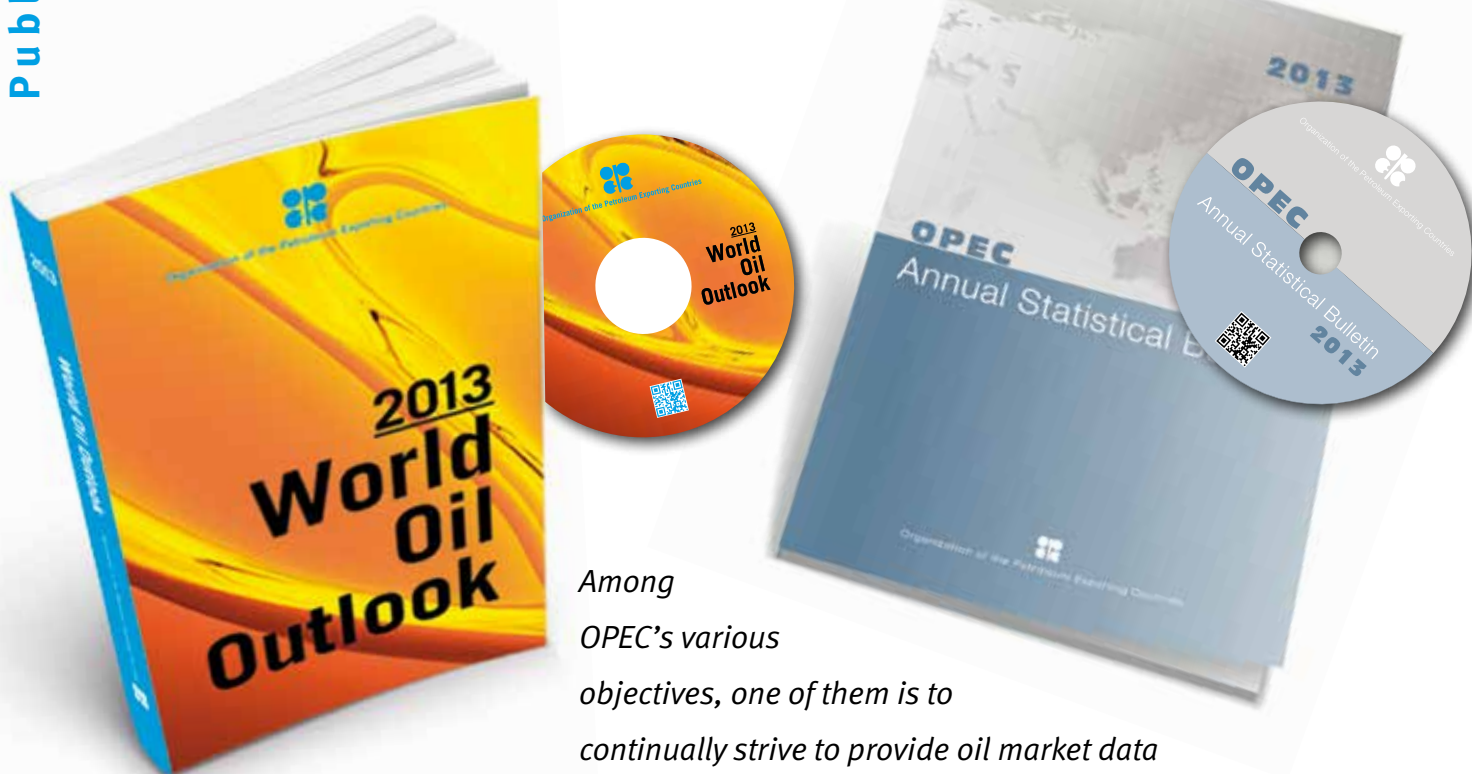
El-Badri pointed out that the country had decided to take some risks and invest considerable resources to expand its oil and gas capabilities.

“This is something OPEC welcomes. It is clear that Oman is now reaping the rewards from recent developments,” he stated.

Given its location at the crossroads of the energy corridor that connected Africa, the Middle East and Asia, he said there was no doubt that Oman would remain an important player in the global energy market. 

OPEC launches 2013 World Oil Outlook, Annual Statistical Bulletin

Data-driven analysis to better understand the oil market



Among OPEC's various objectives, one of them is to continually strive to provide oil market data and analysis to energy stakeholders and to the general public. It does this by publishing different monthly and annual publications, which consider many aspects of the global oil industry – with an emphasis on OPEC Member Countries. Two of the Organization's flagship publications are the World Oil Outlook and the Annual Statistical Bulletin. The 2013 editions were presented at a press conference on November 7 at the OPEC Secretariat in Vienna, and the OPEC Bulletin offers a summary of the event.



The World Oil Outlook (WOO) and the Annual Statistical Bulletin (ASB) contain OPEC’s carefully gathered data and in-depth analysis of the global oil industry, offering perspectives on the past, present and future of the oil market.

Presided over by OPEC Secretary General, Abdalla Salem El-Badri, the press conference marking the official launch of this year’s WOO and ASB included presentations of the key components of each publication, followed by a question-and-answer period.

World Oil Outlook

Overall, the WOO aims at highlighting possible future developments in the energy scene, remaining alert to various possible outcomes and identifying the main challenges and opportunities that exist.

But one of the clear messages, as noted in the Foreword by the OPEC Secretary General, is that “there is no shortage of oil and resources are plentiful.” In fact, “increasing global oil demand is supported by an expanding diversity of supply sources,” he says.

The WOO is divided into two main sections: the first focusing on the upstream sector and the second concentrating on the downstream. As in previous years, the main points contained in the first section were presented by Garry Brennand, a Senior Research Analyst at the OPEC Secretariat.

Brennand gave an overview of the main assumptions of OPEC’s new Reference Case and then examined some of the most important outcomes for the medium- and long-term outlook for oil and energy supply and demand.

The first thing to recognize, Brennand said, is that with energy use set to continue to grow, “oil will play a major part in satisfying the world’s growing energy needs, with ample resources and a diversity of sources of supply.”

But there are still many uncertainties ahead related both in terms of the future of demand for oil in the medium- to long-term, as well as in the development of the various sources of supply.

In fact, El-Badri, in his Foreword, states that “one of the principal messages that we have repeatedly stressed is that it is important to remain vigilant given the many uncertainties and challenges for oil producers and consumers everywhere.”

Economic growth

Apropos of this, Brennand introduced the various scenarios considered in the WOO, which are used to consider the effects of various uncertainties. These include “the possible implications of alternative assumptions for future economic growth, as well as the possibility of upside supply potential compared to the Reference Case.”

He noted that “although global recovery from the recession is assumed to be slower than previously thought, for the medium term to 2018, global growth averaging 3.8 per cent per annum is stronger than in last year’s Outlook.”

In the longer term, however, other factors come into play which may have a significant effect.

For example, population growth is an important factor. World population is seen rising from seven billion in 2012 to 8.6bn in 2035, with the bulk of the increase coming from developing countries. “This increase,” explained Brennand, “together with productivity trends, leads to an average growth to 2035 of an average of 3.5 per cent per annum, also stronger than in last year’s publication.”

There are also assumptions about emerging energy policies which have shaped the Reference Case. Some which have already been passed into law have been incorporated into the WOO’s Reference Case.

However, “the viability of some targets is questionable,” said Brennand. Some policy targets — with regard to biofuels, for example — are considered by some analysts as somewhat over-ambitious, a fact reflected in the Reference Case.

Pictured above is Abdalla Salem El-Badri (third left), Secretary General, with (l-r) Dr Pantelis Christodoulides, Senior Statistician; Dr Omar S Abdul-Hamid, Director, Research Division; Oswaldo Tapia, Head, Energy Studies Department; Garry Brennand, Senior Research Analyst; Dr Jan Ban, Senior Research Analyst.

Continuing with the economic growth assumptions, Brennand noted that it was worth stressing certain changes currently underway in the Reference Case — specifically with regard to absolute GDP levels (in real terms).

In 2012, while GDP for OECD America and OECD Europe were higher than in China, the situation rapidly changes in the coming years. Eventually, China expands to become the largest economy in the world, while India's GDP is already approaching that of OECD Europe.

With such developments, the global share of GDP represented by OECD countries, which currently accounts for over half of global economic activity, falls to a share of 38 per cent by 2035, noted Brennand. "This underlines the growing importance of developing countries, particularly in Asia, for the analysis of oil demand," he added.

Despite these "realignments" in GDP, the data show that, by 2035, OECD regions will still have higher levels of GDP per capita. While some countries — like China and Russia, in particular — see strong per capita increases, the rest of the non-OECD countries remain at comparatively low levels. India, for example, sees its GDP amounting to just \$30 per day per capita by 2035, while it is even lower in other parts of Asia and in Africa.

World energy demand

In giving a quick review of the demand outlook for the projection period 2010–35, Brennand said energy demand in the Reference Case is seen increasing by 52 per cent. Fossil fuels, which accounted for 82 per cent of energy supply in 2010, end up constituting a comparable 80 per cent of the global total by 2035.

And "throughout most of the projection, oil will retain the largest share," he said. In the Reference Case, however, each fossil fuel type converges towards similar shares of around 26–27 per cent by 2035 (though, in volume terms, natural gas use rises faster than any other form of energy supply).

One point worth elaborating on is the increased attention being given to natural gas worldwide. This is closely linked to the emergence of shale gas as a growing source of supply in the United States and Canada, Brennand said. As noted in the WOO, the fact that gas prices are so low means the fuel is increasingly being used in the US for power generation, which could have important impacts and repercussions.

In fact, attention has already been turning more to the use of natural gas in the transportation sector, Brennand observed. However, as this year's WOO notes, there are many potential uncertainties surrounding the possibility of a continued rise in supply from shale gas, despite its rapid rise to date and its large resource base.

Brennand said that some of these uncertainties had to do with "concerns about environmental impacts, the disposal of waste water and excessive water use," as well as general questions about how fast the necessary infrastructure can be developed to make gas a core fuel in the transportation sector.

Oil demand prospects

Turning to oil demand prospects, the Reference Case sees demand for the medium term (2012–18) increasing by an average of 900,000 b/d annually, reaching 94.4 million barrels/day by 2018.

Over this period, noted Brennand, "demand in OECD America is stable, but falls in other OECD regions, so that OECD aggregate demand falls gradually, having peaked in 2005." Meanwhile, demand in Russia and Other Eurasia



increases only very slowly. "We still expect that by the second half of 2014, non-OECD oil demand will be greater than OECD demand for the first time."

Looking further ahead, in the Reference Case, long-term oil demand increases by close to 20m b/d over the period 2012–35, reaching 108.5m b/d by 2035, up from 107.3m b/d in the 2012 WOO.

This is the first upward revision since the WOO was first published, noted Brennand. Developing Asia accounts for 88 per cent of this increase. Meanwhile, demand in China, India and other developing Asia reaches 94 per cent of OECD demand by 2035.

As the data has suggested for the past years, transportation — especially in developing countries — is key to this increase in demand. In fact, the number of cars globally is seen as more than doubling over the next two decades, reaching an estimated 1.9bn by 2035.

China sees the largest rise by far in passenger car volume, which increases by more than 380m over the period. But similarly large increases are also expected

elsewhere in Asia, as well as in OPEC Member Countries. One important statistic is that by 2028, it is expected that “there will be more cars in developing countries than in the OECD,” Brennand said.

Supply outlook

Finally, turning to supply, Brennand noted certain supply increases in the Reference Case. Much of this has been in the US because of increases in tight oil supply. But tight oil may face various constraints and challenges in the future, some of which, as Brennand noted, could include steep decline rates and environmental concerns.

Thus, Brennand said that according to the Outlook, “tight oil is expected to plateau around 2017-19 and then decline steadily.”

In addition, total non-OPEC supply in the medium term increases steadily, he stated. It rises by 5.7m b/d over the period 2012–18, with many sources contributing to the net rise — such as oil sands from Canada, crude oil from Brazil and Columbia, Africa, Russia and the Caspian region, together with some increases in biofuels supply.

In the long-term, total non-OPEC supply in the Reference Case rises from 53m b/d in 2012 to 62m b/d by 2035.

Increases in non-OPEC liquids supply are expected from a wide diversity of sources. Latin America and the Caspian region will lead this expected volume increase, Brennand said. But total supply from the US and Canada region also continues to rise slowly because oil sands — and, to a lesser extent, biofuels — are seen as compensating for the expected fall in tight oil and other crude supplies.

Russia is actually seen reaching a plateau production of close to 11m b/d. And, in general, mature regions will see a long-term decline in output.

With regard to OPEC crude oil supply, over the long term, Brennand said, it rises in the Reference Case. “By 2035, it is over 37m b/d, more than 6m b/d higher than in 2012,” he said. Thus, the share of OPEC crude in world liquids supply over the period 2020–35 is in the range of 31–35 per cent.

Alternative scenarios

Brennand then turned his attention to describing in brief the alternatives to the Reference Case that are explored in the WOO. First, the impact of various alternative assumptions for economic growth, were explored for their impact

on both downside risk and upside potential. The Outlook sees average global economic growth “ranging from three per cent to 3.9 per cent per annum in the low and high economic growth rates, respectively,” Brennand said.

However, under the low economic growth scenario, oil remains below 100m b/d by 2035. “This is 10.1m b/d lower than in the Reference Case,” Brennand said. In fact, under such a scenario, the reduction by 2025 is already 5.1m b/d.

The distribution across countries, however, is not uniform: Some 77 per cent of the demand decline in this scenario is in developing countries. And if OPEC were to absorb this loss in demand, the call on OPEC crude oil then falls to 27m b/d by 2020 and “stays approximately constant at that level throughout the period to 2035.”

Under the higher economic growth scenario, Brennand said, the Outlook sees additional demand of 7.5m b/d by 2035, compared to the Reference Case. He added that in such a scenario, “demand exceeds 100m b/d between 2020 and 2025, more than ten years earlier than under the low economic growth scenario.” And by 2035, it reaches 116m b/d.

“This demonstrates the wide range of expectations for the amount of oil needed from OPEC,” he said. This, as OPEC has noted elsewhere, can lead to great uncertainties when it comes to investment planning.

Nevertheless, as pointed out by El-Badri in his Foreword, “Member Countries maintain their readiness to invest in the development of new upstream capacity, in the maintenance of existing fields, in the improvement of older infrastructure, in the construction of necessary pipelines, and in the building and expansion of oil terminals and refineries.”

These are important actions and “they demonstrate the commitment of OPEC Member Countries to satisfy the needs of consumers in a timely manner.”

Downstream sector

The second section of the WOO, which focuses on the downstream sector, was presented by Dr Jan Ban, also a Senior Research Analyst at the OPEC Secretariat. His comments elaborated on some of the main points of that section, which addresses several important issues — including the fact that the refining system will see an unavoidable need for continued rationalization.

In fact, Ban said, developments in the downstream sector are



“marked by existing surplus distillation capacity, mainly in the OECD regions and capacity expansion in developing countries.”

According to recent estimates, more than 9m b/d of new distillation capacity will be added globally in the medium term. This will be largely concentrated in two regions — the Asia-Pacific and the Middle East. The potential production from new projects is expected to exceed the incremental ‘call on refining’ every year, making for a cumulative overhang of 4m b/d by 2018, Ban said.

The 2013 Outlook also sees a period of “severe international competition for product markets and the need to continue refinery closures on a significant scale in the next few years,” Ban affirmed. According to the data, to return margins to long-term viable levels, refinery closures “in the order of 10m b/d may be necessary.”

All this, Ban said, implies an associated global utilization rate of at least 85 per cent and possibly even higher. To achieve such a utilization rate, capacity closures would have to occur across both the industrialized world and, to a lesser degree, in developing regions, he maintained.

But given past resistance to such closures, it remains to be seen how long the situation of relatively low global utilizations will persist.

Looking towards the long-term outlook for the refining industry, Ban noted that the data indicates that cumulative total crude distillation capacity additions are projected to reach 20m b/d by 2035.

However, he noted that this is based on the assumption that 7m b/d of refining capacity will be closed by 2020 (this figure is considered the amount that would have to be removed in any region in order to maintain a minimum refinery utilization in the region of 80 per cent).

The concentration of this capacity is primarily in Europe and OECD Asia, he noted, but it is also in the US and Latin America, albeit to a lesser extent.

Under such assumptions, Ban said, “the vast majority of new capacity is projected as needed in the Asia Pacific and the Middle East: almost 11m b/d in Asia and 3m b/d in the Middle East.”

In Latin America, in turn, projected capacity additions of more than 2m b/d by 2035 are closely aligned with the projections for demand growth for the same period.

And additions in Africa are projected at close to 2m b/d, followed by Russia and the Caspian, which will require more than 1m b/d of additional crude units by 2035.

The shift of future demand and refining capacity to developing countries will, of course, affect inter-regional movements of crude oil and refined products, Ban pointed out.

He noted projections which underscore the Middle East’s role in the future as both a major crude oil and products exporter (despite a

slight crude export decline in the medium term). Beyond the medium term, “total crude oil exports from the region will grow continuously,” he added, stating that this would be driven by rising demand in the Asia-Pacific, which will further develop as a major trading partner for the Middle East.

So, a combination of developments in the Asia Pacific region and in the US and Canada region leads to expectations of an overall shift in future oil movements to the East, Ban said, before concluding.

Annual Statistical Bulletin

The key findings and main messages of the 2013 ASB were then presented by Dr Pantelis Christodoulides, Senior Statistician in the Secretariat’s Data Services Department.

Although the interactive (online) version of the publication was made available in July, the official launch of the hard copy of the publication was timed to coincide with the launch of the WOO.

The majority of the data compiled in the ASB has as its source the OPEC Annual Questionnaire, which is sent for completion to all Member Countries by the Secretariat. It is, thus, Christodoulides noted, “an excellent demonstration of OPEC’s commitment towards data transparency.”

This year’s edition of the ASB includes various messages. First, the data show that, in 2012, world crude oil reserves experienced increases of around 13bn b. This left world crude oil reserves at 1.5 trillion b at the end of 2012, marking a cumulative increase of almost 200bn b since 2008.

In terms of OPEC Member Countries, crude oil reserves there increased slightly during 2012 — by 2.5bn b. This leaves “OPEC’s share of total world reserves at the end of 2012 largely unchanged at 81per cent,” he said.

And by the end of 2012, crude oil reserves in OPEC Member Countries stood at 1.2tr b. Elaborating on this further, Christodoulides noted that “during the last decade ... the net additions to crude oil reserves for OPEC Member Countries were more than three times larger than their cumulative production.”

Separately, the 2012 data show that the world experienced rising natural gas reserves as well, with the largest additions taking place in Russia and the US. Overall, world natural gas reserves stood at 200tr cubic meters, he noted.

In OPEC’s Member Countries, natural gas reserves increased slightly at the end of 2012, “amounting to 95tr



Dr Pantelis Christodoulides

cu m, with their share of total world reserves remaining unchanged at 48 per cent.

“To meet increasing world oil demand, crude oil production rose in 2012 by 2.4m b/d to stand at 72.9m b/d,” noted Christodoulides, while OPEC Member Countries took the largest share of this increase, producing 32.4m b/d on average.

Elsewhere, rising crude oil production in 2012 was observed in North America, particularly in the US. And with the exception of OPEC Member Countries, in Europe/Eurasia and Africa, crude oil production decreased.

Looking at the numbers, non-OECD countries were the driver behind world oil demand growth for the third consecutive year in a row. In OPEC Member Countries, oil demand also increased in 2012 — by around 300,000 b/d — with the greatest increase relating to the most consumed product categories, distillates and gasoline.

Moving to the trade numbers, diverging oil trade patterns can be seen during 2012 across different world regions. There was stronger US production, which, when combined with weaker oil demand, implied less oil imports in North America.

In the Asia Pacific, oil imports increased for another year, especially in China. Finally, “shrinking North Sea crude oil production and falling refined product output” have resulted in higher net oil imports in Western Europe, said Christodoulides, despite contracting oil demand there.

Also, the data showed that, once again, in 2012, the Asia Pacific was the main destination for oil (crude and products) exports from OPEC Member Countries. Almost 16m b/d — that is more than half of the total of 29.6m b/d — of exported crude oil and products from OPEC Member Countries were imported into the Asia Pacific region.

Charting the future

In his concluding remarks to the press after the formal presentations, Dr Omar S Abdul-Hamid, Director of the OPEC Research Division, emphasized that the WOO and the ASB “underscore the importance of energy to the world’s past, present and future.”

He also noted that “the sharing of viewpoints is critical to our industry’s future,” with both publications demonstrating this.

“They are not only the result of close collaboration and coordination between the Secretariat and our Member Countries, but are also a sign of OPEC’s ongoing commitment to dialogue as a means to help secure a

sound and stable oil industry,” he stressed.


Abdul-Hamid further noted that the WOO “underlines the increasingly complex nature of our industry,” and sheds light on various aspects — such as “the continued interdependence of all nations; the importance of understanding both supply and demand prospects ... and the need to better understand the opportunities, challenges and uncertainties in the overall outlook.”

He also pointed out that the WOO did not make predictions: “We believe the Outlook should be viewed as a tool of reference to stimulate discussion and debate among industry stakeholders,” he said, “which we hope will lead to a better understanding of the future of the industry.”

And with regard to the ASB, which essentially complements the Outlook, Abdul-Hamid said it has “once again illustrated OPEC’s ongoing commitment to transparency and data-sharing as key elements in achieving oil market stability.”



Activities such as this — providing and sharing data and analysis are, indeed, important. And, as the OPEC Secretary General notes in the Foreword to the WOO, “this, in addition to the many other ongoing efforts that we make throughout the year to exchange views with other energy stakeholders, and to enhance and maintain dialogue with other partners, has become a permanent part of the work of the OPEC Secretariat.”

Both the WOO and the ASB are available for free download at: www.opec.org. The latter is also available as an interactive on-line version with time-series data going back to 1960. 

CCS in the CDM workshop sheds new light on innovative subject

By Maureen MacNeill



Workshop participants gather for a group photo.

Participants at a workshop intended to provide OPEC Member Country experts with important updates on carbon capture and storage (CCS) were pleased with the outcome of the two-day event, held at the OPEC Secretariat on October 29–30.

It was the second joint activity OPEC has undertaken with the International Energy Agency Greenhouse Gas R&D Programme (IEAGHG). The first — a CCS workshop organized in Algeria in November 2009 — covered CCS technology and processes.

This time around, the workshop included not only the latest information on CCS technology, but also discussed its recent inclusion in the Clean Development Mechanism (CDM) of the United Nations Framework Convention on Climate Change (UNFCCC). “Our major objective is to discuss the recent inclusion of CCS in the CDM ... and to help you understand how to apply for a CCS project under the CDM,” commented OPEC’s Research Division Director, Dr Omar S Abdul-Hamid, in his welcoming speech.

With the topic of climate change and atmospheric

warming a growing global concern, the oil industry is coming under pressure to address emissions related to the burning of fossil fuels. This is of great interest to OPEC Member Countries, as well as the fact that they are equally — or more so — affected by climate change impacts. “CCS is a critical part of climate change solutions and it is technologically viable. It is, therefore, important to all stakeholders,” Abdul-Hamid pointed out.

He said that although CCS is only one of many tools addressing climate change, some studies show that CCS alone can contribute 17 per cent of the total emissions reductions needed to keep global temperatures below 2° C by 2050. He praised “extensive efforts on behalf of some Member Countries and developing countries,” to have CCS accepted in the CDM.

Abdul-Hamid stated that CCS technology has matured and is now considered feasible for a variety of sectors. In transportation, for example, it has been recently demonstrated that passenger cars can be equipped with CCS on-board technology. CCS can also be used to reduce the



Dr Omar S Abdul-Hamid



Tim Dixon

emissions of large transport vehicles, such as ships, by up to 65 per cent. This is important because CO₂ emissions from ships are estimated at over one billion tonnes/year.

Abdul-Hamid noted that the British government has already included maritime emissions in the reduction targets set by its Climate Change Act. The International Maritime Organization (IMO) is also expected to drive a reduction in emissions from international shipping.

The Research Division Director said innovative approaches are coming which will help create value from captured CO₂, such as integrating CCS with algae farming for the simultaneous production of biofuels, animal feed and fresh water.

Such 'biorefineries' — which directly utilize CO₂ from anthropogenic sources like power plants, refineries, or cement plants — are already in pilot stages and have reached pre-commercial scale with some technology packages ready for licensing.

"There are clearly a lot of interesting developments in CCS," Abdul-Hamid affirmed.

Tim Dixon, Technical Programme Manager for IEAGHG, said he is very pleased to have OPEC as a member of the Programme.

"I think it is very important to have OPEC as a member. It brings in very important countries in the world in the area of energy, also in particular with the application of CCS ... in those countries."

Dixon explained that the IEAGHG was established in 1991 as a collaborative research programme by the IEA. Its primary job is to provide information on the role that technology can play in reducing greenhouse gas emissions from the use of fossil fuels.

"The primary technology we have focused on over these 22 years is CCS ... with the work we produce, we aim to be independent and objective. Not policy prescriptive, but policy relevant."

The IEA GHG is funded by 19 countries, OPEC, the European Community and 22 companies, stated Dixon. Its flagship activities include producing reports (over 250 have been published on all aspects of CCS); bringing



Dr Taher Najah



Neil Wildgust

together research communities on CCS on a regular basis—“the expert speakers we have today,” for instance, “are drawn from a pool of experts around the world”, observed Dixon. Other activities include linking up leading experts in the world on these topics on a regular basis; planning summer schools for students and young professionals; organizing peer reviews; and actively contributing information and evidence into the international regulatory arena.

Specific interests

Speaking on what to expect at the workshop, Dixon said it “... will focus on the technical issues most relevant to what is most required under the CDM,” adding that the programme was put together in conjunction with the OPEC Secretariat to meet the specific interests of its Member Countries.

He thanked OPEC’s Downstream Oil Industry Analyst, Dr Taher Najah, who worked with the IEAGHG on developing the programme and Abdul-Hamid for helping to host the workshop and for envisioning having CCS in the CDM as its theme.

The workshop was held over two days and touched on various aspects of the CCs and CDS requirements, with the group work and material on CDM procedures being used for the first time.

The first day covered the latest developments in all aspects of CCS, including an overview of the technology and applications of CCS, as well as a look at storage

mechanisms, site selection, characterizing and modeling, risk and safety assessment, monitoring and environmental impact, regulatory frameworks and liability, and costs and economics.

Some case studies of actual CCS projects were also presented, as well as some potentially ground-breaking technologies.

Dixon gave an initial presentation covering the latest news on global CO₂ concentrations, an explanation of CCS, information on CCS in various regions and an overview of CCS research in industry, while John Davison, IEAGHG Project Manager, discussed CCS applications in both the power and non-power sectors.

This included a review of technologies in the power sector, examples of existing large plants and future developments and challenges in the area. He talked about oil refining and chemicals in the non-power industry, as well as the cement, iron and steel industries, providing examples and explaining the challenges for CCS in industry.

In a later presentation, regulatory frameworks were covered by Dixon, who provided an overview of why developments started to progress, Intergovernmental Panel on Climate Change (IPCC) GHG inventory guidelines, marine conventions and EU regulations and the Emissions Trading Scheme (ETS), in conjunction with the UNFCCC.

Neil Wildgust, Acting CEO of the Petroleum Technology Research Centre, gave a presentation showing various geological CO₂ storage systems and ways of uncovering existing geological conditions.

“The most important storage in the world is depleted



Dr Owain Tucker



Dr Katherine Romanak

oil and gas reservoirs,” he said, adding that a main advantage is the knowledge that the reservoirs have already trapped fluids subsurface, so there is a proven seal and thus a high chance CO₂ will be retained.

The presentation discussed two projects in Saskatchewan, Canada, where CCS has been used for over a decade to provide local oil fields with enhanced oil recovery (EOR).

Wildgust went into more detail about the Weyburn-Midale and Aquistore projects in a second presentation. He also talked about the importance of caring for public perception, provided an overview of global CO₂ geological storage potential in hydrocarbon fields, and also spoke about how CO₂ storage can be increased through EOR. Dynamic modelling

Dr Owain Tucker, Global Deployment Leader — CCS and Contaminated Gas, Shell, made a presentation on site selection, characterisation and modelling. Using his experience from Shell as illustration, Tucker described various types of storage, and covered issues related to capacity, containment and dynamic behaviour. “In CCS you also have to understand seismic, fault systems and stresses,” in addition to all the information already required for the oil and gas industry, he said. “You need to know every layer.” Dynamic modelling results help uncover such information, he said.

A second presentation by Tucker covering risk and safety assessment explained what risk is and offered a risk assessment example. It underlined the need for risk and uncertainty to be addressed at every phase of a

project and described the different risk elements which would potentially be focused on by different stakeholders, as well as the necessity of monitoring and remediation plans.

He later discussed Shell’s Quest and Peterhead projects, concluding with an overview of Shell’s global CCS experience.

Providing more detail on this, Dr Katherine Romanak, Research Associate at the University of Texas in Austin, gave a presentation on monitoring and environmental impacts.

The presentation showed that risk assessment aided by modelling adds to the assurance of storage permanence. She showed that a number of monitoring techniques at different depths provide comprehensive means to oversee the behaviour of injected CO₂.

In addition, she explained that wells are a plumbing problem that can be fixed and CO₂ in aquifers is not necessarily problematic for groundwater quality, or the biosphere. When there is an impact to the biosphere, it is usually spatially limited, she stated, adding that research efforts in predicting impacts, locating seeps, quantifying seepage, and remediation techniques are ongoing.

Liability is an important subject and this was covered by Luke Warren, Chief Executive, Carbon Capture and Storage Association. He discussed liability types, responsibilities and mechanisms, concentrating on EU legislation.

He talked about CCS liability arrangements, the definition of CCS liabilities, allocation of liable entities and



John Davison



Luke Warren

alternative approaches to allocating liable entities, and provisions which can be taken to meet liabilities.

Davison's presentation on CCS costs and economics outlined various cost methodologies, the cost of CO₂ capture at power plants and at non-power industrial plants and the factors which affect industrial CCS costs.

He stated that CCS is expected to almost double the capital cost of power plants; the cost of electricity will increase by about 40–80 per cent; the cost of abatement is around €60–100/t CO₂ for base load power plants, though first-of-a-kind CCS plants will be more expensive than following plants.

He added that costs should drop due to a natural learning curve and the introduction of new technologies and that it is important to look at CCS costs in the context of future energy systems.

In addition, he said, some opportunities exist for low-cost CCS in industry; in general the costs of industrial CCS are highly uncertain.

Overview of the CDM

The second day of the workshop commenced with an overview of the CDM, given by Paul Zakkour, Director of Carbon Counts. The main aspects of the presentation were: origins of the CDM, rules and governance, principles underpinning the CDM (equivalency and comparability, methodologies and monitoring, baseline, additionality and conservativeness); procedures and documents; and status and future outlooks.

Some of the key documents involved in the CDM

procedure were described as well as the current status of CDM and the outlook for new forms of climate finance.

Zakkour later detailed the application procedures for CCS in the CDM, in order to introduce participants to CCS-specific CDM procedures. He described various templates and procedures for making new submissions, as well as the key issues and uncertainties involved in this process.

He added an explanation on the specific rules under the CDM relating to CCS. His presentation referred to the six negotiating bodies relevant to CCS under the UNFCCC and Kyoto Protocol and described some key issues of concern. It also outlined various elements of modalities and procedures for CCS in the CDM, in relation to requirements, liability, provisions and project closure.

Delegates participated in question-and-answer sessions after each presentation, provoking lively discussion and debate on all the topics covered.

In the afternoon of the second day, participants divided into two groups to create a hypothetical CCS CDM project application, constructed especially for the workshop.

In doing so, they discussed key topics related to boundaries, project emissions, baselines, additionality, regulatory issues and monitoring. Based on the information provided in the workshop and from participants' own perspectives, they identified key issues and applied answers and approaches.

Following the group work, participants attended a plenary session where feedback was provided and experts contributed their own thoughts and ideas on the questions



which had been posed. Participants agreed that the exercise had been useful.

They also felt that there may be a need to communicate with governments regarding new procedures and that training is required to learn how to satisfy the UNFCCC Executive Board and ensure project acceptance.

It was considered very important for OPEC Member Countries to try and apply for CCS projects under the CDM because it is necessary to demonstrate to the world that CCS is helpful and safe on a large scale. Otherwise, it was felt it may be difficult to convince negotiators of the 2015 accord to accept CCS as a mechanism, even though it is already eligible under the Kyoto Protocol.

Eye on the bigger objective

OPEC Member Countries were advised to try to remain active until 2020, keeping their eye on the bigger objective of a new agreement, rather than today's unattractively low carbon prices.

It was felt that the mission is larger than before; CCS is just starting and cooperation is needed between Member Countries and specialists in the field.

Dixon agreed that it was "a major achievement to get CCS in the CDM," but added that it is only a step on the way to achieving a global agreement and to having CCS included in future funding schemes and mechanisms.

As the talks have just entered the detail and implementation stage, OPEC's hosting of the workshop is very timely, he added. Still, there is more work to be done, including the translation of procedure requirements

adapted to include CCS into conventional CDM terms, he noted, adding that working through the requirements for CCS and CDM has proven very useful.

Participants acknowledged that the road ahead is still long. The process is currently underway for completing modalities and procedures to create the Green Climate Fund, under which eligibility for funding, projects, investments and sources of financing will be discussed. This has an impact on CCS projects.

It was considered important to continue the dialogue between Member Countries and experts, as well as to engage the Secretariat to gain from its knowledge and experience in the exchange of technical information and have it reflected in the modalities of the Green Climate Fund. It was also important to continue to reflect on the financing aspect of the CCS.

Speaking about the next workshop, Najah stated that it may be more about CDM, with more active participation from Member Country experts, possibly with their own case studies.

He added that the OPEC Secretariat looks forward to more cooperation with the Programme, stressing that the current workshop has served to initiate more interest in OPEC Member Countries on the subjects of CCS and CDM.


In his closing remarks, Abdul-Hamid observed that CCS seems to be moving in the right direction and that more experience is being gained internationally.

He said he was happy to see a link with CDM, which introduces these technologies into formal mechanisms and addresses the fundamental issue of managing CO₂ emissions as a result of fossil fuel combustion.

Abdul-Hamid maintained that there is a need to invest more into spreading knowledge and awareness to increase the effectiveness of such technologies and mechanisms, adding that the Secretariat will continue looking at the historical background and evolution of the whole issue of managing emissions.

The Secretariat will also continue to support increasing capacity among Member Countries through different programmes and engagements, which will be fostered based on their demands, he noted.

Abdul-Hamid was optimistic that all parties are on the right track, particularly in partnering with each other to develop solutions.

The IEAGHG urged any countries which have potential CDM projects to move them forward, adding that it would be interesting to know about potential projects, as well as to see some examples of CCS projects coming through the system. 

GEORGIA TECH sets benchmark for energy research excellence

The Georgia Institute of Technology (Georgia Tech) is one of the top research universities in the United States and worldwide and has established several important partnerships with some OPEC Member Countries. Situated in Atlanta, Georgia, one of its main aims is to create innovative solutions to the world's current and future energy challenges. This is done through its Strategic Energy Institute (SEI), which integrates and leverages the wide range of research and development (R&D) being carried out at the university.

*The SEI's Executive Director, **Timothy C Liewen**, recently took time out to share his views on the oil and gas industry with the OPEC Bulletin's **Scott Laury**. In the following question-and-answer article, he discusses a wide range of issues related to the oil and gas industry, including prospects for tight oil and shale gas, natural gas, innovative exploration and development research, sustainability issues, talent acquisition for the industry and the various research projects being carried out with OPEC Members.*



Professor Lieuwen, tell me about your role at Georgia Tech and SEI.

I have been a professor at Georgia Tech since 1999, primarily focusing on low emissions combustion. Much of my work focuses on the technical challenges associated with low emissions gas turbines used for power generation or aircraft propulsion. Starting last August, I also assumed the role of Executive Director of the Strategic Energy Institute (SEI). The mission of the SEI is to coordinate all of the cutting-edge energy research that is being done in different areas of the university and leverage this expertise to help solve energy challenges. We have more than 100 experts supporting energy-related research and development.

What research are you doing in areas related to the oil and gas industry?

Fuels and value-added chemicals represent a large area of Georgia Tech's energy-related research. This includes the production of new fuels, such as cellulosic ethanol from Georgia soft woods, biodiesel and ethanol from algae, as well as the development of more efficient, cost-effective and environmentally-sound ways of utilizing and recycling current hydrocarbon resources, such as coal, oil, natural gas and shale oil. To help limit and mitigate many of the environmental concerns associated with the use of carbon-based fossil fuels, Georgia Tech researchers are developing technologies for fuel clean-up, exhaust gas clean-up and carbon capture.

Catalysis, which involves converting one chemical to another, is another focus of Georgia Tech energy research. Utilizing catalysts and catalytic processes, Georgia Tech researchers are converting both fossil-based raw materials (coal, natural gas, crude oil) and renewable feedstocks (biomass) into clean chemicals and fuels that can be used in a variety of applications, including combustion to provide heat and power, direct conversion to electricity in fuel cells, and for liquid fuels production for use in aircraft engines and automobiles.

In addition to fuels, Georgia Tech conducts a lot of research on power and energy generation from fuels. This includes combustion, which is my primary area of research, as well as gasification, which is used in many chemical plants and with nuclear power.

Transmission and distribution is another area of Georgia Tech's energy-related research. This area focuses on improving overall network reliability and energy efficiency. There has recently been a lot of discussion on and investment in "smart grid" technologies that will help make power networks more resilient and responsive to changing energy needs.

Energy utilization with energy-efficient building technologies, such as heat pumps, motors, high-efficiency devices for light-emitting diodes (LEDs) and electric cars is also a strong area of Georgia Tech's energy research efforts.

Looking at tight oil specifically, do you think it will have an impact on pricing as much or more than natural gas?

All images in this feature courtesy of Georgia Tech.



Timothy C Lieuwen (pictured above) is Executive Director of Georgia Tech's Strategic Energy Institute (SEI), which was founded in 2005. Lieuwen has been a Professor in the School of Aerospace Engineering since 1999 and is a leading international expert on clean energy, in particular low-emissions combustion. The US Secretary of the Department of Energy appointed Lieuwen to the National Petroleum Council (NPC) in February this year, where he joined other distinguished energy leaders who are responsible for advising the Secretary on matters related to oil and natural gas. He earned both his Masters and PhD at Georgia Tech, which is consistently ranked among the top engineering universities worldwide.

In terms of pricing, it's not clear to me that shale oil will necessarily have a big impact on pricing as opposed to natural gas where you can see some fairly massive price differences around the world. The price of oil is so cheap to ship; it is pretty much a globally priced commodity.

A lot of people in the US are starting to talk about oil independence, or substantially reducing the need for imports, but what I don't think they appreciate is that oil, being a globally priced commodity, is not going to shield the country from price shocks, unless it was exclusively producing its own oil and was a totally insular economy.

Oil also has a significant impact on geopolitics and commodity flows. Saudi Arabia has a lot of crude oil and a lot of shale oil, but they are not going to have the singular grip on oil supplies, although certainly the cheapest oil supply by a long margin. It will be particularly interesting to see if the US and China can move forward in the spirit of cooperation in accessing their own resources, rather than competing for limited resources as both countries try to expand their influence in various regions around the world, including the Middle East and Africa.

Is China actively pursuing tight oil?

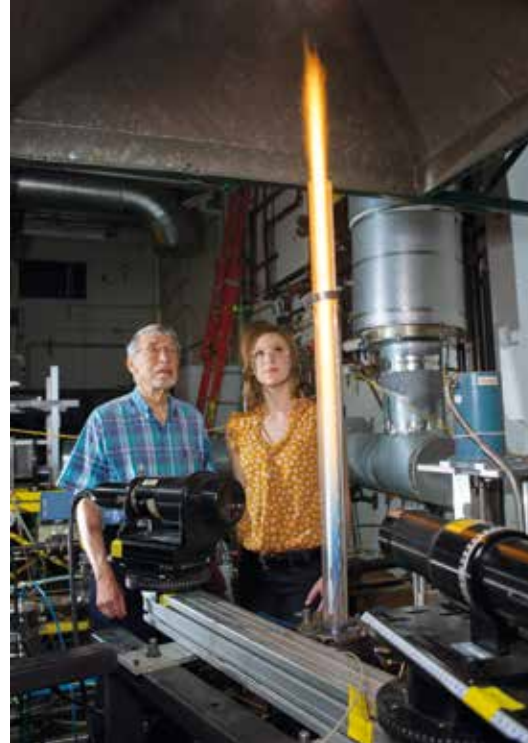
Yes, absolutely. Though the figures are highly uncertain, if you look at some of the numbers on shale gas reserves, China has more shale gas reserves than anybody, including the US, so they are very interested in accessing these resources. The country is really focused on this issue right now. I understand that there is a major shale oil conference in China every week that brings a broad group of stakeholders together to discuss the country's energy strategy as it relates to shale.

In Europe, there is more resistance to shale oil due to environmental concerns. Is there any of this sentiment in the US?

There is — you are hearing about this in New York and California these days, as well as somewhat in Michigan. California is a very environmentally-conscious state in the US. There was a bill proposed there that would restrict fracking, but it was not adopted, and California will probably begin exploiting their own shale resources soon. I think that the economic impacts are so enormous that it is hard to pass up.

How quickly do you think the tight oil and shale gas development will move forward?

It is amazing to see how quickly things are moving already now with regards to shale oil. My research focus at Georgia



Georgia Tech combustion researchers test the properties and characteristics of fuels using the Jet-A spray auto-ignition facility in the Ben T Zinn Combustion Laboratory.

Tech is combustion and, five to six years ago, we were doing a lot of work to determine the impact of importing LNG on our natural gas-fired power generation because the gas composition is a little different than domestic gas. Now, we're talking about exporting natural gas. So, just to see how quickly this transformation has happened is amazing.

Is the tight oil production process sustainable? Is it costly? What is the time frame of the process?

In terms of sustainability, there are a few adverse impacts. The first one is seismic activity. When you start pumping liquid under high pressure into the ground, you can induce seismic activity, so there have been some questions on that.

Probably the biggest issue is groundwater. In general, groundwater is not nearly as deep as where the fracking occurs, so people who support the practice would point out this differential to you.

I was recently at the IHS CERA conference and attended a panel on water usage in fracking. What was very clear to me is that the water treatment issue is evolving very rapidly. The big oil service providers, such as Schlumberger, know that groundwater is going to make or break this deal. And so it is very clear that they are putting a lot of time and effort into this issue. It is not entirely clear to me what concerns are still up to date and which ones are not, merely because the amount of water they are using has dropped a lot, and they're recycling a lot of water.

I am not a water guy, but what's clear to me is that the situation is evolving very rapidly as to how they handle groundwater.

In terms of sustainability, there are certainly concerns from environmentally-minded people on what this shale development is going to do to the prospect of renewables. With natural gas being so cheap in the US, it is just taking the wind out of the sails of a lot of renewables and I am sure the same thing is happening elsewhere. The prices of wind and photovoltaic energy have come way down, but it is still hard to compete with the low energy prices that the shale gas boom has enabled. Natural gas is a carbon emitter, though it emits half the carbon of coal, so it does have a net global warming impact.

The US Secretary of Energy, Dr Moniz, talks about natural gas as being a "bridge fuel" that over the next 40 to 50 years could transition us to an entirely renewable future where we are emitting vastly less carbon. But certainly, if you burn natural gas, you put carbon into the air. When you put natural gas into the air on its own, it's a much more potent greenhouse gas, warmer than carbon dioxide. So, there is a lot of talk about how much natural gas leakage occurs at these fracking sites. However, one important factor I think people don't necessarily point out is that although natural gas is a much more potent greenhouse gas emitter, it only stays in the atmosphere for 10 to 20 years versus carbon dioxide, which can stay in the air well over 100 years. Therefore, as far as the long-term effects go, it is quite different.

Do you have any idea of the costs and investments involved in doing it right from an environmental perspective?

I don't have any specific numbers, but it is my sense that the large energy companies are spending a lot of money and are being very careful. But the concern is that there are shortcuts being taken by other companies that may not share this concern for the environment that could not only erode public trust and confidence, but have significant consequences for the environment, the industry and the regulatory landscape.

Moving on to the talent acquisition issue, are institutions of higher education such as Georgia Tech adequately serving the needs of the oil and gas industry in terms of providing the talent required by the industry now and in the years to come?

Georgia Tech is the largest educator of engineers in the US. We are educating students across the whole span of

upstream, midstream and downstream. More specifically, we have a lot of R&D activities with the oil majors, such as Master agreements with ExxonMobil; we also do lots of work with Phillips, BP, Shell and Chevron, in addition to Saudi Aramco and Total.

Most of the large petrochemical companies are engaged with research at Georgia Tech. When we engage with these companies, certainly R&D is something of interest, but, frankly, another big piece of it is just developing the student pipeline for companies seeking talent. We're seeing a lot of interest across the oil and gas sector in engaging with Georgia Tech, not only for research, but for developing that pipeline.

We also have fairly significant distance learning programmes, as well as international education programmes. Take the Kingdom of Saudi Arabia, for instance; there are a number of different types of educational outreach programmes, professional Master's degrees and other types of initiatives with the King Abdullah University of Science and Technology (KAUST), with the King Fahd University of Petroleum and Minerals (KFUPM) and with companies like Saudi Aramco.

Do you have similar working relationships with other OPEC Member Countries?

Yes, we have partnerships established with Nigeria, Saudi Arabia and the United Arab Emirates. In fact, we recently had the Minister of Science and Technology from Nigeria come to meet with us to discuss future collaboration. So, these are exciting developments. *(Please see side feature 'Partnerships with OPEC Member Countries' on p65).*

Do you agree that talent acquisition is a major issue for the oil and gas industry?

Yes, absolutely. In working with our industry partners, it is clear that talent acquisition is a big piece of a larger relationship. In fact, we have recently just completely revised our whole Master agreement framework. Negotiating a Master agreement as opposed to a project-specific agreement is common between large companies and universities like Georgia Tech.

Negotiating some of these agreements can take a year or two for companies to see eye-to-eye on all the intellectual property (IP) terms. So, that's why we've just revised the framework for these agreements, in order to expedite how we interact with big energy companies and create much more rapid negotiations on agreements and IP. More details on this can be found at: www.industry.gatech.edu.

What percentage of students enrolled at Georgia Tech are studying topics related to the oil and gas industry?

Though I don't have a specific figure, I can tell you that the energy industry as a whole is a big draw for our graduates at Georgia Tech. Whether it is oil and gas, grid, power generation or electronics, a lot of our students are moving into the energy industry after they graduate.

As far as exploration goes, are there ways, technically speaking, that producers can utilize to discover oil and bring it to market more quickly today than in the past?

Yes, at Georgia Tech, we have the largest geotechnics group nationwide in our civil engineering department. They have been actively working on fracking for decades. We also have a very extensive geosignal processing/seismic processing/geoprocessing group. Our computer/electrical engineering group is also the largest in the country.


OPEC's long-term strategy states that technology is one of the key drivers of future energy supply and use. It also states that OPEC supports the development and promotion of technologies that advance the environmental performance of oil and advocates the continuous improvement in standards for exploration and development activities to minimize the industry's environmental footprint. Can you give some examples of where Georgia Tech is working in this area of technology and sustainable development?

The whole area of separations, separating one gas from another and next-generation separation, which I touched on previously, is a major focus. We have the best separations group in the country, which is housed in our chemical engineering department.

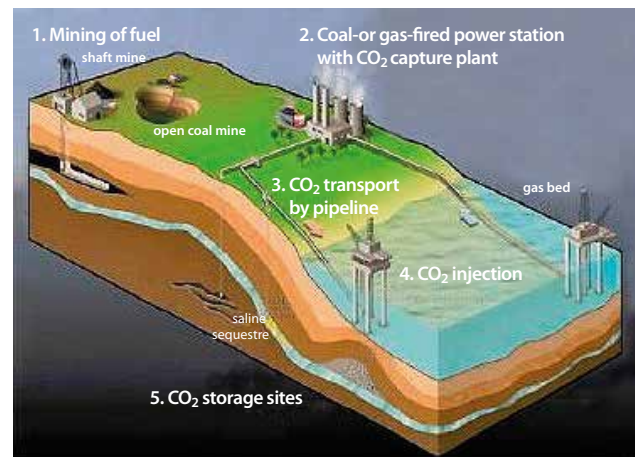
Water usage and sustainability are other areas we focus on through our civil engineering department, as well as at Georgia Tech's Brook Byers Institute for Sustainable Systems, which is an institute here at Tech that focuses on sustainability issues.

Another topic is the utilization of hydrocarbons and low emissions combustion. We have the largest combustion research group at Tech focused on more cleanly burning and utilizing fuels, which include hydrocarbons, fossil fuels and alternative fuels. Chemicals, advanced chemicals, catalysis and upgrading are other areas researched by our catalysis group.

Materials in extreme environments is an additional area of focus for us. This research is conducted in our mechanical engineering group, as well as in our dedicated material sciences department. When you are trying to extract, refine and utilize oil and gas, these processes are done in very high-temperature, high-pressure environments. For example, with the whole BP issue (Deepwater Horizon oil spill), one of the major challenges sitting at the bottom of the ocean was that the pressures were just phenomenal.

We also have the Georgia Tech Research Institute (GTRI), which is our applied research arm that looks at areas such as remote sensing, which would be applied to sensing in extreme environments, such as in the Arctic, or the desert, or for pipelines — basically sensing in areas where it is hard to figure out what is happening. 

A unique material for carbon capture and sequestration (CCS)




Georgia Tech School of Chemical and Biomolecular Engineering Professor Christopher Jones and his team have developed a new material called hyperbranched aminosilica (HAS) that captures and stores carbon dioxide emissions directly from the emissions source, such as smokestacks at coal-burning power plants and chemical facilities. The team has also successfully used this technology to remove CO₂ from even very dilute gas streams, such as ambient air.

Aminosilica is formed through covalent bonding (combining two molecules by joining their electrons) that binds nitrogen-based organic compounds called amines with silica (quartz). The result is a powdery substance that looks like white sand. The name hyperbranched comes from the branch-like structures that form within the substance as a result of the bonding. The tips of the branches contain amino sites that capture CO₂.

When HAS is combined with sand, the team found that the resulting compound was capable of trapping CO₂ when flue gases — emissions found in smokestacks — passed through it.

The HAS compound not only captures CO₂ but hangs onto it. To release the CO₂, the material must be heated, after which the released CO₂ can then be captured and stored (either as a gas or cooled into liquid form). This process not only reduces CO₂ emissions, but also makes it possible to reuse the captured CO₂ to feed biofuel stock.

Hyperbranched aminosilica has several advantages over other methods of carbon sequestration. It is recyclable and can therefore be used over and over again. The material also is not affected by moisture, which is a plus since water vapour is present in flue gases. Unlike traditional energy-intensive methods, HAS requires very little energy input, which comes from the generation of the heat that releases the CO₂. 

Partnerships with OPEC Member Countries


Nigeria:

- In August 2013, Georgia Tech hosted a high-level delegation led by the Minister of Science and Technology of Nigeria. A general memorandum of understanding (MOU) between Georgia Tech and the Ministry was signed on this occasion to initiate a partnership involving three universities in Nigeria.

Saudi Arabia:

- Georgia Tech and King Fahd University of Petroleum and Minerals (KFUPM) started a strategic partnership in 2010. Since then, a study abroad programme and a joint research centre have been established. For the last three years, 10 to 15 KFUPM junior/senior students have been spending autumn on the Georgia Tech campus taking engineering and math courses. These students also engage in the American college life experience. They have become ambassadors of Georgia Tech at KFUPM and in Saudi Arabia. In 2012, the Center for Energy and Geo Processing (CeGP) was established where faculty from both universities collaborate on research projects focused on seismic signal processing and other energy information processing. CeGP also funds joint projects on education. In 2012, Georgia Tech President, G P Peterson, joined the International Advisory Board of KFUPM.
- In 2013, Georgia Tech and Saudi Aramco signed a contract to establish a Master's degree programme in the area of sustainable electrical systems.
- The Center for Enhancement of Teaching and Learning (CETL) at Georgia Tech hosted more than 30 faculty members from Saudi Arabia's King Saud University (KSU) for two consecutive summers. The KSU faculty spent two to three weeks taking courses and training in developing skills for a 21st century education and learning experience.
- Professor Bill Koros (Chemical and Biomolecular Engineering) is in the sixth year of a project with King Abdullah University of Science and Technology (KAUST), focused on improved membranes and sorbents for large-scale energy and environmentally efficient purification processes. The project will continue into a seventh year beginning in July 2014. Also, Professor Jean-Luc Bredas (Chemistry) is Co-Principal Investigator (PI) for the Center for Advanced Molecular Photovoltaics funded by KAUST from 2008–14. This has led to collaborative work with researchers at Stanford, the University of Southern California and KAUST. He is also Co-PI for a faculty-initiated collaboration funded by KAUST to work with Professor Aram Amassian (KAUST) and Professor John Anthony (University of Kentucky) on novel molecules for organic solar cell applications.
- Professor Jean-Luc Bredas (Chemistry) is Adjunct Professor at King Abdulaziz University (KAU, Jeddah) in the Department of Chemistry since 2011 and serves as a member of the International Advisory Board for the KAU Center of Excellence for Advanced Materials Research. This has led to strong collaboration between his research group at Georgia Tech and the Computational Chemistry group at KAU funded through a KAU International Cooperation grant.

United Arab Emirates:

- For four years ending in spring 2013, the Language Institute at Georgia Tech was the hub for all US scholars from the Emirates Nuclear Energy Corporation (ENEC). These students spent between three to nine months on the Georgia Tech campus learning English, taking SAT and TOEFL exams, and receiving cultural training that helps them transition into American college life.
- Georgia Tech and Khalifa University of Science, Technology and Research (KUSTAR) in Abu Dhabi signed a MOU for cooperation in education and research. Georgia Tech Professor, Steve DeWeerth, has been involved in helping KUSTAR establish a new Department of Biomedical Engineering and a Medical School. 



Reuters

NATURE'S FURY

Above: Winds of more than 380 km/hour caused a trail of death and destruction.

With wind speeds of up to 380 kilometers per hour, super typhoon Haiyan made landfall in the Philippines, wreaking havoc on a nation and its people and, in the process, unlocking the kindness, empathy and goodwill that abound in people around the world.

For the people of the Philippines, Friday, November 8, 2013, was a day like no other. Though widely publicized and so, awaited with nervous trepidation, when typhoon Haiyan eventually made landfall at Guiuan, in Eastern Samar with no let-up in its intensity, it packed wind gusts of more than 380 km per hour and brought floods so devastating that a trail of death and destruction followed in its wake, taking thousands of lives and destroying millions of dollars' worth of property. In all, an estimated 9.5 million Filipinos were affected.

The storm is said to be one of the most powerful ever recorded, with official reports putting the number of dead at more than 4,000, though the United Nations estimates this could be more. Still, the number of deaths is expected to rise as more and more people remain unaccounted for and more bodies are discovered under the rubble.

Before typhoon Haiyan, known in the Philippines as Yolanda, weakened on its way to Vietnam through the South China Sea, it caused catastrophic damage on the island of Samar (the third-largest Philippines island) and Leyte.



The international community responded swiftly to the disaster, mobilizing food and relief materials.

These were the worst hit areas with roofs torn off buildings, palm trees uprooted and slammed into shops, and cars flung at buildings and hotels with effortless ease, which demonstrated the strength of the storm.

The Mayor of Tacloban, the capital city of the Leyte province, estimated that the death toll in his city alone could amount to about 10,000. The city has about 220,000 inhabitants.

Also surveying the destruction after taking a helicopter flight over the city, US Marine Brig Gen Paul Kennedy said: “I don’t believe there is a single structure that is not destroyed or severely damaged in some way — every single building, every single house.”

In Cebu, the Philippines’ second-largest city and home to around 2.5m people, where thousands of residents had gathered in the gigantic blue-roofed complex for refuge, the destruction was massive, though not of the scale of Samar and Leyte.

Communication was down, airports and harbours were also severely affected. This hampered immediate relief operations and made rescue efforts in the affected areas extremely difficult.

Long used to typhoons (last year, typhoon Bopha swept through the country leaving more than 1,000 dead and about \$1 billion worth of damage in its wake), the government and people of the Philippines were overwhelmed by the intensity of super typhoon Haiyan and the level of devastation it left as it continued its “journey” through neighbouring countries like Vietnam and China.

In the words of Filipino President, Benigno Aquino: “Nobody imagined the magnitude of this super typhoon on us.”

And as his government struggles with attending to

the wounded, burying the dead and cleaning up the affected cities, there is no doubt that it will be a long road to recovery.

Government authorities were initially overwhelmed by the force of the storm, but the international community has responded swiftly, stepping up aid efforts, mobilizing food and relief materials, as well as providing body bags, all to assist the country in its moment of need.

So far, help and pledges have poured into Manila from countries across the globe. Such aid has come in the form of search and rescue personnel, rapid response teams, airmobile hospitals, the provision of drinking water and water and sanitation equipment, as well as troops and civilian personnel to assist in maintaining law and order and the distribution of needed supplies.

Countries helping include OPEC Members, Saudi Arabia and the United Arab Emirates (UAE). Assistance has also come from Australia (also just recovering from the fire that razed a large part of suburban Sydney), Belgium, Canada, Chile, Denmark, Germany, Hungary, Indonesia, Israel, Japan, Malaysia, the Netherlands, Norway, Russia, Singapore, Spain, Sweden, Taiwan, Turkey, the United Kingdom, and the US. The European Union, the United Nations, as well as the Vatican, have also pitched in to assist with financial aid, as has the Association of Southeast Asian Nations (ASEAN).

“This place used to be so beautiful,” said Aurora de los Reyes, a civil servant in Guiuan — one of the hardest hit areas — who survived the storm, as she surveyed the first shipments of aid coming into the town by military plane.

“The day after the storm hit, I walked from my house to the municipal hall and just cried the whole way, seeing all the destruction,” she added.

Super typhoon Haiyan — the Philippines’ 25th typhoon this year — was the 30th named storm of the 2013 Pacific typhoon season. It originated from an area of low pressure several hundred km east-southeast of Pohnpei in the Federated States of Micronesia on November 2.



Saudi Arabia to boost output at two major fields



Khalid Al-Falih, Chief Executive Officer, Saudi Aramco.

Saudi Aramco is planning to boost the production of light sour crude from two of the Kingdom's giant oil fields — Shaybah and Khurais — by 550,000 barrels/day in 2016-17, according to its Chief Executive Officer, Khalid Al-Falih.

Speaking to reporters in South Korea, where he was attending the World Energy Congress, he said the move was aimed at rebalancing Saudi Arabia's "crude slate", as well as to extend the lifespan of domestic mature fields.

He pointed out that the expansion of the fields in question would start up within a few months of each other.

Shaybah would be the first, said Al-Falih. The expansion scheme would increase the field's output to around one million barrels (per day). An ongoing project at this field would add production of 250,000 b/d of natural gas liquids by the end of next year.

He noted that the Khurais expansion project was intended to increase the field's output by 300,000 b/d to 1.5m b/d.

Production starts 2017

In September, Saudi Aramco awarded the front-end engineering and design (FEED) contract for the Khurais expansion project to Foster Wheeler. With an estimated capital expenditure budget of \$3 billion, Saudi Aramco is expecting the FEED conclusion on the field in 2014 for an effective production start in 2017.

Foster Wheeler previously carried out the FEED of the first development phase in Khurais in 2005 and also executed the engineering, procurement and construction (EPC) contract for the Khurais gas central processing facility, which started operations in 2009.

Al-Falih stated that the two expansion projects would "allow us to relax production from the more mature fields and reservoirs and extend them and also to rebalance our crude slate."

Pointing to the Kingdom's major new Manifa oil field, that went onstream earlier this year, he said Saudi Aramco was opting towards more heavy crude.

"We wanted to introduce more extra light crude, a little more light from Khurais, that will basically allow us to match the market's needs, while at the same time having that extended plateau," he was quoted as saying.

Al-Falih explained that in keeping with the expansion projects, the Kingdom's heavy oil from the Manifa field would be used as feedstock for domestic refineries, while the light crude would be exported.

He disclosed that Saudi Arabia was also looking to become a major supplier of refined products to both Europe and Asia over the next five years. This would transpire with the completion of another two refineries, with a capacity of 400,000 b/d, including the latest project at Jizan, which, barring delays, should start up in late 2016 to early 2017.

The Saudi Aramco head pointed out that the national oil company had increased its annual capital budget from \$4bn to \$40bn over the last decade to help secure its goal to become the world's leading integrated energy company.

The Kingdom, he stressed, continued to make massive investments to maintain a spare oil production capacity of more than 2m b/d, adding that Saudi Aramco was working hard to increase the average of its conventional oil recoveries to 70 per cent — more than double the global average.

"Saudi Aramco continues to play a pivotal role. In the past two years alone, we have swung our production by more than 1.5m b/d in order to address market supply imbalances," he added.



OPEC will ensure oil market remains well supplied – UAE Minister



Suhail Mohamed Al Mazrouei, the UAE's Minister of Energy.

OPEC will continue to ensure that the international oil market is well supplied with crude oil, according to Suhail Mohamed Al Mazrouei, Energy Minister of the United Arab Emirates (UAE).

Speaking in early October in South Korea, where he was attending the World Energy Conference, he said that looking at the current circumstances in the oil market, he did not feel OPEC would change its production policy at the December Meeting of the OPEC Conference.

“There is no sign or something that we can tell you today to say we are increasing or decreasing the quota,” the Minister was quoted by Reuters as saying in an interview.

Suitable output level

Al Mazrouei stressed that OPEC’s current production target of 30 million barrels/day was a suitable level for the market and there was no talk of the Organization adjusting that amount at its end-of-year Ministerial talks, due to be held in Vienna on December 4.

“But what is certain is that we will ensure that the market remains well supplied,” he pointed out.

Non-OPEC oil supply was expected to expand by 1.1m b/d in 2013, with higher-than-expected supply coming from the United States, Brazil, Kazakhstan and South Sudan and Sudan. In 2014, non-OPEC oil supply was expected to increase by 1.2m b/d, supported by anticipated growth in the US, Canada, Brazil, and South Sudan and Sudan.


Concerning oil prices, the UAE Minister said that a price of around \$100/b was “fair and sustainable” for producers and did not harm the market. International oil prices have been hovering just above this mark for some time.

Regarding UAE domestic developments, he confirmed that his country produced around 2.8m b/d in September, adding that the UAE’s production capacity was expected to rise to 3.5m b/d by 2017.

This would be achieved through new licences with international oil concerns.

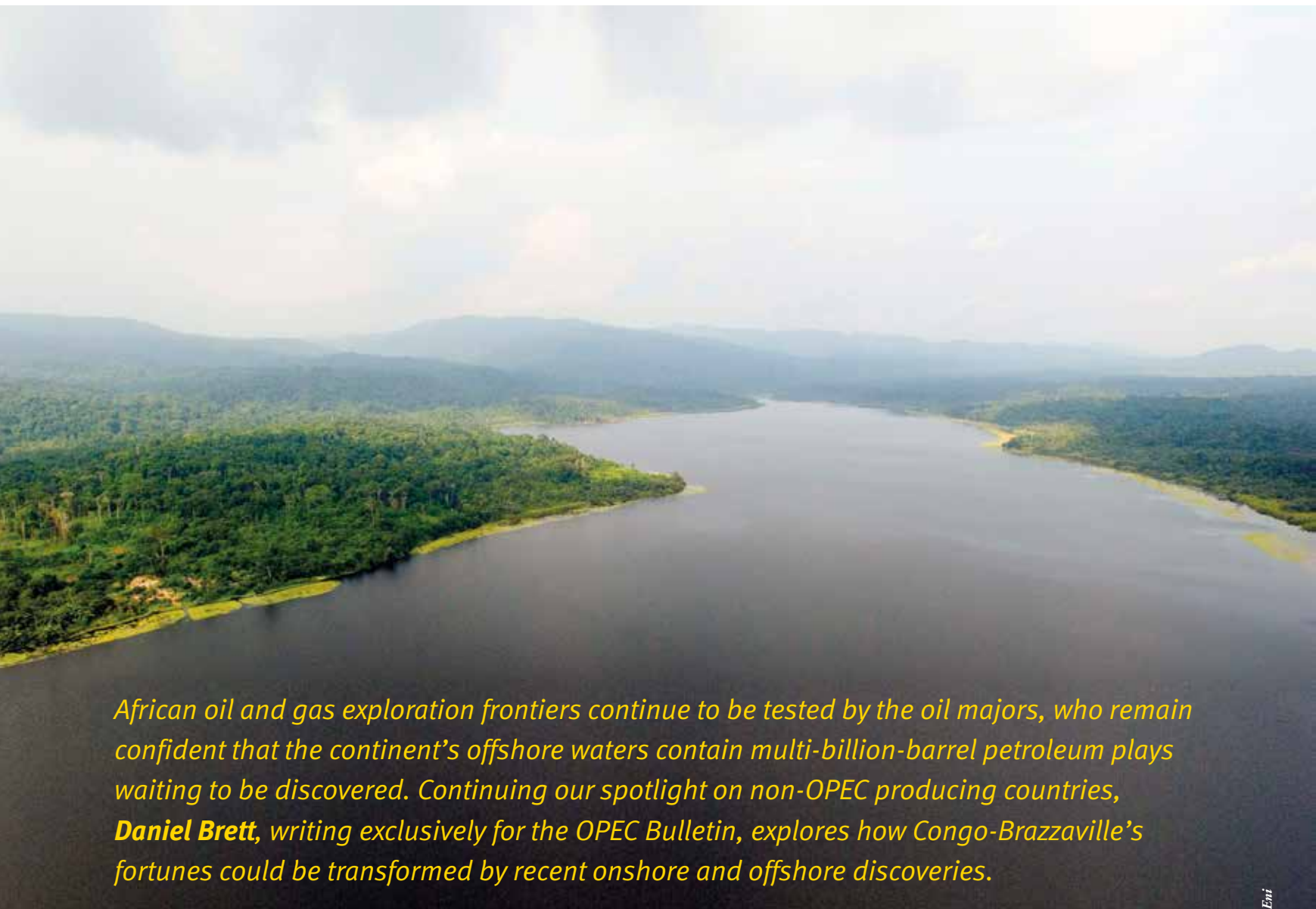
Al Mazrouei explained that the Abu Dhabi National Oil Company (ADNOC) expected to receive bids soon from companies wanting to participate in the concessions run by the Abu Dhabi Company for Onshore Oil Operations, which operated onshore and in the shallow coastal waters of Abu Dhabi.

ADNOC has hinted that it will then take another three or four months to look at the offers, before submitting recommendations to the UAE’s Supreme Petroleum Council (SPC).

ADNOC holds a 60 per cent controlling interest in ADCO, while ExxonMobil, Royal Dutch Shell, Total and BP, each hold shares of 9.5 per cent. 

Steep transitions

Congo-Brazzaville looking to capitalize on frontier oil exploration



*African oil and gas exploration frontiers continue to be tested by the oil majors, who remain confident that the continent's offshore waters contain multi-billion-barrel petroleum plays waiting to be discovered. Continuing our spotlight on non-OPEC producing countries, **Daniel Brett**, writing exclusively for the OPEC Bulletin, explores how Congo-Brazzaville's fortunes could be transformed by recent onshore and offshore discoveries.*

With their eyes on new frontiers of exploration in Africa, oil producers are looking to start new commercial output in Congo-Brazzaville, also known as the Republic of Congo, as soon as next year to reverse the steady decline from mature operating fields.

The nation's oil production — the fourth largest in sub-Saharan Africa — has fallen from its 2010 peak of 312,000 barrels/day to 292,000 b/d in 2012, according to the United States Energy Information Administration (EIA). If that rate of decline continues, by 2020 output could be 20 per cent down from 2010.

The decline is a major concern to the Congo government, which depends on oil revenue for 80 per cent of its income in an economy that lacks an industrial base. Oil represents around two-thirds of gross domestic product (GDP) and 90 per cent of export revenues, data from the World Bank shows. Declining oil output is already impacting economic growth in a country that is struggling with high poverty levels.

With state revenue under threat, the government is encouraging further exploration and development. It will need to add at least 60,000 b/d to production to return to 2010 levels. Pre-salt and oil sands could be major game-changers, but Congo-Brazzaville is not without its risks and difficulties.

Interest of late has been fuelled by recent discoveries and the potential for deepwater prospects. Hopes have been raised by neighbouring Angola, an OPEC Member Country with similar geology, that has shown extremely high prospectivity in its subsalt oil and gas play. Another focus of interest is the onshore Cuvette Basin, which is believed to be rich in oil sands, but faces infrastructural challenges, due to its remote location.

Moho-Bilondo development

France's Total is the country's leading oil producer, accounting for nearly 40 per cent of domestic production, while Eni of Italy comprises approximately a third. Around 40 per cent of exports



are destined for China and 15 per cent are shipped to the US. The Asian market is likely to dominate exports in the future as US imports decline.

Total's planned expansion of Congo-Brazzaville's deepwater oil production will confirm its position as the country's leading oil



Reuters

producer. Total's Moho-Bilondo field hosts Congo-Brazzaville's first deepwater offshore oil production. The field is estimated to hold reserves of some 230 million barrels of oil.

Reaching a plateau production of 90,000 b/d in 2010, it was largely responsible for the peak in output observed that year. Oil is transported

Yves-Louis Darricarrère, President of Total Upstream.



Eni

from a floating production unit via an 80 kilometre pipeline to the Total-operated onshore Djeno export terminal. The company is also operator of the offshore Libondo field (12,000 b/d), which came onstream in 2011.

Total announced in March that it was going ahead with new commercial production at its offshore Moho-Bilondo licence from 2015 with output targeted to reach 140,000 b/d by 2017, boosting national output by nearly 50 per cent over current levels.

Total's new development with its partners, Société Nationale des Pétroles du Congo and Chevron Overseas Congo, will tap reserves estimated at around 485m b and consisting of two projects. Phase one will be tied to the existing floating production unit (FPU) to increase existing production by 40,000 b/d. The other project, Moho

Nord, which is 75 km from Pointe Noire and 25 km west of N'Kossa in water depths of 450-1,200 metres, will be tied to a new FPU where 100,000 b/d will be processed before being piped to Djeno.

Yves-Louis Darricarrère, President of Total Upstream, said: "The development of Moho Nord marks another milestone in Total's long established presence in the Republic of the Congo and leverages our demonstrated expertise in successfully managing major projects, especially in the deep offshore."

However, the \$10 billion development of the Moho-Bilondo licence may be insufficient to offset the continuing decline in the country's mature fields. Congo-Brazzaville will need further major finds to boost production in the future.

Murphy's law

National output has also been supported by Murphy Oil's offshore Azurite project. The field came onstream in August 2009, four years after its discovery in 2005. It was also the first oil project worldwide to employ a floating production, storage and offloading (FPSO) vessel with drilling capability. The FPSO can process 40,000 b/d of crude.

The Azurite field was thought to contain gross reserves of 75m b, but falling oil volumes have prompted Murphy Oil to consider ending production sooner than scheduled. It reportedly informed BW Offshore, the FPSO operator, that the unit could be released before the contract expires in 2016, possibly as soon as 2014.

Oil sands first

After 45 years' presence in Congo-Brazzaville, Eni is the country's leading gas producer and derives most of its output from the 43,000 b/d M'Boundi field, with 37,000 b/d coming from smaller fields. It is looking to become an African first by developing potentially huge oil sands reserves in the Cuvette Basin.

Eni said that "the Cuvette basin, so far little explored, is one of the new themes of frontier exploration in Africa."

In May 2008, Eni signed an agreement for \$3bn of investment in oil sands, palm oil for bio-diesel and electricity in Congo-Brazzaville. The company discovered a large oil sands deposit in 2009 with estimated recoverable reserves of at least 500m b and possibly up to 2.5bn barrels at the Tchikatanga and Tchikatanga-Makola prospects in the Cuvette Basin.

The Italian major became operator of the basin's vast but remote Ngolo Block in the Cuvette Basin in August

2013. The block is approximately 350 km north-east of the capital Brazzaville and covers over 16,000 square km.

With a total development cost of up to \$7.5bn and a peak production of up to 200,000 b/d, Eni hopes to start production as soon as 2014, which would make Congo-Brazzaville the first country in sub-Saharan Africa to exploit this unconventional resource.

Eni is not just concentrating on its onshore oil sands play. The firm also recently announced positive results from two shallow wells in the Nene Marine prospect of its Marine XII Block, in which it has a 65 per cent stake.

“The Cuvette basin, so far little explored, is one of the new themes of frontier exploration in Africa” — Eni

It estimates the discovery to hold around 600m b of oil and 19.6bn cu metres of natural gas in place. Geology is favourable for straight-forward development, although potential production is unlikely to come onstream before 2019 if further appraisals confirm commercial viability.

Elephant-sized gains

Total and Eni may be followed by the China National Offshore Oil Corporation (CNOOC) and its partners in offshore exploration. In September, oil and gas was found at the Elephant Prospect, located in the Haute Mer A licence area, of which CNOOC is the operator.

CNOOC's partner, Canadian independent, Oryx, estimates the discovery to hold around 600m b of oil. Further tests will be conducted in early 2014 as part of a multi-well drilling campaign. The company is planning to sink another well at its Horse prospect in the west of the licence.

Henry Legarre, Oryx Petroleum's Chief Operating Officer, said: “We are very pleased with the Elephant discovery as it represents an important milestone in the building of our West African business. Overall, the results are consistent with expectations. Although subject to testing, the discovery gives us confidence that there is

further upside potential and opportunity to expand the prospect inventory in the license area.”

Others are also joining the race to develop offshore prospects. Chevron is the operator of the Lianzi field, which straddles the border with Angola, although its estimated reserves are small at 80m b of oil. First volumes are due in 2015 with peak production expected to reach a modest 46,000 b/d. Chevron has a 31.25 per cent stake in the concession and partners comprise Total (36.75 per cent), Eni (ten per cent), Sonangol (ten per cent), SNPC (7.5 per cent) and Galp Energia (4.5 per cent).

Future potential

Congo's government is working on plans for a new licensing round that will potentially cover all open acreage, including deepwater licences. The timing depends on finalising the legal framework and the blocks that will be offered, but it could be open as early as the end of 2013.

Interest is likely to be high, due to the discoveries at the Marine XII and Haute Mer A blocks, as well as the pre-salt finds off neighbouring Gabon and Angola. However, excitement will be tempered by the expensive failures of Murphy Oil, which hit dusters in the Mer Profonde Nord block, and the Azurite project that failed to meet expectations. SOCO International also gauged less than hoped for oil rates and gas volumes were very low at the Lideka East Marine-1 in the offshore Marine XI block, according to a September statement.


Meanwhile, Eni is taking a huge gamble with its project to exploit unconventional oil sands in the Cuvette Basin. Only Canada has successfully developed large-scale oil sands production and not without growing controversy over environmental damage.

The company will be keen to avoid the kind of delays facing the Tsimiroro field in Madagascar, which has stalled due to institutional weaknesses, government disputes and a lack of adequate technology.

However, unlike Tsimiroro, the project has full government support, the technology will be easier to finance and Eni could bring in a partner to share the costs. However, environmental concerns abound over the development in the heart of the rainforest and few believe a project of this complexity will be quickly realised.

Gas remains an untapped resource that Congo-Brazzaville could easily utilize to offset maturing oil fields. The country's natural gas resources are estimated at around 90 bcm, the fifth-largest in sub-Saharan Africa, but remain underexploited. Associated gas is mostly flared or reinjected instead of monetized.

A lack of infrastructure prevents the country from producing and consuming significant quantities of gas. Eni has outlined plans to capture gas produced in oil extraction, either for electricity generation, or for reinjection purposes, in an effort to enhance oil extraction. But with no plans for liquefaction facilities, there appears to be little interest in expanding production.

In common with other African exploration frontiers, Congo-Brazzaville's manifold challenges may not be easily overcome. If bountiful resources are confirmed, investment could pay off. But investors are taking a big gamble in this underdeveloped nation. 

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

These pages are dedicated to capturing those visits in pictures.



Above: Wilson Pástor Morris (l), Ecuador's newly appointed Ambassador to Austria, and Governor for OPEC, visited Abdalla Salem El-Badri, OPEC Secretary General, on September 23, 2013.

Below: Sadiq Marafi (l), the newly appointed Ambassador of Kuwait to Austria, visited Abdalla Salem El-Badri, OPEC Secretary General, on October 4, 2013.



Above: Maria Mittermair-Weiss (l), Head of Public Affairs (International and Governmental Relations) at OMV Austria; with a delegation from Libya, Essam Mohamed H Esharif (second left), Reservoir Engineer, Fouad Ali Saleh (second right), Reservoir Engineer, and Mohamed Omar Sak (r), Geologist, visited Abdalla Salem El-Badri (c), OPEC Secretary General, on October 4, 2013.



Above: Dr Karin Kneissl (l), independent energy analyst, author and university teacher in Vienna, visited Abdalla Salem El-Badri, OPEC Secretary General, on October 14, 2013.



Above: Reza Najafi (l), Ambassador, Permanent Representative to United Nations (Vienna), UNIDO and CTBTO, visited Abdalla Salem El-Badri, OPEC Secretary General, on October 16, 2013.



Above: Khaled Abdelrahman Abdellatif Shamaa (l), Ambassador of Egypt to Austria, visited Abdalla Salem El-Badri, OPEC Secretary General, on October 17, 2013.



Chocolate and oil: The ‘seeds’ of success for Venezuela

Venezuela has long been known as a major oil producer and exporter, as well as one of the countries that helped secure oil producers' control over their sovereign wealth through the formation of OPEC in 1960. What is rather less well-known is the South American nation's association with the production of fine chocolate – in fact some of the best quality confectionary produced in the world. **Saúl Castro Gómez** (pictured right), himself a Venezuelan, takes a look at this age-old business which put his country on the global map way before oil became a living and transforming reality.



“People and even some chocolate makers know very little about where their cocoa — eaten or processed — originated.”

It is at the same time loved and avoided. Chocolate — sweet and alluring, dark and mysterious, it serves as a common pick-me-up among the many millions of people who peel off its assorted wrappers every day. Yet, it is also shunned by the figure conscious among us, who may yearn for its exquisite taste, but are too fearful of the high caloric value that comes with each and every bar. Whatever one's position on chocolate is, there is no doubting its many hidden properties. Foremost of these is the ability to instill the feel-good factor into those choosing to savour it. Though happiness may be a subjective or abstract concept, the fact is that one of chocolate's ingredients — tryptophan — is a key amino acid needed in the brain to generate serotonin. This mood-modulating neurotransmitter is basically our 'happy chemical.' Happy or hopeless, in celebrating a variety of intimate moments, individuals the world over embrace chocolate as one of the greatest and most beneficial foodstuffs of all time.

So what is chocolate? Well, it is basically a processed food only made possible because of the beans of the cocoa plant, which Earth and Mother Nature have so kindly afforded humankind among its many other valuable resources. Analogically speaking, in chocolate's creation, one can actually draw parallels with that of crude oil, which also needs a refining process, in order to obtain fuels or products that can be effectively utilized. Cocoa beans also need to undergo their own refining process before the finished chocolate can be consumed. One could say that the skills required for processing cocoa must be as good as those to refine crude oil. And, incidentally, both the oil and cocoa processes can be linked to the do's and don'ts needed for conserving the environment.

What is not an analogy, but rather a simple matter-of-fact, is that Venezuela's singular involvement in the chocolate industry stretches back countless years. Interestingly, in the development of that sweet-making

Chocolate and crude oil, to some extent similar in viscosity and texture, have been interesting subjects in the study of economic history. Interestingly, the biggest certified oil reserves and the best cocoa can be found in Venezuela.



Chocolates El Rey



Chocolates El Rey

Pure criollo, pure Venezuelan ... pure quality to create chocolate. The Cocoa tree (top) bears fruit called pods (above). Inside are the cocoa beans. Brands such as Chocolates El Rey guarantee an excellent bar of chocolate.

process, another “seed of progress” emerged for the country — in the guise of crude oil. One could say, without hyperbole, that one of the planet’s largest oil reserves and the source of one of the world’s greatest luxuries actually lay one above the other — in the same accommodating soil.

There are many furtive stories and countless questions surrounding the origins of chocolate. How was it first used? Who commercialized it for the first time? Where is the best chocolate produced? What are the real effects on one’s health?

The most stereotypical story tells about the encounter between the Aztecs and Hernán Cortés, the Spanish Conquistador, as being accredited with cocoa’s introduction to Europe and consequently to the world. It has been claimed that the cocoa tree and its domestication originated in Mexico, Venezuela and, more recently, in some areas of Colombia and Ecuador.

Whether or not the origin of the legendary tree is something of extreme relevance is debatable, but the absence of chocolate for the masses would certainly undermine a complete visualization of contemporary society, not to mention a case also without crude oil.

And, interestingly, in connection with crude oil, the Global Cocoa Agenda adopted last year in the Côte d’Ivoire

capital, Abidjan, resembled more an energy fora than just the provision of the raw material required for feeding the chocolate industry. In fact, the word “sustainability,” which has been on the lips of most energy commentators over the past few years, proved to be a common denominator.

So, the time is propitious to take a candid look at chocolate and ascertain its connections with an OPEC Founding Member Country better known for petroleum.

Origin and rise

Tandem mass spectrometry (MS²) is a technique used to measure and analyze the molecular mass of a sample. It allows the identification of the elemental composition or unknown compounds in solids, gases or liquids. It has been used, for example, in biotechnology for the analysis of proteins and in the geological field to study oil composition. Anthropologists and archeologists have used the technique to detect, in artifacts, the presence of theobromine in a chemical composition made out of hundreds of compounds, unique in cocoa; therefore in chocolate.

Important studies have shown the presence of theobromine in ancient Olmec pottery, suggesting that cocoa — as a liquid (and not necessarily to drink) — was present in Mexico, circa 1900 BCE. Accordingly, a place and time of its first use is identified with reasonable accuracy.

Nevertheless, other more southern pre-Columbian cultures flourishing between latitude 20° north and 20° south were known too as good potters and cocoa cultivators.

Explorers in the post Descartes period referred to cocoa as the fruit that only grows within these coordinates. Currently, scientists are studying chemical and physical evidence indicating more an Amazonian origin and not Mesoamerican.

What has become known over the centuries is that, in Mesoamerica, cocoa was converted into a sort of fermented beverage consumed mostly among the Mayan and Aztec elite. Of interest, is that these elite, with their obsessive spiritual beliefs, persuaded their followers to build, over a long period of time, massive edifications. The methods of construction utilized required great manpower with vast amounts of rock and ‘wood’ burned, which served as stucco and adobe.

This level of construction, which the Mayans executed increasingly and continuously, led to the significant deforestation of cultivated areas, which left a sour aftermath. No one knows with certainty what caused the fall of a

civilization able to offer important cornerstones for modern astronomy and mathematics.

A hypothesis with a good grade of credibility points to the collapse of their agricultural potential, exacerbated by a lack of ‘water.’ Using this rationale, the Aztecs at the time of Cortés’ arrival must have been required to work hard to undo the chaos caused by their ancestors, the Mayans. In this sense, while cocoa beans were available in the Mesoamerica of the 1500s, the likelihood of a high production volume is debatable.

Cocoa then made its way to Spain. Records from explorers and clerics clearly note the rise in demand for the bean in this country. But it was difficult to attend to and did not happen solely because of the cultivations in Mexico or Central America. On the other hand, without even knowing what the ‘magic’ bean was, pirates with a ‘letter of marque,’ to a considerable extent prevented the introduction of the cocoa bean to the Iberian Peninsula.

But new maritime courses other than Veracruz, along the agricultural merging of other Spanish custodies — and under the ‘captaincy’ of Venezuela — opened up the formal trade of cocoa to make chocolate.

It seems that, in the early 1600s, chocolate existed in the form of an infusion, consumed exclusively in Spain and Spanish-American territories. It received approval from the royals and upper classes, mainly in women. Moreover, researchers have observed in men and women, different behavioral and physiological responses after eating chocolate. In the case of women, chocolate is more likely to reduce appetite. Actually, there is a rumor that chocolate reached France in the hands of a woman — Ana de Austria Estiria of Spain — who married Louis XIII. In one way or another, she exposed the habit of drinking chocolate to French nobility.

Warm chocolate assumed the role as the stimulant beverage in Spain before that of coffee (which has a distinct evolutionary process). During this time, it is possible to imagine missionaries and Jesuits contributing with the recipe’s expansion to France and Italy.

Chocolate became an indulgent beverage that expanded through the social classes and was somewhat popular at the end of the 1600s. Worth mentioning from this period is the Spanish physician, Antonio Colmenero, author of *Chocolata Inda et Natura Chocolatae* (1631). This was possibly the first time that cocoa appeared in a recipe for chocolate and in which its natural properties were underlined. This was many years in advance of Linné’s taxonomic designation for the plant, *Theobroma Cacao*.

The theobroma tree has a range of species, including cocoa, which are used to make chocolate. Its fruits offer three types of bean that, apart from the characteristics of taste, are related to possibly unknown sociocultural events.

These are Forastero, Trinitario and Criollo. Forastero, which means foreigner or intruder, is the ordinary variety cultivated for the mass production of chocolate in present times.

Criollo people coined the name to distinguish it from the Criollo bean, the original version of which came from the coastal areas near the Venezuelan capital, Caracas.

Trinitario, which means Trinitarian, is the result of a hybrid between

Forastero and Criollo trees. A great harvest is thought to have occurred in Trinidad around the 1750s. It is considered fine cocoa.

Finally, the Criollo, which meaning name, taste and historical evolution, is slightly more complicated.

Among producer countries, it is possible to find one or two types of bean. As seen on the island of Java, Indonesia, only a variation of Criollo and Trinitario can be found. The same applies for Ambanja in Madagascar and so on.

The exception is Venezuela, which has been growing the three varieties together for a long time. Interestingly, the inborn cocoa tree planted by 'dame nature' exactly encircle the same areas where petroleum is abundant, whether conventional or heavy crude oil.

Based on its rich aromatics, taste and great commercial value, there were attempts, without success, to replicate the Venezuelan Criollo in places with similar geological characteristics. But for reasons no one quite understands, the flavours always proved to be different.

Today, something similar occurs in the energy sector with shale oil and gas exploration. Poland has one the largest shale gas reserves, but for unclear reasons, 'fracking' there has failed, in extracting methane.

In this respect, what appears to be a typical soil for obtaining cocoa or exploiting hydrocarbons does not completely determine its feasibility. From time to time, for both the chocolate and energy industries, obtaining the main resource for refining the raw products involves a complex task.

The time of the Golden Age

Gold has forever attracted people's attention and commercial activity implying wealth is connected metaphorically with this precious metal. Contrary to what most people think, the phrase and urban myth of 'black gold' was not used for the first time to relate to oil exploitation. In reality, it was first rooted with the cultivation of cocoa in Venezuela.

Cocoa's profit-realizing potential in the making of chocolate attracted Europeans and curious traders from other different parts who were pursuing this new-found 'gold.' Curiously, cocoa was the augury for oil exploitation in Venezuela, the other 'black gold' known universally. As important as these industries were themselves, it is also the implication cocoa had with the concept of political freedom.

The creation of the Antilles on the periphery of the Venezuelan coast enabled the Dutch to participate in and control the cocoa trade.

For Spain, the efficient administration of territories overseas turned out to be difficult. As a countermeasure to economic losses and seeking better legislation, the Spanish Crown implemented changes that later led to the Bourbon Reforms. Charles III and IV of Spain executed these comprehensively upon their colonies in America during the second half of the 1700s.

One firm that greatly benefited from these reforms was the Guipuzcoa Company. With Basque roots, it began its activities in Gipuzkoa, a current province in Spain. It then settled in the Venezuelan port of La Guaira towards the year 1728. More than just a fiscal representative of Spain, it evolved

into a cocoa monopoly of foremost social proportions.

The control over cocoa triggered a rebellion against the Basques that, far from being an isolated skirmish, became a movement that managed to explore the meaning of social classes and political control.

It occurred in 1748, 41 years before the storming of the Bastille. The rebellion was put down under the reign of Ferdinand VI, when leader, Juan Francisco de León, Canarian, a cocoa grower, was imprisoned. The strong social component of the upheaval can be seen as part of the incidents that enlightened Europe and America years later, in which one refers to the notion of a modern republic.

For some reason, and not mere frivolity, only one American name is stamped on the Arc de Triomphe in France — and he is the influential Venezuelan revolutionary, Francisco de Miranda, who ideologically had an impact during the successful liberation of a vast portion of the southern part of America at the time of the Spanish American wars.

To date, cocoa growers in the zone, when referring to the rebellion of 1748, still respond, saying all that happened for a sip of chocolate!

The cocoa bean that caused so much trouble was the Criollo. Regarded as the strangest type of bean, it has a complex taste that evokes tobacco, vanilla, and nut. It emerged as the prevalent category of cocoa that dominated the market for almost three centuries.

If the parallelism is made, it can be said that it was what conventional crude was for the oil companies at oil's dawn — available in great quantities. The most famous Criollo comes from a village called Chuao, located in the northern centre of Venezuela.

The author of *Chocolate Connoisseur*, Chloé Doutre-Roussel, an international authority on high-class chocolate, defines Chuao as "one of the jewels of the earth."

She describes it as having a natural ecological design. Reared in a microclimate, with adequate irrigation, it represents the *crème de la crème* when it comes to cocoa crops. The growing temperature is kept between 23°C and 32°C the whole year round. A few degrees above or below these values could jeopardize the crop.

Some of the most acclaimed variety of Criollo includes Ocumare, which has been used, for instance, by Dumori in creating Puertofino 70 per cent, a chocolate bar possessing the unique tasting experience of nuts, mushrooms and berry.

Patrice Chapon, a former ice cream maker for the Royal Court at Buckingham and now owner of a chocolate firm,

also uses Criollo Ocumare for his creations, including the bar Venezuela 82 per cent, a sober sample of nutmeg and cinnamon.

French luxury sweet manufacturer, Ladurée, which always thinks twice before adding something to its emblematic macarons, relies on Criollo to gain a more natural single-origin product. Licorice macarons and macarons with Venezuelan chocolate from Ladurée have started to relish great popularity in countries like Sweden, where a ‘fika’ — to take a break with coffee or tea — is always a good social activity, especially if it comes with something sweet to eat.

There are Criollo trees in Western Venezuela, not so far away from the city of Maracaibo. The brand, Valrhona, which runs the chocolate and pastry school for chefs, Ecole du Grand Chocolat, includes in its vintage collection, the Palmira 64 per cent, a bar with a hint of spice made with cocoa from these western plantations.

Maracaibo is famous for its basin that catapulted the country into a main exporter of conventional crude oil. It is also the name of an appealing confection produced under the guidance of Martin Isaksson at Chokladfabriken in Sweden.

And when tourists visit Belgium, a country long associated with chocolate, they will find some chocolate boutiques presenting Maracaibo as their delicatessen.

Without question, another fabled Criollo is the grander Porcelana whose name is derived from a ‘white’ bean — translucent and as delicate as a piece of porcelain.

The Italian chocolatier, Amedei, produces a limited version of Amedei Porcelana, a bar of dark chocolate that has been bestowed important culinary awards, such as ‘best bean to bar,’ among others.

Expensive desserts have been made with Porcelana, including the world’s most costly cupcakes. There is also the Golden Opulence Sundae, valued at \$1,000. Depending on price fluctuations, that is around the cost of nine or ten barrels of crude oil.

Just as with crude oil, Criollo and cocoa have become inherent words in Venezuelan idiosyncrasy and, over time, have acquired a peculiar semantic progression.

Criollo actually means “to breed.” In the context of chocolate, this means “pure Venezuelan,” while framed within a more general context, it means “pure American with Spanish lineage.” Still, Venezuelan and American are terms intrinsically related in both content and action. Beyond disputes over conceptualization, if there is any, the ethnonym is fascinating.

The Criollos became an influential social class which



Cocoa beans and the powder that is processed from them.

owned and experimented with large plantations of cocoa in central coastal Venezuela. Eventually, they excelled in other areas, such as Letters and Law, as the case may be with Andrés Bello, the modernizer of the Napoleonic code.

Different things can be regarded as Criollo. For instance, the reliable horse of the Venezuelan cowboy, *llanero*, is Criollo. A baseball player in the major leagues with a high batting average is Criollo, and so forth.

As the renowned French pâtissier, Pierre Hermé, puts it, the Criollo of Chuao might, in fact, be the world's greatest chocolate. Similarly, the expression *un gran cacao* — a great cocoa — is used to denote achievements and expertise in a field of knowledge, or to equate with a VIP.

In 1960, when Venezuela's Juan Pablo Pérez Alfonso met with leaders of the Arab League to set the strategic guidelines for oil-producer countries for the benefit of the global economy — the lead-up to the formation of OPEC — Venezuelans referred to the people involved in these talks as “the great cocoas.”

But not everything about Criollo concerns fine chocolate. The eastern region of Paria in Venezuela, a place that Columbus formerly called the “land of grace”, witnessed special cocoa cultivation. Policies carried out in France under Napoleon III, the “bendiguet,” such as excessive allocation of the labor force for infrastructure development and the mismanagement of free trade, were in detriment to agricultural production.

These developments, combined with other demographic constraints, led to large emigrations overseas from the traditional agrarian constituencies in the 1800s.

Corsica, well known for one of its sons, Napoleon Bonaparte, played a part in the chocolate industry's expansion when Corsican ventures arrived in Paria and joined efforts with Venezuelan cocoa growers.

With the subsequent good fortune that arrived in this inclusive community, the Corsicans found good settlements in the towns of Carúpano and Río Caribe. The newcomers and locals cooperated well together and went on to produce the finest Trinitario.

This episode in the history of chocolate is crucial because it occurred during a period when the methods to generate chocolate in its most current form took place.

It can be said that the Paria and the Barlovento zones functioned as the “tasting room” to master the Broma and Dutch processes. The first process was used to remove the butter from the bean to attain cocoa powder by means of high temperature. The second one used a hydraulic press to remove fat, in order to treat the powder with an alkalizing agent. In this way, the strong taste and colour could be altered.

Chocolate is now not only one of the oldest beverages, but also solids, in the shape of a bar or bonbon. Monarchs of the 1800s loyal to the great Victorian extravaganza did not take any solid concoctions unless they were made with Venezuelan cocoa.

One chocolate catalogued as the proper finishing of cocoa with cinnamon, that hints of vanilla and orange, is ‘Concepcion,’ by chocolatier, Michel Cluizel. It uses Carenero, the highly regarded variation of the Trinitarian bean from Paria and Barlovento. Carenero Superior and Rio Caribe are the

“must” variations to produce an excellent bar of chocolate with a dry texture.

The sort of joint venture seen between Venezuela and France on behalf of chocolate is a good example of the exchange of ideas for making progress.

At the end of the 1800s, as a consequence of cocoa's exploitation, businesses were positively affected in Eastern Venezuela and cities such as Marseille. A submarine cable connected the region of Paria with the South of France and cocoa and other commodities proved positive for the French in implementing mass production innovations, an area a bit behind England during the times of the Industrial Revolution.

From Criollos to Trinitarios and even Forasteros, a wide range of individual chocolates and high-quality pure chocolate bars are possible. The chic chocolatier, La Maison Du Chocolat, has sold in Tokyo or during the Cannes Film Festival one of the best 100 per cent pure chocolate bars. It is renowned among experts to be a full satiating experience. The name is Coro 100 per cent, as Venezuelan as a flag with ‘primary colors’, or the papaya dessert from the grandmothers.

People and even some chocolate makers know very little about where their cocoa — eaten or processed — originated.

Without ignoring the cultural value of places like Paris, Brussels and Zurich, has anyone seen a single-origin chocolate bar with these names? The answer is no, simply because the best chocolate does not come from there.

Presently, among some outstanding Venezuelan chocolate makers is Chuao Chocolatier, voted best chocolate in the United States (www.chuaochocolatier.com and *el Rey*, the ‘king’ www.chocolates-elrey.com). The knowledge, commitment and obviously a direct contact with plantations led to *el Rey* exhibiting this crown.

Information published by the Harvard Business Review, Professor Rohit Deshpande, in explaining marketing strategies, mentions the Venezuelan chocolate paradox. Despite singular characteristics, people do not normally associate Venezuela with chocolate.

Things Fall Apart

Paraphrasing Chinua Acheve's celebrated novel, *Things Fall Apart*, matters reached a particular turning point in Venezuela that affected both the worldwide course of cocoa production, on the one hand, and the oil sector, on the other.

On December 14, 1922, a blowout occurred in Barroso II. Barroso II, or R4, were the names given to an oil well that operated in the vicinity of Maracaibo. For several days, an oil stream visible from many kilometers away produced an unusual crude flow. Its estimation, based on measurements of the epoch, exceeded 18,000 cubic metres daily, which made it one of the greatest oil gushers ever recorded.

Literally, a rain of oil covered people and plantations and with it a new economic era began to emerge in the country. News of the natural phenomenon occupied the international press, but more notably the region's energy potential spread out. Consequently, investments coupled with new job opportunities, initiated a new social drawing of the society of Criollos.

More oil wells became the order of the day and these apparent signals of prosperity progressively created in the Venezuelan nation an internal migratory scheme from rural to "planted" areas (with crude oil).

The positive effects of Barroso II were not only felt in Venezuela, but also in countries such as the US, particularly in 1929 and the subsequent years of the Wall Street Crash. Obvious to mention, the assistance to the inchoate fuel-powered transportation sector was essential.

According to certain views, some type of 'Dutch disease' started to take place. For others, with surprise and gratitude, the country was meant to occupy a role in history as a major player in the energy sector.

In any case, the pros and cons that emerged as a consequence of the exploitation of oil at any given period would require more comprehensive sociological analyses.

What remains certain is that, by the time petroleum became a major commodity in the country, the Venezuelan legacy to the industry of chocolate was already clear.

Since the very genesis of cocoa trade until roughly the 1870s, more than 60 per cent of the cocoa consumed in the world has been produced in Venezuela.

The petroleum era arrived in the country just in time for the rise of cocoa production in Africa. For historiographical purposes, it might be useful to recall that it was not until the very late 1800s that cocoa eventually reached African soil.

Criollo people and the Portuguese introduced the seeds of Forastero as being more disease-resistant in Fernando Po (today Equatorial Guinea) and the only Spanish-speaking country in Africa.

The Ghanaian, Tetteh Quarshie, is commonly credited with cocoa's business expansion in West Africa.

Centuries-old traditions of harvesting and preparing

cocoa were taught and made available to countries, so that they could make good chocolate. The *grandes cacaos venezolanos* — countless women and men — proved to be a guarantee to the likes of Van Houten, Fry & Sons and Nestlé, in terms of providing valuable raw materials and knowledge. And when quantity overcame quality, the distinction between candies and 'real chocolate' became somehow confusing.

The Venezuelans made it clear that cocoa should shine when mixed with other ingredients, especially sugar, milk powder and additives. In other words, it was always a 'sweet' occupation, but not always easy.

Nowadays, West Africa shelters nearly three-quarters of the global crop of cocoa. Today, cocoa production in Venezuela accounts for a very small percentage globally; yet the figure remains the treasure for haute patisserie.

Countries like Nigeria and Ecuador are recognized for their high production volume and great quality.

Intriguingly, both cocoa and oil are devious statistically. There are discrepancies in numbers as to global production and consumption, according to different sources.

Chocolate, oil and important historical events are interrelated in a way that could strike at people's imaginations. Space is limited to say it all in one article.

But what is good to keep in mind is that chocolate and oil should be seen as social unifiers of cultures, surely in a manner for individuals to discover serendipity.

When abroad, Venezuelans are frequently provoked at different social occasions with questions such as, what will Venezuela do once the oil runs out?

While not a realistic scenario at the present time, or even the foreseeable future, if one takes into account the fact that oil fuels the world's economy, Venezuelans can probably only imagine what will happen when that day comes.

In any case, the other question Venezuelans ask themselves is, would it be possible for others to make such good chocolate? ❄️





OFID launches annual information programme



OPEC Secretary General, Abdalla Salem El-Badri (eighth right), and Zoreli Figueroa (seventh right), OPEC's PR Coordinator and Officer-in-charge of the PR and Information Department, pictured with OFID officials and MCIP participants during a visit to the OPEC Secretariat.

The OPEC Fund for International Development (OFID) has launched an annual information programme aimed at strengthening communication with Member Countries and increasing awareness of the institution's achievements, aims and aspirations.

Around 20 officials from the Vienna-based institution's Member Countries attended the inaugural event, which took place in the Austrian capital over four days towards the end of October.

Approved by OFID's Governing Board in March this year, the OFID Member Country Information Programme (MCIP) specifically targets early to mid-career officials

OPEC Fund for International Development (OFID)

from Member Country finance, information and foreign affairs ministries, as well as embassies and other relevant institutions.

As documentation supporting the initiative points out, the aim of the programme is to give those participating a thorough understanding of OFID — its genesis and evolution; its mission and vision; and its achievements and aspirations.

Main objectives

Importantly, the programme is intended to boost engagement with Member Countries, the key stakeholders of the institution.

It said the MCIP has two main objectives: to build a strong awareness of OFID's overall activities as a developmental finance institution; and to create knowledge of OFID's extensive work on energy poverty.

Member Country employees working within their respective finance, communication/information and foreign ministries are considered important stakeholders, who can provide OFID with long-term visibility and strengthen the relationship with Member Countries.

A similar programme has been successfully run by the OPEC Secretariat since 1999.

Now heading into its 15th year, the OPEC Multi-Disciplinary Training Course (MDTC) each year invites participants, nominated by Member Country energy and oil ministries, to attend a four-day course at its Vienna Headquarters.

During that course, participants are introduced to the Secretariat's work and departments and they also spend

a day at OFID to become familiar with the activities of the sister organization.


In the same manner, OFID also has as part of its programme a visit to the OPEC Secretariat, where, on this first occasion, a presentation on the Organization was given by Zoreli Figueroa, PR Coordinator and Officer-in-charge of the PR and Information Department.

Over the first three days of the MCIP, participants heard presentations from OFID directors and senior officers about the institution's operational and support departments and took part in lively discussions covering the issues of international development, OFID's activities and the institution's work, especially energy poverty alleviation.

Overwhelming success

OFID Director-General, Suleiman J Al-Herbish, who welcomed participants at the start of their deliberations, later, in his closing remarks, stressed the "overwhelming success" of the initiative, stating that he had received positive feedback from participants.

But for the purposes of fine-tuning the programme, he encouraged critical evaluation from the participants so that the programme's content could be improved for future years.

Early suggestions comprise changing the name of the initiative to the Member Country Interaction Programme, to better reflect its synergetic nature, and to also include a wider range of participants, such as partner countries, OFID scholars and other young leaders who have benefited from OFID sponsorship in some way. 



Vacancy announcements

Energy Outlook Coordinator

Within the Research Division, the Energy Studies Department monitors, analyzes and forecasts world energy developments in the medium and long term and reports thereon, in particular; provides in-depth studies and reports on medium to long term energy issues; monitors developments and undertakes specific studies on energy demand and production-related technology and assesses implications for OPEC; identifies and follows up key areas of energy-related emerging technologies and research and development (R&D) and facilitates and supports coordinated planning and implementation of collaborative energy related R&D programmes of OPEC Member Countries; identifies prospects for OPEC participation in major international R&D activities; carries out studies and reports on medium to long term developments in the petroleum industry; provides effective tools for and carries out model based studies for analyses and projections of medium and long term energy supply/demand and downstream simulation; elaborates OPEC Long Term Strategy and monitors, analyzes and reports on relevant national or regional policies, such as fiscal, energy, trade and environmental, and assesses their impacts on energy markets.

Objective of position:

The Energy Outlook Coordinator coordinates research activities related to generating a consistent set of projections on future energy supply and demand levels and ensures coherency in scenarios describing possible developments and outlooks for the global energy scene in general and on petroleum supply in particular. Further, he/she provides substantial contribution on current and expected future oil supply developments to the Outlooks generated by the Secretariat including coordination of building a comprehensive oil supply database and monitoring developments related to shale oil and shale gas supply issues.

Main responsibilities:

- Assists in the identification and initiation of key areas of research to be conducted that will provide inputs and elements for building reference case and scenarios included in World Oil Outlook projections.
- Coordinates research activities leading to generating a consistent set of projections on future energy supply and

demand levels and to ensure coherency in scenarios describing possible developments and outlooks for the global energy scene.

- Coordinates development of a comprehensive oil supply database, together with other RD departments, that serves as the base for supply projections at the global and regional level. This includes current and future supply levels, reserves and resources, costs and decline rates.
- Monitors developments related to petroleum supply in general and in shale oil and shale gas supply in particular.
- Provides substantial contribution on current and expected future oil supply developments to the World Oil Outlook generated by the Secretariat, including detailed analyses to support these expectations.
- Conducts research on specific supply-related issues such as resource base, industry costs and investments, regional analysis, decline rates, upstream technologies etc.
- Carries out any other tasks assigned by the relevant superiors as pertain to his/her background, qualifications and position.

Required competencies and qualifications:

Advanced university degree in engineering, sciences or related field. A minimum of ten years (eight years in case of an advanced degree). Training/specialization: Upstream and downstream petroleum technology; R&D programme planning and implementation. Competencies: Communication skills, analytical skills, presentation skills, interpersonal skills, customer service orientation, initiative and integrity. Language: English.

Status and benefits:

Members of the Secretariat are international employees whose responsibilities are not national but exclusively international. In carrying out their functions they have to demonstrate the personal qualities expected of international employees such as integrity, independence and impartiality. The post is at grade D reporting to the Head of Energy Studies Department. The compensation package, including expatriate benefits, is commensurate with the level of the post.

Applications:

Applicants must be nationals of Member Countries of OPEC and should not be older than 58 years. Applicants are requested to fill out the application form which can be received from their Country's Governor for OPEC. In order for applications to be considered, they must reach the OPEC Secretariat through the relevant Governor not later than **January 9, 2014**, quoting the job code: 5.2.01 (*see www.opec.org – Employment*).



Head, Administration and IT Services Department

Within the Support Services Division, the Administration and IT Services Department coordinates all matters pertaining to administering and providing services to the Secretariat, including managing the building and its offices. It handles office and conference services, travel, documents and visa, communication and logistics, as well as office supplies and documentation, security, safety and parking, and furnishes IT infrastructure facilities and support.

Objective of position:

The Head plans, organizes, coordinates, manages and evaluates the work of Administration and IT Services Department in accordance with the approved medium term and annual work programmes and budget of the Department so as to optimize its support to the Secretariat in achieving its overall objectives.

Main responsibilities:

- Plans, organizes, coordinates, manages and evaluates the work in the Administration and IT Services Department by providing services to the Secretariat relating to: the building, offices and the residence; procurement, office supplies and printing services; travel, hotel, visa arrangements, removal of personal effects, legitimation cards, license plates; logistics for all meetings and entertainment functions; transportation, inter-office mail delivery and kitchen services; security, safety and parking; computer network facilities: e-mail, internet, printing; telecommunication system.
- Works closely with Data Services Department, IT Development, to ensure that adequate hardware and software are implemented for the smooth functioning of their programmes, and Finance and HR Department to liaise the smooth transition of incoming/outgoing staff.
- Ensures full responses to requests by the Conference, the Board of Governors and standing committees for studies and special reports relevant to the work programme of the Department.
- Arranges presentations at relevant OPEC meetings and international forums representing the Secretariat as required.

- Develops and maintains networks with external experts and institutions in fields relating to the work of the Department.
- Keeps the Director of the Support Services Division fully informed on all aspects of the work of the Department, and draws his/her attention to important analyses performed by it.
- Evaluates the performance of the staff of the Department, and recommends to the Director, Support Services Division, staff development, salary increase, promotion and separations as appropriate.
- Ensures that the staff of the Department receive the supervision and guidance necessary to broaden and deepen their skills and continuously improve their performance. Prepares the annual budget for the Department.

Required competencies and qualifications:

- Advanced University degree (PhD preferred) in Business Administration or equivalent subject.
- A minimum of 12 years (ten years in case of a PhD degree) with a minimum of four years in a managerial position, preferably at large national, regional, or international institutions.
- Training/specialization: Office Administration, Computer Facility Scheduling and Operations, Professional Management and Leadership.
- Competencies: Managerial and leadership skills, communication skills, decision making skills, strategic orientation, analytical skills, presentation skills, interpersonal skills, customer service orientation, negotiation skills, initiative and integrity.
- Language: English.

Status and benefits:

Members of the Secretariat are international employees whose responsibilities are not national but exclusively international. In carrying out their functions they have to demonstrate the personal qualities expected of international employees such as integrity, independence and impartiality. The post is at grade B reporting to the Director of the Support Services Division. The compensation package, including expatriate benefits, is commensurate with the level of the post.

Applications:

Applicants must be nationals of Member Countries of OPEC and should not be older than 58 years.

Applicants are requested to fill out the application form which can be received from their Country's Governor for OPEC.

In order for applications to be considered, they must reach the OPEC Secretariat through the relevant Governor not later than **January 6, 2014**, quoting the job code: 10.1.01 (see www.opec.org — *Employment*).



Head, Finance and Human Resources Department

Within the Support Services Division, the Finance and Human Resources Department is to provide services related to managing the human and financial resources of the Organization. The Department is responsible for budgets, accounting and internal control as well as human resources planning and management. The Department comprises two organizational sections: the Finance and Human Resources Sections.

Objective of position:

The Head plans, organizes, coordinates, manages and evaluates the work of the Finance and Human Resources Department in accordance with the work programme and budget of the Department so as to optimize its support to the Secretariat in achieving its overall objectives. The work covers responsibilities of policies, development and management of human resources and of setting up and managing the Secretariat's annual budget.

Main responsibilities:

- Plans, organizes, coordinates, manages and evaluates the work in the Finance and Human Resources Department covering:
 - 1) Human resources planning/forecasting, recruitment/selection, training and development, Performance Management System, policies development, compensation and benefits as well as administration of termination;
 - 2) The annual budget of the Division, Departments and Offices, the control of the expenditures and the preparation of the financial reports;
 - 3) The coordination of the preparation of the Secretariat's annual budget;
 - 4) The enhancement of inter-departmental collaboration and cooperation;
 - 5) Taking appropriate measures to ensure an optimal culture and working climate in the Organization by regularly comparing compensations and benefits in the other Vienna based international and private organizations to keep the Secretariat a competitive employer;
 - 6) The development of staff by arranging/coordinating adequate training programmes.
- Participates in all interview panels as the leading member.
- Ensures full responses to requests by the Conference, the Board of Governors and standing committees for studies and special

reports relevant to the work programme of the Department.

- Arranges presentations at relevant OPEC meetings and international forums representing the Secretariat as required.
- Develops and maintains networks with external experts and institutions in fields relating to the work of the Department.
- Keeps the Director of the Support Services Division fully informed on all aspects of the work of the Department, and draws his/her attention to important analyses performed by it.
- Evaluates the performance of the staff of the Department, and recommends to the Director of the Support Services Division, staff development, salary increase, promotion and separations as appropriate.
- Ensures that the staff of the Department receive the supervision and guidance necessary to broaden and deepen their skills and continuously improve their performance.
- Prepares the annual budget for the Department.

Required competencies and qualifications:

- Advanced University degree (PhD preferred) in Business Administration or equivalent subject.
- A minimum of 12 years (ten years in case of a PhD degree) with a minimum of four years in a managerial position, preferably at large national, regional, or international institutions.
- Training/specialization: Human Resources Management, Financial Management (cost and benefit analysis), Office Administration, Professional Management and Leadership.
- Competencies: Managerial and leadership skills, communication skills, decision making skills, strategic orientation, analytical skills, presentation skills, interpersonal skills, customer service orientation, negotiation skills, initiative and integrity.
- Language: English.

Status and benefits:

Members of the Secretariat are international employees whose responsibilities are not national but exclusively international. In carrying out their functions they have to demonstrate the personal qualities expected of international employees such as integrity, independence and impartiality.

The post is at grade B reporting to the Director of the Support Services Division. The compensation package, including expatriate benefits, is commensurate with the level of the post.

Applications:

Applicants must be nationals of Member Countries of OPEC and should not be older than 58 years.

Applicants are requested to fill out the application form which can be received from their Country's Governor for OPEC.

In order for applications to be considered, they must reach the OPEC Secretariat through the relevant Governor not later than **December 7, 2013**, quoting the job code: 9.1.01 (see www.opec.org — Employment).



Oil product market developments to be mixed over winter months

October 2013

Despite a more positive outlook for the United States and Europe, global oil product markets are expected to come under pressure over the winter season, according to the OPEC Secretariat.

The Organization's Monthly Oil market report (*MOMR*) for October stated that product market developments were expected to continue to vary between the regions.

A combination of sluggish demand and increasing product supplies were likely to dampen margins, leading to lower refinery runs.

In a review of oil product market developments over recent months, the publication's feature article said evidence was pointing towards a mixed performance.

In the US, it observed, improving seasonal product demand had hiked margins since the second quarter and encouraged refineries to increase runs. Refiners had also benefited from competitively-priced regional crude supplies and robust export demand for refined products.

"However, the narrowing Brent-WTI spread has eroded some of the competitive advantage enjoyed by US refiners," it pointed out.

In contrast, said the report, product market sentiment in Europe had remained weak, affected by economic concerns in the region, coupled with limited export opportunities to the US.

"However, hopes for a recovery in product demand have emerged since July, despite margins having been squeezed by the increase in crude prices and ample supplies of light distillates, which have led to reduced refinery runs in the region," commented the article.

It said that, in Asia, light and middle distillate cracks had supported the market in the second quarter, amid healthy fundamentals, due to higher seasonal requirements and a temporary tightness in middle distillate supply.

But this situation reversed over the summer during the lower-demand monsoon season, causing margins to fall into negative territory.

In terms of products, the *MOMR* noted that middle distillates had retained some strength on the back of tightening expectations ahead of the autumn maintenance season.

Both the top and bottom of the barrel had weakened worldwide, due to lacklustre demand amid rising supplies and the end of the driving season in the Atlantic Basin.

"As a result, refinery margins have fallen across the globe, losing more than \$3/barrel since July."

Global refinery throughput had reached a seasonal peak of around 78 million barrels/day in July, to average 77.2m b/d in the third quarter, a gain of 1.1m b/d compared to the same quarter last year.

However, throughput was expected to decline in the fourth quarter due to expectations of weaker margins and the onset of seasonal maintenance, which was estimated to take more than 2m b/d of capacity off-line.

Concerning the outlook for the winter season, the *MOMR* maintained that US diesel demand could show a further recovery on increasing rail and trucking activities, which had kept middle distillate demand at over 3.8m b/d.



In Europe, there had been signs of a slight recovery in economic activities, which may limit the expected decline in demand for transportation fuel.

In addition, the seasonal rise in heating oil requirements should also add support over winter.

In contrast, Asia's contribution to growth in total product demand – one of the key drivers of the market in recent years – had begun to show signs of decelerating.

In addition to typically low demand during the monsoon season, demand growth over the coming months was likely to be affected by the reduction in diesel subsidies in several countries, including Indonesia and Malaysia.

The *MOMR* observed that, moreover, the increasing use of coal and natural gas as substitute fuels for power generation, particularly in Japan and South Korea, had also dented oil product consumption.

At the same time, global product markets were likely to see increasing supply due to additional export volumes, mainly from China and India, as well as Russia, the US and Saudi Arabia.

The middle distillate market in particular was expected to be negatively impacted given the new hydro-cracking capacity coming on line.

OECD oil inventory levels no longer barometer for the market

November 2013

Commercial crude oil inventory levels in the OECD region can no longer serve their traditional role as a barometer to assess the state of the market.

According to the OPEC Secretariat, this development was due to the fact that OECD oil demand, once the powerhouse of the global energy scene, had been in decline over the past few years.

OPEC's Monthly Oil Market Report (MOMR) for November, said that, today, a better picture could be seen by looking at inventories in days of forward demand cover, which viewed stock levels in terms of likely consumption needs in the coming quarters.

The publication noted in its feature article that in days of forward cover, OECD inventories in the third quarter of this year stood at around 58 days.

"This is much higher than in the period prior to the global financial crisis (2003–07) when forward cover averaged around 52.1 days," it observed.

The report said that given that inventories had remained at broadly comparable levels, the underlying decline in OECD oil demand had clearly been the driving force behind the upward trend in days of forward cover.

Moreover, it added, in the case of OECD Europe, stocks in days of forward cover currently stood at very high levels of some 67 days, despite in absolute terms standing 50 million barrels below the latest five-year average.

"In the light of the above, it is clear that OECD commercial oil inventories need to be considered in terms of days of forward cover, rather than absolute levels, in order to reflect likely consumption needs," maintained the MOMR.

It said that, at the same time, accurate and timely non-OECD inventory data had become an increasingly important indicator for assessing global oil market conditions.

The current healthy number of days of forward cover in the OECD, combined with data showing an ongoing expansion in non-OECD stocks, highlighted the fact that the market was well supplied.

The article explained that OECD commercial oil inventories had long served as a key indicator of the state of the world oil market, indicating whether it was tight, or well supplied.

"In recent years, however, shifts in oil consumption patterns in the developed and emerging markets have shown the shortcomings of continuing to solely rely on absolute OECD inventory levels as an indicator of global oil market conditions," observed the MOMR.

In terms of definition, it said, global oil stocks included crude and oil products held in storage tanks, as well as in pipelines and tankers. Some of these stocks were commercial and others were government-owned strategic petroleum reserves (SPR).

While some OECD countries had long been obligated to hold the equivalent of 90 days of net oil imports in their strategic reserves, some non-OECD countries had begun in recent years to develop their own strategic oil stocks, as well as expanding their commercial inventories.

The MOMR pointed out that oil-on-water had played a negligible role in global oil stock developments as the volume of oil stored at sea had remained more or less stable in recent years and at low levels.

Similarly, OECD SPR inventories had also not changed dramatically. Over the last decade, strategic inventories had only been released twice: once in 2005, due to the damage of oil installations in the US Gulf of Mexico from Hurricane Katrina, and a second time in June 2011, following various oil supply disruptions.

The report said that OECD commercial inventories – the largest component of global

oil stocks – were generally characterized by seasonal variations over the course of the year.

The longstanding seasonal pattern of OECD commercial oil stocks typically shows a draw in stocks in the first quarter of the year, followed by builds in the second and third quarters, before ending the year with a draw in the fourth quarter.

It maintained, however, that since the financial crisis in 2008, the traditional seasonality pattern of total OECD commercial oil stocks had become less pronounced. This mainly reflected reduced product demand in the OECD. Taking out seasonal variations, OECD commercial oil stocks had remained relatively stable, averaging around 2,650m b over the last decade.

"One of the most important changes in global stocks in recent years has been the increasing importance of non-OECD inventories."

The MOMR said that this had been driven by the increased need for oil to fill new pipelines, refineries and storage tanks that were being constructed in many developing countries, in addition to expanding commercial stockpiling and the development of strategic reserves.

It said that although actual figures on strategic stock levels in non-OECD countries were not generally available, estimations based on information from companies and ministries in key non-OECD countries, combined with data published by JODI Oil, indicated that, since 2003, inventories had increased by nearly 800m b.

"This considerable build has led to an increase in the share of non-OECD stocks in global inventories from about 20 per cent in 2003 to around 30 per cent currently."

"As a result, monitoring oil inventories in non-OECD countries is now essential to understand developments in global oil stocks," the MOMR affirmed.



The **OPEC Reference Basket** rose for the fourth consecutive month in September, increasing by \$1.21 to average \$108.73/b. Crude oil futures prices began the month with some upward momentum fuelled by supply outages and a spike in geopolitical tensions. However, with the easing of geopolitical concerns, oil prices on both sides of the Atlantic began to drop steadily, shedding some \$8/b. An improvement in supply prospects from the Middle East and North Africa (MENA) region and Sudan, along with assurances by major suppliers and international oil agencies that the market was well-supplied, also dampened the upward pressure on crude oil prices. As the rally in the crude futures market came to end, money managers sharply reduced their record-high net length positions at the end of September. On the New York Mercantile Exchange (NYMEX), the front-month West Texas Intermediate (WTI) contract fell 30¢ to \$106.24/b in September, while Intercontinental Exchange (ICE) Brent improved slightly to average \$111.25/b.

World economic growth for 2013 and 2014 remains unchanged at 2.9 per cent and 3.5 per cent, respectively, although ongoing developments regarding the budget stand-off in the US requires close monitoring. US growth for 2013 has been revised down to 1.6 per cent from 1.7 per cent, while the 2014 forecast remains at 2.5 per cent. The Euro-zone growth forecast for the current year has been revised up to -0.3 per cent from -0.5 per cent and to 0.7 per cent from 0.6 per cent for 2014. Japan's forecast for 2013 has been revised up to 1.9 per cent from 1.7 per cent and growth for 2014 has been revised up to 1.5 per cent from 1.4 per cent. India has been impacted by capital outflows and its 2013 forecast has been lowered to 5.0 per cent and its 2014 forecast reduced to 5.8

per cent. China's growth expectations remain unchanged at 7.6 per cent and 7.7 per cent for 2013 and 2014, respectively.

World oil demand is estimated to average 89.7m b/d in 2013, representing growth of 800,000 b/d compared to the previous year, and unchanged from the previous report. Upward revisions in the OECD Americas and Europe were almost entirely offset by downward adjustments in the OECD Asia Pacific, Other Asia and the FSU. For 2014, growth is expected to increase to around 1.0m b/d to reach 90.8m b/d. Non-OECD countries are projected to lead oil demand growth with 1.2m b/d, while OECD consumption is seen continuing to decline, but at a lower rate of 200,000 b/d.

Non-OPEC oil supply in 2013 is estimated at 54.1m b/d, following an upward revision of 100,000 b/d, representing growth of 1.1m b/d. The upward adjustment was due mainly to higher-than-expected supply from the US, Brazil, Kazakhstan and South Sudan and Sudan. In 2014, non-OPEC oil supply is expected to increase by 1.2m b/d, supported by anticipated growth in the US, Canada, Brazil and South Sudan and Sudan. Output of OPEC NGLs and nonconventional oils is expected to increase by 200,000 b/d in 2013 and 100,000 b/d in 2014. In September, total OPEC crude production averaged 30.05m b/d, according to secondary sources, representing a drop of 390,000 b/d from the previous month.

Oil **product markets** sentiment showed a mixed performance in September. Middle distillates remained relatively healthy on the back of tightening sentiment. In contrast, gasoline plummeted with the winding down of the driving

season in the Atlantic basin, as well as declining seasonal demand in Asian countries. Combined with a weakening fuel oil market sentiment, this caused refinery margins to continue their worldwide downward trend.

Bearish sentiment continued to dominate the crude oil **tanker market** in September, despite VLCCs registering only a slight rate increase from last month. Freight rates remained largely under pressure due mainly to high tonnage availability and limited demand. Suezmax and Aframax freight rates were lower in September due to a lack of tonnage demand. Clean tanker rates were mixed. In September, OPEC spot fixtures rose to average 13.21m b/d, mainly due to increased Middle East-to-East fixtures.

Total **OECD commercial oil stocks** fell by 10.0m b in August to show a deficit of around 68m b with the five-year average, divided between crude and products. In terms of forward cover, OECD commercial stocks stood at 58.6 days, a surplus of 0.1 days compared to the five-year average. Preliminary data for September showed US commercial oil stocks rose by 4.5m b – reversing the drop of the last two months – to indicate a surplus of 33.0m b with the five-year average. This gain was divided between crude and products, which indicated surpluses of 23.7m b and 9.2m b, respectively.

Demand for **OPEC crude** in 2013 is estimated to average 29.9m b/d, unchanged from the previous report, representing a decline of 500,000 b/d from 2012. In 2014, demand for OPEC crude is expected at 29.6m b/d, also in line with the previous report, representing a decline of 300,000 b/d compared to the current year. ■■

The feature article and oil market highlights are taken from OPEC's Monthly Oil Market Report (MOMR) for October 2013. 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.

MOMR oil market highlights ...

November 2013

The **OPEC Reference Basket** declined by \$2.04 to \$106.69/b in October after four consecutive months of gain. All Basket component values moved lower, but by varying degrees. Most components were affected by high crude oil inventories, as refineries entered into autumn seasonal turnaround maintenance and refining margins remained low. Crude oil futures prices on both sides of the Atlantic moved lower in October with ICE Brent lower by \$1.81 at \$109.44/b, while Nymex WTI declined by \$5.68 to \$100.55/b, which widened the Brent-WTI spread to \$8.90/b. Downside pressure came on United States futures, due to the sharp climb in US crude inventories, even as the Federal Reserve left its economic stimulus intact, following the US government shutdown. Easing geopolitical tensions also continued to deflate the risk premium in the market.

World economic growth forecasts for 2013 and 2014 remain unchanged at a moderate level of 2.9 per cent and 3.5 per cent, respectively. The forecast for the OECD continues to assume a recovery in most major economies, leading to growth of 1.9 per cent in 2014, compared with 1.2 per cent in the current year, unchanged from the previous report.

India has been impacted by decelerating investment and capital outflows recently, necessitating a downward revision in its growth figures, which now stand at 4.7 per cent in 2013, compared with 5.0 per cent previously, and 5.6 per cent in 2014 from 5.8 per cent this year. China's recent stimulus efforts and rising exports have led to upwardly revised growth of 7.8 per cent for this year, from 7.6 per cent previously, and to 7.8 per cent next year, from the previous 7.7 per cent. Although the global economy continues to improve, the pace of

growth remains sluggish and near-term developments will need close monitoring.

World oil demand growth in 2013 has been revised up slightly by 34,000 b/d from the previous month's report. This revision is based on actual and preliminary data for the first half of the year, generally coming from all OECD regions, as well as some non-OECD countries, particularly in Africa. World oil demand growth for this year currently stands at 900,000 b/d. For 2014, the forecast for world oil demand growth remains unchanged at 1.04m b/d.

Non-OPEC oil supply in 2013 is estimated to increase by 1.2m b/d, representing a minor upward revision from the previous report. In 2014, non-OPEC oil supply is forecast to also grow by 1.2m b/d, and also slightly higher than the previous month's report.


The US, Canada, Brazil, South Sudan and Sudan, Kazakhstan and Colombia are expected to be the main contributors to next year's growth, while Norway, the United Kingdom, Syria and Mexico are anticipated to see the largest declines. Output of OPEC NGLs and nonconventional oils is seen averaging 5.9m b/d in 2014, indicating growth of 100,000 b/d over the current year. In October, OPEC crude oil production averaged 29.89m b/d, virtually unchanged over the previous month, according to secondary sources.

Product markets exhibited a mixed performance in October. The top of the barrel continued its seasonal weakening, despite some positive signs for naphtha, while middle distillates and fuel oil rebounded worldwide on the back of a slight recovery in demand amid temporary tightening in some regions. Together with

the fall in crude oil prices, this helped product margins to recover.

In the **tanker market**, dirty spot freight rates saw mixed movements in October. VLCC spot freight rates exhibited gains on all reported routes from the previous month. On average, VLCC spot freight rates were 6.0 per cent higher than a month earlier. The increase was mainly driven by winter seasonal demand and increased shipments from the Middle East to Asia. In the clean tanker market, both Suezmax and Aframax freight rates dropped as result of limited tonnage demand, with both East and West of Suez rates falling by 3.0 per cent and 11 per cent, compared with the previous month.

Preliminary data for September shows total **OECD commercial oil stocks** rose by 7.5m b. Inventories continued to show a deficit with the five-year average, now at 33m b, divided between crude and products. In term of forward cover, OECD commercial oil stocks stood at around 58 days in September, 0.1 day more than the five-year average. Preliminary data shows that total US commercial oil stocks fell by 9m b in October, reversing the build of the previous two months, but still showing a surplus of 34m b with the five-year average. The gain was concentrated in crude, which indicated a surplus of 40m b, while products showed a deficit of 7m b.

Demand for **OPEC crude** in 2013 is estimated to average 29.9m b/d, unchanged from the previous report, representing a decline of 600,000 b/d from last year. The forecast for next year was also unchanged at 29.6m b/d, representing a decline of 300,000 b/d, compared with the current year. 

The feature article and oil market highlights are taken from OPEC's Monthly Oil Market Report (MOMR) for November 2013. 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 crude oil prices \$/b

Crude/Member Country	2012			2013									Weeks 40-44/13 (week ending)					
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Oct 4	Oct 11	Oct 18	Oct 25	Nov 1
Arab Light – Saudi Arabia	109.09	108.47	108.35	110.64	113.95	107.61	101.97	101.06	101.30	105.03	108.09	109.48	107.14	106.92	107.87	107.57	106.46	106.48
Basrah Light – Iraq	106.66	105.45	105.04	107.51	110.48	104.17	98.22	98.23	98.94	103.24	106.07	106.61	103.69	103.87	104.76	104.11	102.68	102.70
Bonny Light – Nigeria	113.31	110.91	111.19	115.41	118.69	110.57	105.17	105.83	106.12	110.21	113.62	114.30	112.44	111.91	113.78	113.40	111.16	110.93
Es Sider – Libya	111.41	109.01	109.29	113.01	116.29	108.37	102.22	102.63	103.07	107.91	111.07	111.60	108.74	108.41	110.08	109.70	107.46	107.19
Girassol – Angola	111.00	108.91	108.92	112.24	116.22	109.48	103.84	103.69	104.23	107.55	110.80	112.13	110.20	109.61	111.20	111.00	109.16	109.22
Iran Heavy – IR Iran	108.11	106.80	106.56	108.52	112.24	105.47	99.71	99.72	100.61	103.65	107.06	109.15	107.69	106.37	107.75	108.46	107.74	107.84
Kuwait Export – Kuwait	107.56	106.82	106.19	108.31	111.79	105.17	100.07	99.82	100.22	103.22	106.47	108.02	106.13	105.36	106.50	106.72	105.84	105.94
Marine – Qatar	108.63	107.12	106.25	107.87	110.94	105.36	101.55	100.22	100.20	103.34	106.67	108.15	106.61	105.11	106.66	107.42	106.72	106.85
Merey* – Venezuela	97.50	93.28	91.68	96.99	101.94	98.55	93.84	94.02	95.37	95.68	98.06	97.85	96.80	96.98	96.67	96.97	96.33	96.98
Murban – UAE	111.36	109.69	108.90	110.39	113.92	108.45	104.46	102.83	102.61	105.58	109.18	111.14	110.13	108.23	110.29	111.00	110.26	110.50
Oriente – Ecuador	98.74	97.15	98.68	101.39	103.41	100.86	95.56	96.40	96.01	99.54	98.24	100.43	95.16	97.05	97.41	96.26	92.55	91.59
Saharan Blend – Algeria	111.41	109.36	109.89	114.21	116.99	108.87	102.97	102.83	102.07	107.56	111.87	112.95	111.04	110.52	112.38	112.00	109.76	109.37
OPEC Reference Basket	108.36	106.86	106.55	109.28	112.75	106.44	101.05	100.65	101.03	104.45	107.52	108.73	106.69	106.17	107.32	107.28	106.08	106.14

Table 2: Selected OPEC and non-OPEC spot crude oil prices \$/b

Crude/Member Country	2012			2013									Weeks 40-44/13 (week ending)					
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Oct 4	Oct 11	Oct 18	Oct 25	Nov 1
Minas – Indonesia ¹	111.47	108.26	108.96	116.92	119.62	109.47	101.25	99.11	103.19	103.38	105.55	114.38	106.98	108.53	107.49	107.57	105.95	105.80
Arab Heavy – Saudi Arabia	106.91	106.13	104.79	106.54	110.15	103.16	98.50	98.98	99.64	101.78	105.33	106.72	105.04	103.73	105.04	105.81	105.17	105.40
Brega – Libya	110.89	108.61	108.99	113.01	116.49	108.62	102.67	103.03	103.27	108.11	111.52	112.15	109.29	108.96	110.63	110.25	108.01	107.75
Brent – North Sea	111.61	109.11	109.29	113.01	116.29	108.37	102.17	102.53	102.92	107.96	111.27	111.90	109.04	108.71	110.38	110.00	107.76	107.51
Dubai – UAE	108.80	107.22	106.34	107.94	111.25	105.55	101.68	100.30	100.32	103.52	106.81	108.28	106.70	105.25	106.71	107.48	106.84	106.94
Ekofisk – North Sea	112.49	110.46	110.66	113.67	117.68	110.43	103.53	103.60	103.79	108.77	112.54	113.69	110.28	110.25	111.75	110.97	108.89	108.73
Iran Light – IR Iran	109.60	107.77	107.61	110.38	114.68	108.52	101.27	100.98	101.73	105.54	109.17	110.47	108.19	107.78	109.48	109.14	106.83	107.00
Isthmus – Mexico	104.39	99.37	99.03	106.48	113.44	109.86	105.48	105.48	104.08	109.18	109.09	106.80	99.84	103.25	102.41	100.00	96.75	96.32
Oman – Oman	108.83	107.23	106.34	107.94	111.25	105.56	101.72	100.46	100.35	103.53	106.94	108.56	106.78	105.61	106.78	107.53	106.88	106.98
Suez Mix – Egypt	107.42	105.38	105.35	108.73	111.68	104.23	99.12	99.89	100.13	105.41	108.08	108.36	105.72	105.24	106.88	106.76	104.42	104.60
Urals – Russia	110.26	108.23	108.21	111.62	114.51	107.01	102.06	102.52	102.74	108.06	110.75	110.92	108.28	107.78	109.41	109.31	107.02	107.19
WTI – North America	89.47	86.59	88.23	94.77	95.31	92.87	91.97	94.60	95.74	104.51	106.55	106.26	100.41	102.99	102.53	101.38	97.50	96.85

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).

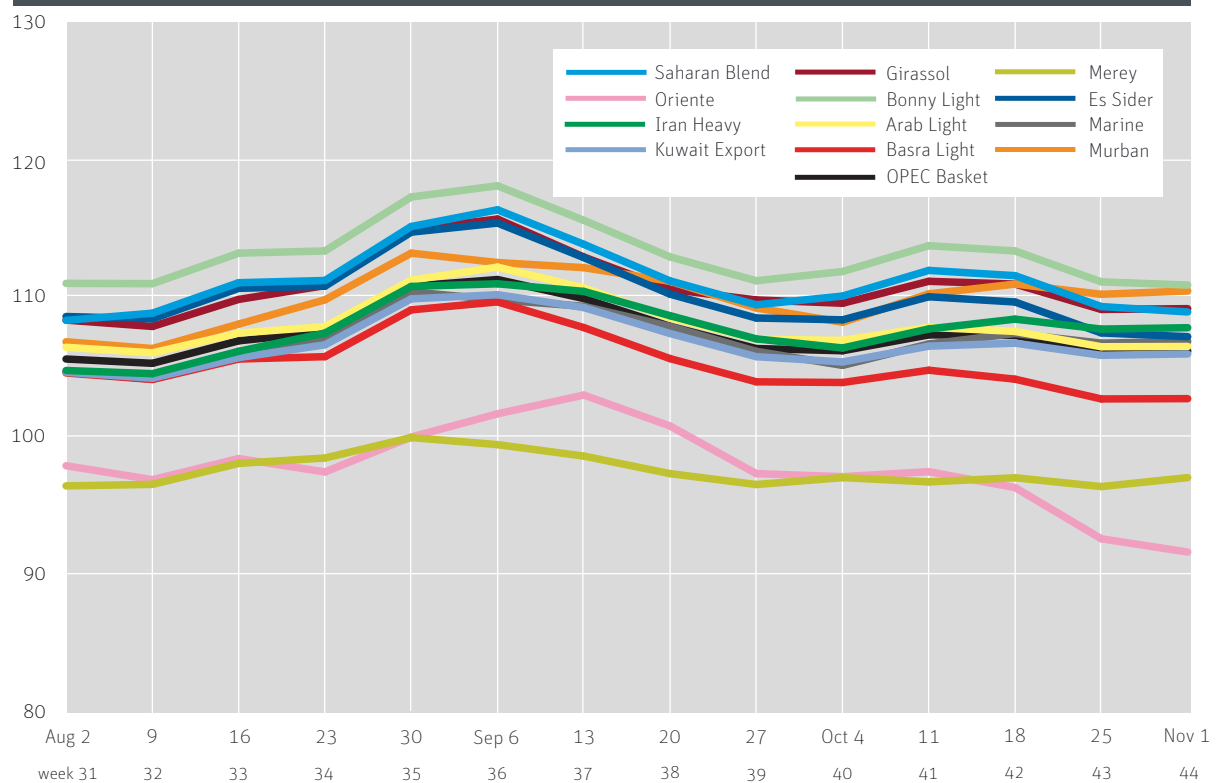
* Upon the request of Venezuela, and as per the approval of the 111th ECB, BCF-17 has been replaced by Merey as of January 2009. The ORB has been revised as of this date.

1. Indonesia suspended its OPEC Membership on December 31, 2008.

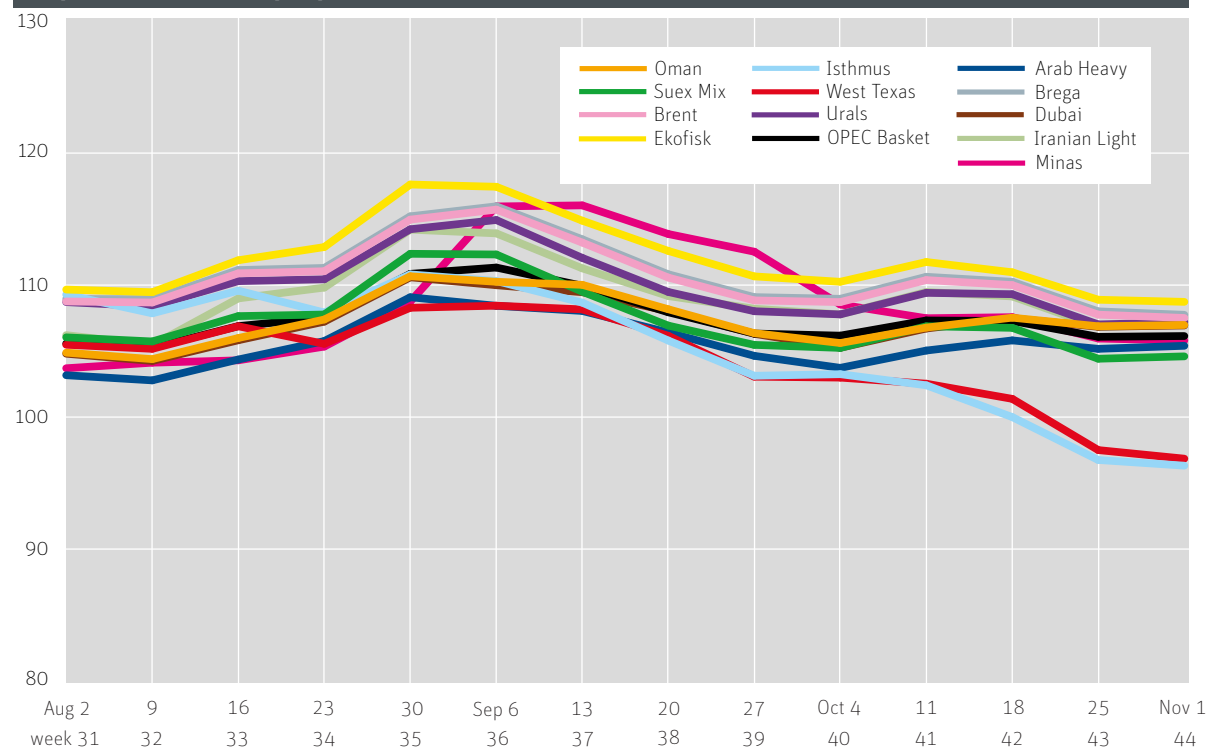
Brent for dated cargoes; Urals cif Mediterranean. All others fob loading port.

Sources: The netback values for TJL price calculations are taken from RVM; Platt's; Secretariat's assessments.

Graph 1: Evolution of the OPEC Reference Basket crudes, 2013 \$/b



Graph 2: Evolution of spot prices for selected non-OPEC crudes, 2013 \$/b



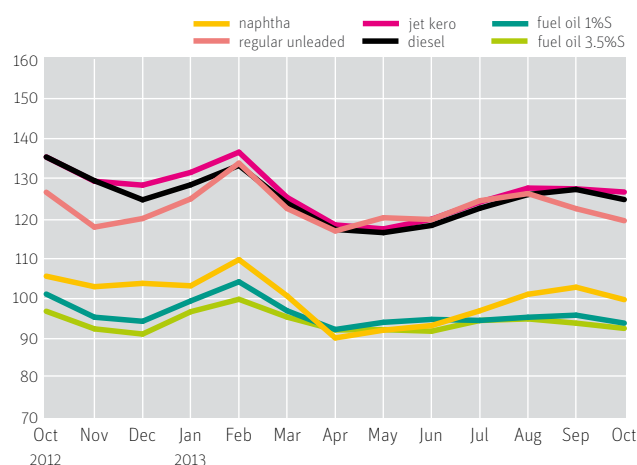
Note: As per the decision of the 109th ECB (held in February 2008), the OPEC Reference Basket (ORB) has been recalculated including the Ecuadorian crude Oriente retroactive as of October 19, 2007. As per the decision of the 108th ECB, the basket has been recalculated including the Angolan crude Girassol, 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).

Upon the request of Venezuela, and as per the approval of the 111th ECB, BCF-17 has been replaced by Merey as of January 2009. The ORB has been revised as of this date.

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
2012						
October	105.62	126.60	135.41	135.41	101.15	96.86
November	103.00	117.89	129.48	129.34	95.37	92.46
December	103.83	120.03	124.71	128.37	94.35	91.16
2013						
January	103.22	124.95	128.47	131.56	99.44	96.75
February	109.76	133.87	133.30	136.61	104.22	99.85
March	100.70	122.54	123.85	125.31	96.98	95.40
April	90.19	116.92	117.31	118.43	92.30	92.19
May	92.13	120.23	116.51	117.44	94.09	92.26
June	93.29	119.78	118.31	119.85	94.82	91.87
July	96.98	124.48	122.60	124.14	94.57	94.55
August	101.10	126.26	126.03	127.64	95.36	94.95
September	102.87	122.50	127.30	127.45	95.88	93.88
October	99.76	119.49	124.77	126.65	93.89	92.58



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
2012					
October	102.58	125.37	132.30	100.56	96.53
November	100.19	117.05	126.05	95.09	90.88
December	100.63	115.73	124.54	93.29	89.86
2013					
January	100.01	121.16	129.18	100.85	95.97
February	106.55	130.68	133.96	104.50	98.87
March	97.68	120.98	122.98	96.03	94.69
April	87.46	116.61	116.12	91.59	90.74
May	89.61	116.33	115.82	94.14	90.75
June	91.01	116.40	117.70	95.54	91.90
July	94.51	121.89	122.76	94.27	93.85
August	98.53	124.28	125.75	95.63	94.35
September	100.74	119.30	126.39	96.39	94.09
October	97.78	114.49	125.15	93.94	92.18

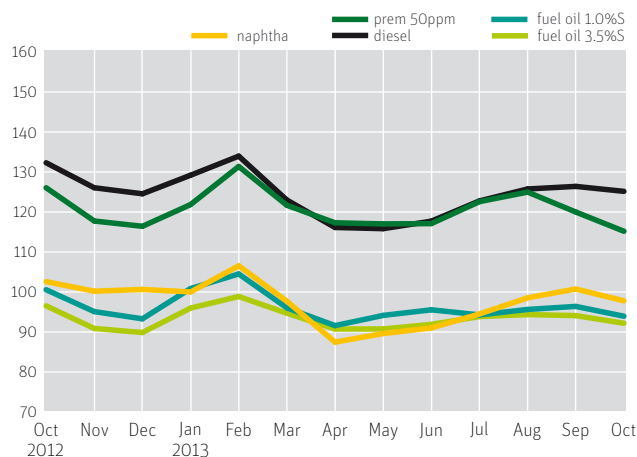
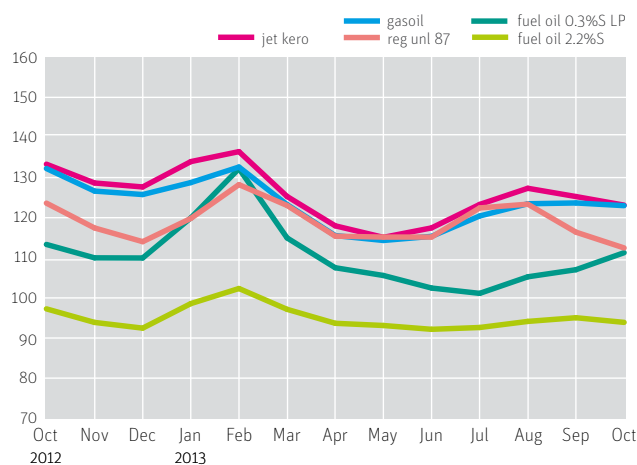


Table and Graph 5: US East Coast market – spot cargoes, New York

\$/b, duties and fees included

	regular gasoline unleaded 87	gasoil	jet kero	fuel oil 0.3 per cent S	fuel oil 2.2 per cent S
2012					
October	123.63	132.26	133.34	113.33	97.27
November	117.44	126.63	128.65	109.99	93.89
December	114.02	125.77	127.66	109.95	92.46
2013					
January	119.81	128.75	133.98	119.94	98.58
February	128.24	132.63	136.47	132.23	102.34
March	123.04	123.26	125.29	114.95	97.15
April	115.39	115.54	117.97	107.52	93.67
May	115.16	114.32	115.10	105.59	93.12
June	115.17	115.34	117.45	102.46	92.17
July	122.43	120.42	123.30	101.13	92.62
August	123.37	123.47	127.33	105.26	94.14
September	116.39	123.67	125.27	107.03	95.06
October	112.46	123.00	123.13	111.27	93.90



Source: Platts. Prices are average of available days.

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

\$/b

	naphtha	gasoil	jet kero	fuel oil 2 per cent S	fuel oil 2.8 per cent S
2012					
October	108.35	131.39	131.77	94.27	92.19
November	108.52	125.15	125.88	90.89	89.02
December	110.27	124.86	125.49	89.46	87.80
2013					
January	113.55	128.12	131.81	95.58	92.82
February	127.69	133.53	136.72	99.34	96.50
March	119.80	123.60	125.96	94.15	91.25
April	97.11	116.33	119.14	90.67	87.48
May	93.77	115.81	116.04	90.12	86.64
June	88.24	117.61	117.88	89.26	84.81
July	105.97	121.79	123.23	90.10	85.10
August	107.39	125.58	127.83	91.94	86.94
September	106.06	124.68	124.38	94.10	89.10
October	104.98	123.37	122.88	91.43	86.43

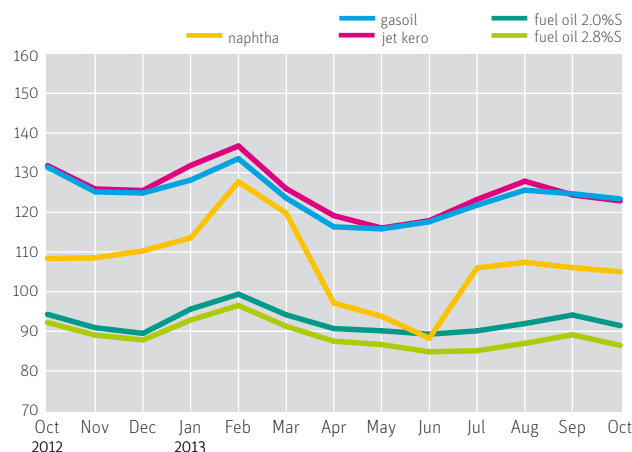


Table and Graph 7: Singapore market – spot cargoes, fob

\$/b

	naphtha	premium gasoline unl 95	premium gasoline unl 92	gasoil	jet kero	fuel oil 180 Cst	fuel oil 380 Cst
2012							
October	104.91	124.07	120.42	129.85	130.17	102.19	99.89
November	102.64	119.61	116.47	125.69	125.21	97.48	94.59
December	103.21	118.85	115.89	125.07	124.75	96.74	94.20
2013							
January	105.55	122.77	120.07	127.01	128.09	99.53	98.48
February	111.89	132.98	129.78	132.75	133.77	102.05	101.44
March	102.09	124.00	120.78	123.64	123.50	99.53	98.49
April	93.43	113.95	110.77	116.77	116.20	96.42	95.45
May	93.56	114.40	111.08	116.72	115.37	95.87	94.19
June	94.16	117.85	114.75	119.28	116.75	96.81	93.38
July	97.70	121.73	118.79	123.14	121.18	95.23	93.15
August	101.01	117.11	114.67	124.14	124.73	97.82	94.46
September	102.76	117.31	114.28	123.57	123.87	96.30	94.48
October	100.20	114.36	111.60	123.89	123.08	96.88	95.69

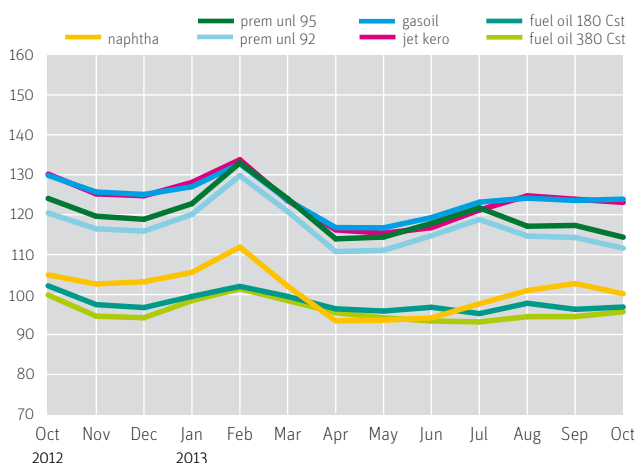
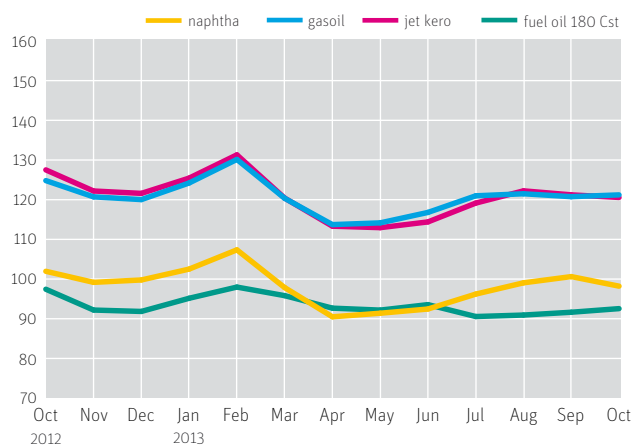


Table and Graph 8: Middle East Gulf market – spot cargoes, fob

\$/b

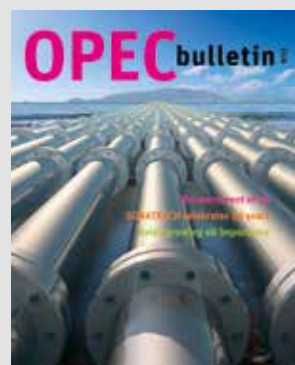
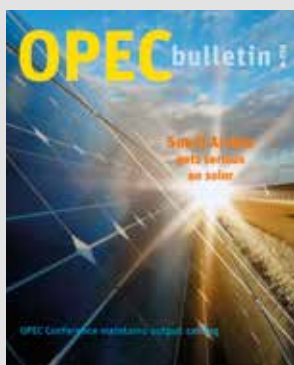
	naphtha	gasoil	jet kero	fuel oil 180 Cst
2012				
October	101.96	124.81	127.51	97.44
November	99.17	120.71	122.19	92.19
December	99.77	120.02	121.59	91.84
2013				
January	102.51	124.21	125.44	95.16
February	107.36	130.14	131.30	97.98
March	97.85	120.35	120.40	95.82
April	90.49	113.72	113.32	92.67
May	91.39	114.16	112.95	92.18
June	92.45	116.79	114.40	93.56
July	96.21	120.98	119.14	90.56
August	99.05	121.49	122.23	90.93
September	100.62	120.76	121.22	91.64
October	98.21	121.21	120.56	92.55



Source: Platts. Prices are average of available days.

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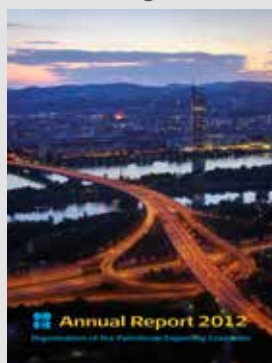
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