Venezuela celebrates 100 years of oil activity
6th International Seminar

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Counting the cost of speculation

If there is one thing that OPEC has learned over its long and eventful history it is that one cannot afford to treat the international oil market with complacency. Do so at your peril. Of all the commodities traded on global exchanges each and every day, oil is perhaps the one that attracts the most interest and attention.

From government offices to specialist media houses the world over, all eyes are on the daily ticker bringing the latest information on the price of crude oil. Little wonder some refer to it as 'black gold'. It might not glitter in its crude form, but oil is undeniably precious. It is in high demand every day of the year and that is something that will remain for the foreseeable future. In fact, all reliable forecasts show that oil's importance to the global economy will only heighten in the years ahead.

That is why whenever there is any marked change in the price of crude on the various energy exchanges, the alarm bells start to ring — particularly among the producers and consumers, both of which have vested interests, albeit different, in maintaining a certain price range.

As anyone involved in commodity trading will tell you, mild movements in prices are a healthy and accepted part of proceedings: some days the bulls win, some days the bears, but usually the highs and lows eventually balance out.

But when that volatility becomes extreme, with wild and uncontrollable swings, then it takes on a whole different story. The very fabric of the trading structure comes under threat. Under this type of scenario, there are no winners — apart from the unscrupulous speculators that cause it, of course.

The fact is, OPEC has been having to deal with speculation for most of its existence. Since the summer of last year, the price of OPEC’s Reference Basket of crudes — a valuable barometer on international pricing — has averaged around a steady $105/barrel. This has been acceptable to all parties associated with the oil sector — the producers, the consumers, and the oil companies alike. But most importantly, prices have remained relatively steady, with limited volatility, meaning that the stakeholders could plan accordingly.

However, in the last few months, prices have slumped — in fact they are now some $10/b lower than in July. And according to the OPEC Secretariat, the actions of speculators are again behind much of the price decline. The Organization’s Monthly Oil Market Report (MOMR) for September observed that, interestingly, these individuals are the same ones that sent prices to new highs earlier in the summer.

The report noted that speculators operating in the two main crude oil futures contracts reduced their net long positions by nearly 50 per cent in August, exerting significant downward pressure on prices over the month. It noted that, over a two-month span, as prices plunged by over $10/b, hedge fund and other money managers trimmed their net long positions by a hefty 73 per cent and 45 per cent in ICE Brent and Nymex WTI futures, respectively.

Their actions left the respective positions at their lowest level in almost two years. This is indicative of the kind of speculation oil markets have had to suffer in recent times, action that not only destabilizes trading patterns, but creates great uncertainty. This, in turn, makes it difficult to plan, going forward.

Seemingly, lessons have been learned. Since the financial crisis in 2008, there have been moves among regulators to at least limit the extent of the speculation seen on global exchanges. This is a good development. But unfortunately, where there are quick gains to be made, speculation will always be a feature in commodity trading, especially in oil.

OPEC’s position on the oil market has always been one of responsibility, continually searching for the stability and continuity that enables economies to run smoothly and prosper. Yet, it cannot tackle all the problems alone, nor should it be expected to.

The Organization needs the help of all other stakeholders — for them to show the same level of commitment, especially in such challenging times. A multilateral world quite simply requires a multilateral approach with all parties pulling in the same direction.

Unilateral actions borne out of self-interest are not only unhelpful, but risk placing us all on a slippery slope.
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Cover
This month’s cover shows a statue that reflects Venezuela’s oil history. It is located in front of the Venezuelan Energy Ministry building in Caracas (see feature on the country’s oil anniversary on page 6).

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.

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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### Editorial staff  
- **Editor-in-Chief**: Hasan A Hafidh Hamid  
- **Editor**: Jerry Hayliins  
- **Associate Editors**: James Griffin, Alvino-Mario Fantini, Maureen MacNeill, Scott Laury  
- **Production**: Diana Lavnick  
- **Design & Layout**: Carola Bayer and Tara Starnegg  
- **Photographs** (unless otherwise credited): Diana Golpashin and Wolfgang Hammer  

**Distribution**: Mahid Al-Saigh  

Indexed and abstracted in PAIS International  

**Contributions**  
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Saudi Aramco plans to invest $40 billion a year over the next decade to maintain its crude oil production capacity, while diversifying its business portfolio, according to the national energy company’s President and Chief Executive Officer, Khalid Al-Falih.

Addressing the Offshore Northern Seas (ONS) Conference in Stavanger, Norway, in August, he revealed that the investment programme was also aimed at doubling the Kingdom’s output of natural gas.

“Although our investments will span the value chain, the bulk will be in upstream and increasingly from offshore, with the aim of maintaining our maximum sustained oil production capacity at 12 million barrels/day, while also doubling our gas production,” he told assembled delegates.

“This will ensure that we efficiently meet the Kingdom’s rising energy demand with gas for power and industry and refined products for transport, while also meeting the global call on our crude oil,” he stated.

Al-Falih warned that rising oil-sector costs and global turmoil could lead to a lack of oil supplies down the line, if companies failed to make sufficient investments.

“We must put our money where our mouth is, by making prudent and timely investments; balancing long-term objectives and short-term interests; and meeting the energy needs of the future, while providing attractive investment options and delivering value to shareholders,” he maintained.

Al-Falih pointed out that soaring project costs and cost overruns throughout the industry were “dragging many projects”. At Saudi Aramco, he disclosed, project costs had roughly doubled over the last decade, despite the company deploying cutting-edge technologies and applying robust project management systems to mitigate cost escalation.

“These project challenges are driven in part by shortages and bottlenecks in our supply chain, including drilling contractors, shipyards, EPC firms, and materials and equipment suppliers,
which have led to growing quality, schedule and cost pressures,” he affirmed.

Al-Falih said that, of course, larger investments and a shrinking number of easier and cheaper fields meant more expensive production and so industry profitability was plateauing after a banner decade.

“As a result, investor expectations go unfulfilled and amid this squeeze between higher costs and shareholder demands, we are seeing project cancellations and a general capital curtailment,” he observed.

Al-Falih said the petroleum industry was also experiencing critical manpower shortages.

“We are experiencing critical manpower shortages in the industry, including the services sector, as a generation of older veterans retires; enrollment in earth-science programmes continues to stagnate; and our industry competes for talent with other sectors.

“Finding and attracting competent engineers, rig personnel and geoscientists to run ever more complex and expensive operations has become an acute challenge,” he professed.

Clouding the outlook

Al-Falih also contended that global economic weakness was hindering short-term growth in oil demand, while “turmoil in oil producing regions such as Africa, the Middle East and the former Soviet Union is further clouding the outlook.”

In addition, the industry continued to grapple with environmental concerns, highlighting climate change as the main priority.

However, the Saudi Aramco chief said that it was not all gloomy and dark - there were some silver linings in the industry too.

Global primary energy demand, he said, was expected to rise by more than a third from the current level over the next 20 years.

“At the same time, we can take comfort that alternative energy sources — despite facing multiple obstacles — are beginning to grow their contributions, although slowly and starting from a small base.”

But Al-Falih stressed that the oil sector would have to work hard to provide around 40m b/d of new capacity over that period, in order to offset the decline in output from mature fields.

“To put that figure into perspective, that is equivalent to approximately 30 Norways or 15 times America’s current unconventional oil production.”

Al-Falih said that while there were plentiful resources in place, oil prices would need to be attractive for oil companies to proceed with the development of complex and expensive projects, both in conventional and unconventional plays. Looking at the future, he said that each company, naturally, would choose its own course, given its unique capabilities and objectives.

Companies which had the strength, resilience and vision to deal with uncertainty and volatility, and which were both innovative and adaptable to changing conditions, would be the ones to turn significant challenges into promising opportunities — and thus to thrive and prosper.

“Given the nature of our industry’s challenges and knowing that the achievement of our targets would stretch even the best organizations, I must stress that collaboration within the industry — and indeed with other industries where appropriate — is essential,” he said.

At Saudi Aramco, said Al-Falih, the company had realized the major shifts in its landscape and had undertaken a transformative and comprehensive change process that leveraged innovation and technology, talent, agility and resilience and its business investments and portfolio expansion, in addition to strengthening the firm’s proactive role in the broader development of the Kingdom.

“We are convinced that innovation and cutting edge technology are the key strategic enablers of our current success and future competitiveness, which is why we are tripling our research and development (R&D) manpower and increasing our R&D funding five-fold.”

Al-Falih continued that Aramco’s research agenda was targeting a leadership position in about a dozen technology domains. They included multiple technologies that would help it achieve the company’s goal of increasing its oil recovery to 70 per cent and allow it to add more than a 100bn b of oil resources to its already large portfolio.

“In addition, we are targeting major advancements in drilling, which constitutes 60 per cent of our upstream budget and is vital to realizing our significant unconventional gas potential,” he stated.

Al-Falih concluded his address by saying that in recognizing the abundance of oil resources and the immense opportunities Saudi Aramco had, “I remain confident that our best days are yet to come.

“So rather than storm clouds, I look forward to even brighter days ahead, confident that the kind of technological know-how and innovative capability represented in this conference will play an important role in achieving those better days,” he said.
Venezuela celebrates 100 years of oil activity

The 41-metre deep well, Zumaque 1, began production on July 31, 1914, in the small municipality of Mene Grande. It was the beginning of Venezuela’s journey to becoming one of the world’s most important oil-exporting countries. Back then, people were still using gold coins and riding mules, plows were pulled by oxen and fishing was done with nets. Based on material from Venezuela’s national oil company, Petróleos de Venezuela, SA (PDVSA), the OPEC Bulletin’s Maureen MacNeill reports on this oil centenary.

With the drilling of the first oil well using a wooden derrick of the Anglo-Dutch Caribbean Petroleum Company on the lovely east coast of Lake Maracaibo 100 years ago, a groundbreaking change came to Venezuela. Nothing would be the same again.

“All eyes were on the Cerro La Estrella (the point where the well was drilled),” wrote Manuel Péres Gil, a historian and chronicler of the Zulia region — located in the most north-western part of the country — and President of the Chroniclers Association of Zulia. “The men showed their best skills to the ‘musiúes’ (foreigners, in French messieurs) so that they could be hired.”
It was the “beginnings of the history of Venezuelan oil,” according to Dr Álvaro Silva Calderón, who was OPEC’s Secretary General from July 2002 until December 2003. The story was destined to be a difficult and turbulent one.

Even before this time, in 1829, military and political leader Simón Bolívar enacted a legislation in the shape of a decree reserving the property of “mines of any kind” to the Republic, thus replacing the Crown of Spain with independence. This principal has been the cornerstone of state ownership of hydrocarbons and the concept of sovereignty over natural resources, according to PDVSA historical documents.

The discovery of ‘mene’

Zumaque 1 is the most important well in Venezuela, stated Eglys Dorante, chronicler of the municipality of Valmore Rodríguez, “because it is the cradle of Venezuelan oil production.

“It’s very representative of not only the oil idiosyncrasy, but of all the peoples of the Eastern Coast; oil has been the source of wealth. It has produced in the country economic, cultural and political changes and substantial earnings.”

Oil trade was initiated in the municipality of Rafael María Baralt; Zumaque 1 in Mene Grande is part of the municipality.

“That area is still full of oil and we call it ‘mene’ (outcroppings or natural springs of oil), where oil flows daily along the downtown of Mene Grande, a unique phenomenon in the world. Fires often occur when the summer is hot on Cerro La Estrella,” wrote Gil, who claims the well is still producing 20 barrels of oil per day. Originally the ‘mene’ was used for waterproofing canoes, lighting torches, improvising animal traps and processing drugs, among other things.

One hundred years ago the ‘mene’ was quite liquid during the heat of the day, hardening in the cool evenings. “The animals which were grazing or passing by … got stuck,” he wrote. The discovery of oil and promise of work attracted migratory labourers from many regions of the country, including Trujillo, Lara, Falcón and Nueva Esparta. The men faced terrible conditions: they had only food and shelter in a shack. Diseases were rife, such as malaria, and it was hot, humid and snake infested, stated Álvaro José Cardozo, a retired PDVSA employee whose father was a worker in the early production of Zumaque 1.

“There was no security in the work, no gloves and no helmets,” his father told him. “When the well began producing my dad was given three pairs of pants, two shirts and a pair of shoes,” states Cardozo.

“The Americans (who also came to Venezuela...
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for oil), who lived separately and in well-fenced houses, were the ones who ruled. There was little contact with them and the relationship was not good,” claimed 73-year-old Gilberto Villalobos, who has lived his whole life on the shores of Maracaibo Lake in San Timoteo.

Workers were driven by the poor conditions to strike in 1925, demanding increases in salaries, along with proper housing, medical care, medicine and drinking water. They had to endure the English, Dutch and Americans exploiting the country’s riches and living a high life. Salaries increased to 5–7 bolívares a day and starting in 1926 workers had homes in the fields of the lower part of Cerro La Estrella. There was still a strong separation between these workers and the foreigners who lived in luxury at the top of Cerro Siberia and in La Estrella field.

When workers demanded better conditions a second time in 1936, three workers and two young people at the assembly were brutally murdered by a drunken army commander. Their requests were not filled. Another big oil strike took place in the 1950s.

“Afterwards they received schools for their children, houses, commissary, medical care, vacations, utilities, medicines, hospitalization,” stated Cardozo.

The Orinoco Belt — the largest deposit of extra-heavy crude in the world — was discovered in 1936. The Ministry of Mines and Hydrocarbons came into existence from the year 1950, 36 years after the start of oil production; since 1943 fiscal revenues were always a minimum of 50 per cent. From the beginning of its oil industry, Venezuela was a presence to be reckoned with. In fact, the country was the largest oil exporter in the world from 1928 to 1970, according to PDVSA.

Chávez drives change

Although Venezuela nationalized its oil industry and created PDVSA in 1975, it was a carbon copy of the previous model, according to historical documents, thus each foreign licensee became a subsidiary. The same practices, values, trade agreements and technological dependence of the past remained. This led to frustration and open confrontation with opposition strikes in 2001 and a coup d’etat in 2002, all of which saw production fall from 2.9m b/d to 35,000 b/d by the end of the year. By 2003 the country’s oil production recovered, reaching 3.0m b/d.

President Hugo Chávez (who ruled from February 2, 1999, until his death on March 5, 2013) was the real drive behind change, said Villalobos. “Who put things in their place and gave us courage was Chávez.” He said:
“Study hard because our oil industry needs new generations and so today we have his legacy.”

Indeed, during his rule, he did much to wipe out illiteracy, with UNESCO declaring Venezuela “illiteracy-free territory” in 2005 after nearly 1.5m countrymen received access to basic education. Chávez invested large amounts of the oil income into bettering the condition of Venezuelans generally, earning the undying respect of his fellow countrymen.

Former worker in the sector, Miguel Angel Bastidas, states, “President Chávez came and transformed the oil industry for the good of all Venezuelans. We should care for what he left us ...”

Speaking in early August, Minister of Popular Power for Oil and Mining and President of PDVSA, Rafael Ramírez, who is now the Minister of Popular Power for Foreign Relations, said: “A hundred years after the beginning of oil production in the country, we can talk of full oil sovereignty, a national, popular and revolutionary policy.”

Marking centennial celebrations of Zumaque 1 in Mene Grande, he continued, “... here in Zulia State, the Venezuelan working class was born, giving rise to the first political organizations in the country and the development of progressive thinking, in light of the awareness of this new reality.”

**Sovereign oil industry**

Ramírez also strongly praised Chávez during his speech, putting words to Chávez’s ‘courageous action’: “Undoubtedly ... today we can say with clarity that we have the full and sovereign management of our oil industry, thanks to the clarity, courage and determination of the Commander President Hugo Chávez.”

When Chávez took over the presidency in 1999 he turned Venezuelan oil policy around 180 degrees, directing it towards the recovery of sovereignty over oil, the reversal of the privatization process that affected PDVSA and the defense of OPEC and fair prices for oil, according to PDVSA documents. The same year, Venezuelans approved the Constitution of the Bolivarian Republic of Venezuela, under which mining and hydrocarbon deposits were declared public property, meaning the state owns the oil industry and all shares of PDVSA.

Since that time, PDVSA has been successfully moving from one strength to the next, opening offices in Cuba, China, Uruguay and Bolivia, regaining control of oil fields, starting drilling in the Orinoco Oil Belt, and signing international cooperation agreements. *Petroleum Intelligence Weekly* ranked PDVSA as fourth among the world’s largest companies in the oil business in 2010 and the country was recognized as having the world’s biggest oil reserves in the same year, certified by OPEC.

Venezuela has always had a very close connection to OPEC. Ramírez stated at the ceremony, “The creation of the Organization of the Petroleum Exporting Countries (OPEC) is probably one of the most important achievements ... So, finally, we arrive at the nationalization of the oil industry.”

Ramírez added: “One hundred years into our commercial production of oil, however, we still have much work, many challenges, many problems, but also many future prospects. Our historic aim is Venezuela as a country power, Venezuela as an energy power ...”

“Today I want to speak on behalf of hundreds of thousands of oil workers who made possible, over the years, the development of the country’s most important industry,” said Ramírez. “I want to speak also on behalf of over 100,000 new PDVSA workers, who work every day selflessly for the strengthening of our country.”

Celebration at Zumaque 1, which began production in 1914.
Join the OPEC Bulletin’s Scott Laury as he takes you on a sneak preview tour of this spectacular new centre, created to support Saudi Arabia’s strategy of promoting social and intellectual progress, while developing cultural creativity.
The King Abdulaziz Centre for World Culture is scheduled to open in 2016 in Saudi Arabia’s Eastern Province city of Dhahran.

The multi-purpose facility will house a four-gallery museum with permanent and visiting exhibitions, a world-class library and archive, a theatre, a Lifelong Learning Centre, a multimedia theatre and a children’s museum. There are also plans to host a series of youth enrichment and innovation programmes, and live events, in addition to offering multimedia venues, cafes and a gift shop.

The Centre was named after King Abdulaziz ibn Abdulrahman Al-Saud in honour of his many contributions to the development of the Kingdom and its people.

Some of the thematic elements to be presented by the Centre will include Saudi Arabia’s natural and social history, Islamic civilization and culture, and contemporary art from leading national and regional artists. Visitors to the exhibits can expect a high-tech, interactive experience aimed at bringing art, culture and education alive.

Saudi Aramco supported initiative

This initiative is spearheaded by Saudi Aramco, the national oil and gas company of Saudi Arabia, as the flagship of its corporate citizenship programme.

The facility’s location in Dhahran was chosen not only due to its proximity to the company’s World Headquarters, but also because of its location next to the historically significant Prosperity Well, a national landmark commemorating the spot where oil was first discovered in Saudi Arabia.

While acknowledging this original source of the Kingdom’s prosperity, the Centre seeks to promote and develop a new source of wealth in terms of a skilled and creative community for future generations.

The Centre is part of an even larger master plan that comprises a 220,000 square metre complex called the Knowledge Park, which will also include the Saudi Aramco Exhibit, the main oil museum in the Eastern Province, as well as a newly constructed mosque.

A cornerstone for future generations

On May 20, 2008, King Abdullah ibn Abdulaziz Al-Saud, the Custodian of the Two Holy Mosques, laid the cornerstone for the project on the occasion of Saudi Aramco’s 75th Anniversary celebration in Dhahran.

After construction began, the Centre’s Director, Fuad F Al-Therman, commented in an article posted on arabnews.com: “This stage of construction marks a key milestone in the progress of this extraordinary project, which we hope will be one of the world’s wonders.”

Architectural mix of innovation and functionality

The Norwegian architectural firm, Snøhetta, was selected to design the multi-purpose facility. The firm previously won the Aga Khan Architecture Award for its design of the Bibliotheca Alexandrina, a major library and cultural centre situated on the shore of the Mediterranean Sea in the Egyptian city of Alexandria.

Snøhetta’s design seeks to provide functionality in an innovative and creative environment. Inspiration for the design was drawn from Saudi Arabia’s unique geology and rock formations, which are instrumental in preserving its petroleum resources.

The Centre’s website explains this symbolic link between geology and human creativity in the context of how it will benefit Saudi Arabia’s future generations: “Like these physical rocks, the Cultural Centre will not only preserve, but generate promising human creativity...”
that will become the Kingdom’s sustainable energy of the future."

A chronological element was also integrated into the design. Below-ground structures focus on the past, including the archives and the museum. The ground level is related to the present day and includes performing arts spaces.

The modernistic tower jutting upwards from the structure is called the Knowledge Tower and includes the Lifelong Learning Programme, which is designed to represent a path to continuous learning for future generations. Mountain-like structures flank the sides of the Knowledge Tower, giving it a geographically unique design.

The ultra-modern exterior facade consists of stainless steel tubes that are individually formed and bent to wrap around the building, creating a sleek industrial look. In contrast, the facility’s interior has a warmer, more earthy feel through the use of traditional building techniques, such as the rammed earth method, which incorporates sand, gravel and clay to erect walls.

The Great Hall is the building’s architectural centrepiece, displaying the best of world cultures through exhibits, events and community forums.

The Centre has gone to great lengths to ensure its construction efforts are environmentally friendly and in accordance with Leadership in Energy and Environmental Design (LEED) standards, ensuring its sustainability for years to come.

The exterior grounds will be landscaped with trees and gardens, as well as walking paths.

A multidimensional approach

The Centre’s building is custom designed to accommodate a wide variety of venues and programmatic elements, some of which are outlined below:

— The Archive will store rare cultural and historical documents, films and books, including a complete collection covering the entire history of Saudi Aramco. Documents and artifacts will be preserved, and some content will be available digitally for easy access. Special provisions may be made for academics or researchers who may request access to the facility for their research projects.
The museum will feature four galleries presenting national and international exhibitions on contemporary visual and multimedia art, as well as on Saudi Arabia’s natural and social history. The rich heritage of the Arabian Peninsula and its ancient civilization will also be explored through the museum’s exhibits. Gallery 1, with the title ‘Funoon’ (expressions), presents modern and contemporary art from the Middle East, with a special focus on up-and-coming figures in the Saudi art world. Gallery 2, termed ‘Alyaal’ (generations), contains temporary exhibitions on the Kingdom’s culture and traditions, both ancient and contemporary, helping to bridge the gap between tradition and modernity. Gallery 3, ‘Knooz’ (treasures), presents exhibitions on Islamic civilization through the display of art and objects, with continuity and diversity being the common themes. Finally, Gallery 4, themed ‘Rihlaat’ (journeys), will use innovative audiovisual techniques to look at the relationship between people and the environment through the years, from ancient times to today’s globally interlinked world.

Spread over four floors, the library contains hundreds of thousands of books, special collections, periodicals and electronic resources in English and Arabic. Designed to be a social space, the library will host lectures, discussion groups and book clubs. Multimedia screening rooms and a children’s book section are also offered.

Geared towards younger people aged 2–12, the Children’s Discovery Zone (CDZ) offers discovery labs, outdoor activities and interactive exhibits designed to pique the curiosity and engage the intellect of children. Some themes include art, sound, drama, technology, environment, innovation, culture and citizenship.

The Theatre contains an auditorium seating 900 people and a state-of-the-art stage that plays host to national and international performance artists.

The more intimate Multimedia Theatre with a 300-seat auditorium is a venue in which the emerging talent of Saudi Arabia’s creative digital media sector can present their work. The Multimedia Lab will provide the Kingdom’s aspiring multimedia professionals with training using the latest, cutting-edge technologies and techniques through lectures, workshops and conferences on areas such as film, design and animation.

The Great Hall will present large-scale travelling exhibitions, in addition to being the venue for social events, banquets and conferences.
Programmes to educate and engage

An ambitious series of programmes is planned for the Centre, some of which are already operational. Last year, during its pre-opening phase, a number of new initiatives were already carried out.

“The Centre will offer an array of exhibits, events and learning tools that engage and educate students, adults and scholars,” the Centre’s Director, Al-Therman, said.

“Individually, these experiences will enable visitors to develop their potential as human beings; collectively, they will help Saudi society to succeed in an increasingly globalized world. By educating visitors about yesterday’s challenges and achievements and exciting them about tomorrow’s possibilities, the Centre will enrich lives and accelerate future accomplishments.”

Knowledge, creativity and innovation are themes found throughout the diverse array of programmes, which are already making their mark during the pre-opening phase.

The Ithra Knowledge Programme is a travelling exhibit that was created to support the Kingdom-wide strategy of transforming Saudi Arabia into a knowledge society. It toured the Kingdom the last two years, welcoming two million visitors in 2012. The Programme has featured an exhibition entitled ‘101 inventions that changed the world’, original performances from local and international artists, and a special exhibit of art masterpieces, which showcased a famous Picasso painting on loan from the Centre Pompidou in France.

The Keystone Programme is geared towards young innovators and entrepreneurs interested in transforming their ideas into reality. Created as a pilot programme in 2011, the Centre cooperates with ArtScience Labs and the Lab at Harvard University to offer a wide range of programmes with a new theme each year. In 2013, 36 young Saudi professionals from varied scientific backgrounds...
tackled the theme of synthetic biology through an eight-week training course led by national and international experts. The Programme concludes with participants presenting their innovations to a panel of business men and women.

The Creativity Forum was birthed out of the Keystone Programme to bring together leading creative minds from across Saudi Arabia and internationally for lectures and activities related to creativity in science, technology, artistic design and architecture. The debut event in 2013 featured presenters from the United States, the Netherlands, Germany, Sweden and the United Kingdom. Forum participants spent two days exploring creativity from different angles and studying the architectural design of the Centre’s facility by the Snøhetta Company as a model of creative expression and innovative engineering.

Promoted as “an invitation to read,” the Centre’s World Book Day Symposium was created to introduce books and encourage reading and content development across the Arabian Peninsula. The programme is also spearheading a research project on reading trends in Saudi Arabia.

As part of the Kingdom’s inaugural celebration of World Heritage Day, the Centre provided a presentation on the numerous possibilities that can be achieved through cross-cultural exchanges with a special focus on how future generations will benefit from these endeavours.

The iThra Youth initiative provides hands-on learning experiences for Saudi students and their teachers in the fields of science, technology, engineering, math and the arts. In support of the Kingdom’s transition towards a knowledge-based society, the initiative has set an ambitious goal of reaching two million Saudi youth by 2020.

Thousands have already taken part in the programme, which is based on arts-science training modules designed in collaboration with the University of California at Berkeley’s Lawrence Hall of Science, the University of Southern California, the Art Centre College of Design and MathZoom, with co-sponsorship by Tatweer and the Ministry of Education.

This programme was one of six internationally to win the 2013 World Innovation Summit for Education Award, which acknowledges unique initiatives that address educational challenges.

The iThra Performing Arts Programme debuted in 2012 to provide Saudis aged 16 to 28 with valuable learning opportunities in the performing arts and the technical aspects of theatre. To date, 480 people have participated, receiving 130 hours of training. The programme is produced through a partnership between the National Youth Theatre, an internationally renowned youth arts organization in Great Britain, and the Al-Hasa and Dammam arts and culture societies.

The Fabrication Laboratory (FABLAB) Dhahran, the Centre’s joint effort with the King Fahd University for Petroleum and Minerals, is a digital laboratory in which business people and students are able to design and produce a variety of products, including cell phone cases, electrical components, furniture, t-shirts and robots. The first FABLAB was pioneered by the Massachusetts Institute of Technology, and today there is a global network of 200 such labs. The Dhahran lab began operating in January 2014 and seeks to inspire a new generation of entrepreneurs, innovators and engineers.

The Lifelong Learning Programme will honour the legacy of continued learning in the Arab and Muslim worlds and in Saudi Arabia by providing a wide array of Arabic and English language educational resources for visitors of all ages and backgrounds. Programmatic elements include interactive school visits, special lectures, workshops and e-learning modules.

A world wonder

The Centre’s innovative architecture and design matched with its noble mission of promoting knowledge, culture and creativity will make it a treasure for future generations of Saudi Arabians.

Director, Al-Therman, put it best when he said: “We envision the Centre as a world wonder not only because of its exceptional architecture and engineering, but also because of the way it connects with society to advance knowledge, creativity, and cross-cultural engagement.”

All images courtesy of Snøhetta.

The modernistic tower jutting upwards from the structure is called the Knowledge Tower, which is flanked by several rock-like structures. This design is inspired by Saudi Arabia’s unique geology and rock formations, which are the source of the country’s petroleum.
On May 20, 2008, government officials, company executives, employees and special guests gathered in Dhahran to celebrate the 75th anniversary of Saudi Aramco. The event was held near the Saudi Aramco Exhibit in huge, elaborate tent structures built especially for the occasion. Honoured guests included King Abdullah ibn Abdulaziz Al Saud, the Custodian of the Two Holy Mosques, and leaders of the Gulf Cooperation Council countries.

In an article by Saudi Aramco News entitled ‘King helps celebrate 75th,’ the festivities were outlined in detail.

The event began with a tour of an exhibit highlighting Saudi Aramco's history and operations. The centrepiece of the exhibit was the original signed concession agreement between Saudi Arabia and the Standard Oil Company of California, which was prominently displayed in a glass case.

King Abdullah honours Aramco

Guests were then ushered into the main tent for the evening’s festivities. King Abdullah set the tone for the historic event with his opening remarks in which he lauded Saudi Aramco for its success over the previous 75 years in fostering development within the Kingdom and for its important role in providing energy to the world.

“On this occasion, we celebrate the passing of 75 years of national growth, so thank you very much to the men and women of Saudi Aramco,” he proclaimed. “The country has given Saudi Aramco what it needs to become successful and exceptional. It gave the company flexibility with which it nationalized technologies and gained from international experience in the necessary fields and industries.”

Ali I Al-Naimi, Minister of Petroleum and Mineral Resources, also gave remarks underlining the influential role the company and its employees had played in advancing the Kingdom towards progress.

“Today, our employees, both Saudi and expat, recall 75 years of dedication and hard work to build and develop Saudi Arabia’s oil industry, an industry that has spread its wealth and prosperity throughout the Kingdom, from north to south and east to west,” he said.

“While I realize there are no words to convey how much this event means to the Kingdom and to Saudi Aramco,” he continued, “I want to, through this speech, highlight the sense of appreciation and pride for all who have left their mark throughout our history of oil production. This industry will continue to bring progress and advancements in the future, thanks in no small part to the support of our country’s leadership, as well as to the dedication, hard work and innovation of this company’s valued employees.”

A successful past, a bright future

The President and Chief Executive Officer of Saudi Aramco at that time, Abdallah S Jum’ah, spoke next, expressing his optimism for the company’s future.

“As proud as we are of our past and present, we see an even brighter future ahead of us,” he said. “The work and projects we have now will make us better prepared for the next 75 years; they cement Saudi Aramco’s status as a fully integrated company, one of a kind in terms of its expertise, its size and its fundamental role nationally and globally.”

He then proceeded to unveil the plans for the King Abdulaziz Centre for World Culture, which was to be erected at that very location seven years later. A film was screened presenting the Centre’s purpose and what it would offer the Kingdom and its people.

The evening’s festivities culminated with a programme of entertainment and gifts bestowed on King Abdullah and the GCC leaders.

Commemorating the 1947 visit

The event also commemorated the historic visit of King Abdulaziz to the company in 1947 with attendees and
Dhahran, located in Saudi Arabia’s Eastern Province, is a key city in the Kingdom’s oil and gas history.

In 1933, an oil concession agreement was signed between Saudi Arabia and Standard Oil Company of California.

In 1935, the first test well was drilled at Dhahran, and after several years of fruitless exploration, the tides changed drastically.

On March 4, 1938, Well Number 7 started producing 1,585 barrels/day at a depth of nearly one and a half kilometres, making this the first commercially viable oil well in the Kingdom. This well is referred to interchangeably as the Prosperity Well or the Discovery Well and has since become a famous national landmark visited by Saudis and tourists from around the world.

Standard Oil later formed a subsidiary called the Arabian American Oil Company (Aramco), which eventually was acquired in full by the Saudi Arabian government, taking on the new name Saudi Aramco. The company has been headquartered in Dhahran for nearly 60 years. Since its inception, it has grown and diversified exponentially from that fateful day in 1938 when Well Number 7 was tapped. Today, it is a fully integrated global petroleum and chemical enterprise that manages conventional crude oil and condensate reserves totalling 260.2 billion barrels and gas reserves of 284.8 trillion standard cubic feet. With 57,000 employees from 77 countries, the company is a world leader in hydrocarbons exploration, production, refining, distribution, shipping and marketing.

performers dressing in period costumes to mark that special occasion.

Miles Snyder, from the United States, was one of the few in attendance to have been present at both occasions with 61 years in between. He described his feelings of awe and elation at being able to meet King Abdulaziz on that momentous occasion.

“It was wonderful,” said Snyder. “We American kids were able to shake the hand of a real king! We all remember the event well. We remember the sight of the King, seated in a large easy chair atop a colorful carpet, with a little table with cookies on it beside him. He was surrounded by his colourful retinue, including many of his sons.”

He continued by sharing a few words about the fond memories he had of his experiences growing up in the Kingdom.

“Today, we join not as children but as adults; many of us are grandparents,” he said. “When we were young, that sense of magic was everywhere, living as we did in the Kingdom of Saudi Arabia. Each of us regards ourselves richer, wiser, more tolerant and understanding because of this great adventure.”
OPEC hosts first modelling applications workshop

Effective modelling tools vital for Secretariat’s work
OPEC hosted its first Workshop on Road Transportation Modelling and other Modelling Applications in September, at which it was stressed that the Organization’s modelling tools and capabilities are key to ensuring that research carried out at the OPEC Secretariat in Vienna is both accurate and up-to-date.

“Indeed, they (the models) are a priority area and regarded by the OPEC Board of Governors as critical,” Dr Omar S Abdul-Hamid, Director of OPEC’s Research Division, said in closing remarks to the one-day meeting, which he described as being “very fruitful”.

OPEC’s reputation

Abdul-Hamid, who earlier made the workshop’s welcoming address, stressed to assembled delegates from Member Countries, that so much importance is placed on this area of work because the Secretariat’s modelling efforts affect not only research quality but, in the larger context, OPEC’s reputation on the international scene.

“I cannot emphasize strongly enough just how important the various models used in the Research Division are to the overall work of the Secretariat, our lasting ties with Member Countries and the benefit of the Organization as a whole,” he affirmed.

“And they will become increasingly important in the years ahead as OPEC and the global energy sector in general has to address new innovations in overcoming the inevitable challenges that characterize the intricate and often volatile business we are in,” he told the workshop.

Some 24 experts from OPEC Member Countries, including OPEC National Representatives, attended the gathering, which featured in-depth presentations offering
a comprehensive overview of the Research Division’s five modelling applications.

Delegates also heard a report on the global transportation outlook to 2040, delivered by a thermodynamics expert from a German automotive consultancy firm.

The workshop was specifically held to inform Member Countries of the utilization and aims of the Secretariat’s models and to gain their views and suggestions on how best to maintain their optimum performance going forward.

As the Research Division Director said in his opening remarks, the Secretariat considers the input of Member Countries as being invaluable for giving a broader, concerted view as the Organization takes steps to fine-tune the models currently in use within the Research Division.

**Five models in use**

The applications comprise the OPEC Road Transport Model (ORTM), which encompasses many features to simulate future technology scenarios for the road sector; the OPEC World Energy Model (OWEM), which dates back to 1984; the World Oil Refining Logistics Demand (WORLD) model, the Oxford Global Economic Model (OGEM), with its integrated GDP forecast model, and the E3 Models in Environmental Studies, very much still a work in progress.

“All these models are essential for the efficient functioning of the Organization, particularly in support of the Conference’s decision-making process, where they provide detailed forecasting and analysis of the international oil market, the global economic situation and related issues,” said Abdul-Hamid.

He stressed that the modelling tools represent the foundations of the Research Division’s day-to-day activities with regard to providing up-to-date and accurate information, statistics and data flow that are vital for the smooth-running of the different departments within the Secretariat.

Abdul-Hamid explained that the background to the workshop’s examination of the models arose from a report prepared by the Research Division’s Modelling Assessment Task Force (MATF), which was presented to the 13th Special Economic Commission Board meeting in September last year, together with the agreed follow-up.

“The Board regards the close assessment and monitoring of the Secretariat’s modelling tools as a critical issue for enhancing both the Organization’s research activities and its international standing going forward,” he affirmed.

The MATF report, he outlined, assessed in detail the current performance of the respective models, indicating their strengths and areas for improvement.

“Importantly, it highlights that in today’s ever-changing world, energy markets, the players and the dynamics, together with estimation and forecasting techniques are constantly evolving.

“In recent years, better and more efficient software, qualified data and modelling practices have improved the performance of such models and reduced the uncertainties regarding future trends.

“Hence, the need for the OPEC Secretariat to keep abreast of all the latest developments, in order to continue delivering high-quality analysis and fulfilling the requirements of the Conference and Member Countries,” he stated.

Abdul-Hamid noted that the report provided a list of recommendations for the further improvement and enhancement of the models in existence, which the Secretariat had already started to implement.

The Board felt it pertinent to tap the expertise of Member Countries, “to gain your views on the Secretariat’s modelling capabilities and to ensure their continued best practice. I am sure your involvement in this venture will greatly assist us in solidifying our plans and boosting this vitally important area of the Secretariat’s work,” he told delegates.

Turning to the workshop’s agenda, proceedings began with a presentation on the global road transportation outlook by 2040 by Dr Philipp Adomeit of FEV GmbH of Germany.

This provided participants with a detailed overview and outlook into different technologies and fuels to be implemented by the automotive industry in the coming years. The impact on future demand for gasoline and diesel was analyzed, alongside the share of alternative fuels, such as natural gas.

Adomeit maintained that transport fuels for passenger cars will be gasoline dominated and — according to FEV analysis — reaching a demand plateau by 2030–35. Diesel and compressed natural gas (CNG) will play a more important role for cars beyond 2035.
Generally, he said, the share of diesel as a road transport fuel will increase and exhibit the strongest growth potential in absolute numbers among all road transport fuels. Adomeit’s comments were followed by presentations on the five models currently in use.

**Indepth presentations**

Secretariat Energy Models Analyst, Mehrzad Zamani, gave detailed information on the ORTM, the objective of which is to provide a granular analysis of the road transport sector.

It projects oil consumption, sales and stocks by vehicle type, fuel economy, and vehicle miles travelled for passenger cars and commercial vehicles.

This was followed by a presentation by Senior Research Analyst, Garry Brennand, on the longstanding OPEC World Energy Model (OWEM).

OWEM is a large-scale and wide-ranging econometric model, maintained and developed in-house, with almost 600 equations and identities. Its key modules focus on oil demand by sector and oil supply, and cover 11 regions.

The afternoon session began with a presentation on the WORLD model, made by Senior Research Analyst, Dr Jan Ban.

WORLD, an optimization model based on linear programming techniques, is used by the Secretariat for projections and simulations of downstream oil operations.

Modelling and Forecasting Analyst, Afshin Javan, then took the workshop through the OGEM, explaining, among other things, the advantages and disadvantages of Vector Auto Regressions (VAR) in comparison with the Computable General Equilibrium Model.

In the final presentation, the Secretariat’s E3 Models in Environmental Studies was outlined by Research Analyst, Dr Eleni Kaditi.

This application has become increasingly important in quantitatively assessing the impacts of diverse policy strategies on future economic development, climate change and energy demand.

There was lively debate between each presentation as delegates asked pertinent questions and made valid observations and suggestions on the future workings of the respective models.

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Workshop delegates take time out for a group photograph.
Boundary Dam has the world’s first post-combustion coal-fired carbon capture and storage (CCS) facility. When it starts operations in the coming weeks, the pre-sold liquefied carbon dioxide (CO2) produced there will be sent to nearby oil fields via pipeline for use in enhanced oil recovery (EOR), helping recoup some of the electricity producer’s costs. The technology could potentially be used to reduce CO2 emissions from any fossil fuel-fired plant and the EOR potential is staggering.

The OPEC Bulletin’s Maureen MacNeill recently visited the plant.

Boundary Dam is not the biggest power plant on the international scale at 900 megawatts (MW) when compared to humongous coal-fired power plants like Taichung in Taiwan, which has a capacity of 7,425 MW, but in terms of what it has accomplished regarding carbon capture and storage (CCS), it is indeed a giant in the world.

With six coal-fired units built between 1959 and 1973, Boundary Dam — part of Canadian province Saskatchewan’s SaskPower — was being faced with some hard decisions a few years ago. The Canadian federal government decided to pass regulations in 2011 — to come into force in 2015 — creating strict CO2 emissions laws which many of its older units would quickly no longer meet.

The Boundary Dam plant emits 1,100 tonnes of CO2 per gigawatt hour (GWh), explains Michael Monea, President of SaskPower’s CCS Initiatives. Natural gas emits half that at about 500–550 tonnes per GWh. The new Canadian regulation will allow only 420 tonnes of CO2 per GWh, he continues.

“Our plant will release 120 tonnes of CO2 per GWh (from Boundary Dam Unit 3), capturing 90 per cent of the CO2 plus 100 per cent of the sulphur dioxide (SO2),” says Monea. “Environmental groups do not want to see coal burned, but the argument is unrealistic … this is cleaner than natural gas.”

Mike Zeleny, SaskPower’s Project Manager of Clean Coal Transition to Operations, says: “It is a win–win situation for us and (oil company) Cenovus, which is purchasing the CO2. Also, for the government, it will receive more royalties from oil production and eliminate one million tonnes a year of CO2 from the one unit.” He adds that this is equivalent to taking a quarter million mid-sized cars off the road.

The company decided to first try CCS technology with Boundary Dam Unit 3 (BD3), which was most urgently in need of upgrading.

Most important to the project reaching completion has been supportive shareholders, says Zeleny. “In 2011, many were talking about doing the same thing, but they all dropped off. So, Boundary Dam will be the first to start up and will set the first real watermark on cost. We are excited and think it will be very effective.”

The plant — the most important facility for SaskPower and large in terms of the population base it serves, providing about one-third of the power for Saskatchewan’s 1.1 million people — entered into some serious discussions about a CCS addition even before 2000, when Canadian Clean Power Coalition Studies were taking place.
The tipping point for Boundary Dam — the point at which the CCS concept could be propelled into reality — came in 2008, when SaskPower was given CDN $240m for clean energy from the Canadian government. This was used to undertake essential studies, and construction of the CO₂ facility started in May of 2011.

“We could not have done it without the federal government,” says Zeleny, adding that the provincial government targeted BD3 for the CO₂ upgrade. “Good stars lined up and the provincial government worked hand-in-hand with a Crown corporation and politicians.

“They are one of the first groups in the world to recognize the potential of CCS. I think that once we are running, we will have a lot of fans who once questioned what we are doing.”

Start-up
Walking through the newly built CCS part of the plant, workers are bustling around doing last-minute touch-ups for the big launch, expected to take place this autumn. Zeleny says tests have been ongoing for a month. In total, the CCS project cost $1.3 billion; $450m was spent on upgrading Unit 3 and the rest is associated with the capture facility.

“It took half the manpower hours that went into building the CN tower (in Toronto) to build the CCS facility,” says SaskPower Strategic Communications Consultant, Jonathan Tremblay.

Unit 3 was chosen for the CCS project because it is turning 50 in 2015, he adds. “So we had enough time to retrofit it. Units 4 and 5 will face the same problem by the end of the decade.” In fact, without CCS the power provider would have to shut units 3, 4 and 5 down by 2019, states Zeleny.

Saskatchewan is heavily impacted by the federal government’s emissions decision as 50 per cent of its power comes from coal, he notes, while the rest of the country’s overall power supply is only 20 per cent coal-fed.

“Saskatchewan’s case is similar to that of the United States, where 42 per cent of power is supplied by coal,” he observes. The Americans are closely watching Boundary Dam’s progress, as is the rest of the world.

“There is so much global interest in this project,” maintains Zeleny. “A lot of US plants are in the same position. Saskatchewan is under the gun, it is a big deal.”

Zeleny looks at it from the point of view of a public service provider. Other commodities are not reasonable for the province; a large nuclear facility would not be practical, the province has some hydro and wind.
“Without coal we would be forced to go to gas and the gas price could shoot up.”

Coal is the cheapest source of energy and stable as a feedstock, while gas prices are more volatile, states Tremblay. Furthermore, Saskatchewan has about a 200–300 year supply of coal, though the amount burned daily is equal in weight to the Eiffel Tower. Most of the coal in the province comes from the northern tip of the Bakkan formation, famous for the oil boom it has led in the US.

Boundary Dam’s location in southern Saskatchewan was initially chosen because it lies in the middle of the province’s coal fields. With 4.8m t of coal used per year, the strip coal mines have since moved some kilometres away and the commodity is now trucked to the plant.

“SaskPower needs to figure out if coal can be part of the future; therefore we are trying CCS with BD3, then we will assess the technology and see if it meets the regulations and if it is cost-competitive,” says Zeleny.

“Lots of people want our CO2; it is in demand. Oil companies see it as a stable source in the long term and it could provide new EOR potential in the northern US.”

The plant will generate 1m t of CO2 in the autumn for commercial sale. Most of this will travel through a pipeline already in place 60 km away to oil fields, while some of it will go into storage, only three km away. Preference will be given for EOR applications; however, thousands of tonnes of CO2 are needed at the storage site to enable underground monitoring of the plume to validate storage.

**How it works**

For the Boundary Dam crew, recycling is high on the agenda. Combustion-generated heat is used in the building, while that from flue gas is caught with heat exchangers. After cooling, the flue gas condenses the 30 per cent moisture existing in the coal, which is used in a cooling plant.

Besides CO2, other byproducts produced by the plant include sulphuric acid and fly ash, which are also going to be stripped off and sold. Fly ash will be sold for concrete, says Zeleny. “Fly ash is in huge demand and this also reduces our environmental footprint.”

A large, silver duct joins BD3 with the CCS facility. While fly ash drops out under the building, all other emissions travel through to the facility. After travelling the long duct leading from Unit 3, the flue gas first enters a flue gas cooler, which lowers the gas temperature, allowing absorption to work, explains Zeleny.

“The SO2 absorber catches 100 per cent of the SO2, and the CO2 absorber 90 per cent (of the CO2),” he adds; different amines are used as SO2 and CO2 absorbers. The SO2 must be removed before the CO2 absorber can work.

“The amine absorption technology has been around for 50 years, but no one has built a plant this big,” says Zeleny. Because the amines capture other things as well, they need to be constantly purified through filtration.

In the CO2 stripper, CO2 in flue gas flows up and amine flows down, absorbing the CO2 in the flue gas. A pump takes the amine with the CO2 to a heat exchanger, where it is heated even more. At a certain temperature pure CO2 gas is released by the heat. On the way back, amine that has given up CO2 gas (hot amine) meets cool amine, which picks up more CO2 in a closed-loop process.

The amine is not dangerous to people, but still cannot be allowed to leak into the ground, points out Zeleny.
Wet CO₂ then enters a compressor building from the stripper at 40 pounds per square inch (psi), where it meets an eight-stage compressor with several thousand revolutions per minute (rpm) and becomes more and more pressurized. The extracted water goes on to dryers. The final result is CO₂ compressed to 2,400 psi, which heads out of the building through a surprisingly small pipeline and off to the oil fields or storage.

The SO₂ is extracted in the same way as CO₂, using a different form of the amine to release the pure product. Air and water are added to SO₂ to create H₂SO₄ (sulfuric acid), which is the most common acid sold. It is used in industrial processes, water treatment and fertilizers, says Zeleny. The 60 t/day that will be made available have also been pre-sold to a chemical company. The expectation is that sales of plant byproducts should be enough to cover costs eventually.

“Not on this plant, but we would have a 30 per cent savings on the next build,” says Zeleny. “I think it will be self-sufficient. It won’t need subsidies; the (federal government) won’t give subsidies.”

The only assistance SaskPower gets — due to its standing as a Crown corporation — is low interest rates. “Our business case stands on its own.”

Zeleny predicts the next plant build will take place not because of regulations, but because of CO₂ demand, with oil companies chomping at the bit, but at the same time waiting to see how the plant performs.

“We need to make the decision for Units 4 and 5 soon. We need the power. The government and Board of Directors have recognized we should be ahead of regulations.

“In a year, the Board will decide. We would lose 300 MW if we do not do it.” Importing gas as a replacement is a very expensive option.

**Learning curve**

Running a chemical plant is not normally on the slate of power companies, says Monea, but Boundary Dam has been on a learning curve. The company has created a training package second-to-none, he stresses, adding that it is being continually improved. In the future, the company may train CCS operators from around the world.

“Five hundred hours of classroom time are required for all operators before they can touch anything,” says Zeleny, adding that employees also work with a training simulator. “Because (the CCS plant) is first of a kind we have to figure out exactly how many people we need to operate it,” says Zeleny. “We figure about 55 with different skills from operators to trade people, engineers and administration.

“We have hired a lot of people and will hire a lot more. We want to make sure people are well trained before we start commissioning.”

The simulator training was of great importance, according to Zeleny, identifying many issues beforehand. “We could fix things before start-up ... a lot of issues are behind us already.”

Many power plants have a simulator, he adds, but this is the first one existing for CCS. Along with this, the company built and equipped three new labs to assist in every aspect of operations, along with the monitoring of water and airborne emissions: an amine lab, an acid lab (for quality control) and an air emissions lab.

“We can measure and monitor all aspects; in this business surprises are not good. The knowledge we will have is a tremendous tool,” states Zeleny, adding that constructing a CCS plant is only one part of the picture.

“There are 14 different aspects besides construction, from training to environmental licences, health and safety, etc. We had to consider every aspect that could pose a risk to employees.”

Teams came from around the province — both volunteers and experts in the field — and helped to bring the project to its current state, adds Zeleny.

“We have engineered the facility to add on CCS units for 4, 5 and 6 in the future if that’s the company’s decision. It has to be done on a unit basis to be effective.”
**Storage and EOR**

Although most of the CO₂ will be exported to the Weyburn–Midale oil fields, some of it will be put into storage for research purposes, says Zeleny. The Weyburn–Midale fields have already been involved in a CCS project for 12 years, in which CO₂ from the northern US is being pumped in for EOR and storage. The area currently holds about 20m t of CO₂.

In fact, the field is part of the largest research project in the world dedicated to CO₂ storage, operated by the Petroleum Technology Research Centre (PTRC) based in Regina, Saskatchewan, a non-profit corporation founded in 1998 to foster research and development into EOR and CO₂ storage. The centre is funded by oil companies, utilities, several different levels of government in Canada and the US and research partners from around the world.

The same research team involved with PTRC will be working on the Boundary Dam CO₂ Aquistore research and monitoring programme, in which captured CO₂ will be injected into a deep saline formation for storage at a depth of 3,400 m. The benefit for Boundary Dam is that if CO₂ cannot be taken by the oil companies for any reason, it can be diverted into permanent and safe deep storage, says Tremblay.

“Aquistore is a research and monitoring project to demonstrate that storing CO₂ deep underground (in a brine and sandstone water formation) is a safe, workable solution to reduce greenhouse gases,” states the PTRC website.

“The Weyburn–Midale project put Weyburn on the research map,” states Monea.

Zeleny adds: “This has everything from fantastic baseline work in geophysics to core work. All the information will be available for other countries to understand storage. The project here will help a lot of other countries.”

A parallel project for SaskPower has been the building of the Carbon Capture Test Facility (CCTF), which will test new post-combustion solvents and processes for the coal industry.

This smaller CO₂ capture test facility is located at the nearby Shand coal-fired generating station. Putting in a good-sized test facility was an important part of the plan, says Monea, adding that the facility — built about 10 km away from the plant — is one of the very few in the world associated with a coal plant.

“We can extrapolate up to 85 per cent of performance,” adds Monea. “If we see something questionable, we can test it at the facility first. We have instant credibility because we do not own the capture technology.”

When CO₂ is pumped into the earth, it is naturally sequestered, thus when CO₂ is used for EOR, half of it remains sequestered forever and half of it comes up with the recovered oil, where it is recompressed and reinjected, says Monea.

The injected CO₂ can create calcium carbonate or mineralization, he says. It is more dense and floats downwards, dissipating in brines and moving in solutions. The volume is reduced by 600 times because it is so compressed.

The effect of CO₂ on oil is unique. It is pushed into a reservoir at least 1,000–1,200 m deep. It changes when it meets oil, turning into an emulsion and swelling, causing pressure and reducing the viscosity of the oil.

“That is pretty incredible,” asserts Monea, adding that it also sweeps. “Nothing moves oil like CO₂,” he adds. It acts like a liquid and a gas — it flushes out the oil.

“It is amazing what it can do.”
At first, interested oil companies wanted SaskPower’s CO₂ for free because it is a greenhouse gas, laughs Monea. But times have changed. Four or five Canadian oil companies and two from the US have expressed interest in purchasing the CO₂, but all were cautious and none would commit, he says.

“When we were 50 per cent finished with the plant and close to being on budget and on time, things changed. In the last six months they changed more.”

Cenovus got there first and bought the entire 1m t a year of CO₂ for ten years. “They know their economics. Now they control the CO₂,” says Monea, who predicts that CO₂ EOR will be a huge source of EOR in the future. Texas has used natural CO₂ for 50 years, but natural sources are dying out, he says.

“For us, CO₂ is a side issue. We need to produce power.”

This is not only the biggest project for SaskPower, it will change how Saskatchewan does things in years to come, not only in power, adds Monea. Having a secure power demand for the next years would allow the company to expand its renewable power, he states. The company is looking at wind and geothermal power as possibilities for the future.

“It has to be cost-competitive,” affirms Zeleny. “We do not want to give the ratepayers a shock and we do not want to deter companies from moving here.

“The electricity and CO₂ will make up product sales that will prove or disprove viability and competitiveness.”

In the meanwhile, the plant is essential to meeting the booming province’s energy needs and one way or another the show must go on. But in doing that, SaskPower is also going beyond what is required in curtailing or reducing its environmental impact.

“We want to minimize our environmental footprint,” stresses Zeleny. “We all live here, my daughters grew up here … our drinking water comes from the reservoir providing the plants, and I drink it too!”

The community has been very supportive and a lot of jobs have been created in the region, says Tremblay. “People here have expectations … they want energy,” he states, adding that the population of the province has grown by 13 per cent in five years and the 2013 growth in power consumption was six per cent.

“Oil and agriculture are growing. About half of our customers need to double their consumption in the next decade.” Currently, 49 per cent of the province’s energy is used in industry, he adds.

“If not this, then what?” asks Zeleny. “What is cheap, palatable and also good for the environment?”

The world’s population is not diminishing, notes Monea. “The Third World wants what we have. They want warm or cool homes, they want basic things. To have that, we need power. We need it all — every kind of power.”

However, increasing power generation does not always go hand-in-hand with environmental protection, which is taking an ever-more prominent position on the international political agenda. It has become the number one issue in countries such as China, which is now turning to SaskPower for help to build its own CCS plant, continues Monea.

“This is serious. People are dying there,” he adds. “... we need to clean up the large point sources around the world.” Monea states that when CCS technology becomes more widely used, components can be more cheaply built and it will drive costs down, making it a real possibility for large-scale CO₂ reduction.

“I believe post-combustion capture is a viable option for the future,” he adds.

Images, unless otherwise credited, courtesy Maureen MacNeill.
Panama Canal ushers in a new centenary

Celebrating in August 100 years of facilitating global maritime trade, the Panama Canal has reduced voyage times and costs between the Atlantic and Pacific Oceans. The OPEC Bulletin reviews the impact of this famous waterway on the international petroleum industry and looks to what the future holds, especially for the gas sector.
**Question:** What does a 77-kilometre ship waterway in Panama linking the Atlantic Ocean to the Pacific Ocean have in common with the Great Pyramid of Giza and the Mausoleum at Halicarnassus?

**Answer:** They are all described as wonders of the world.

Nicknamed the eighth wonder of the world, the Panama Canal celebrated its centenary on August 15 with fireworks, a gala, and a four-metre chocolate-cake replica of the locks.

So far, there have been over one million transits during its 100 years of service. And two OPEC Member Countries — Ecuador and Venezuela — rely on the waterway to ply their oil trade.

Cargo liner SS Ancon, an American steamship, was the first to officially sail through the Canal on August 15, 1914.

Marking its second centenary during the August celebrations was Greek vessel Galini which voyaged from the Caribbean Sea to the Pacific.

Transiting the Canal shaves off almost 13,000 km in a ship’s journey which otherwise would have to go around the farthest tip of South America.

Today, the Canal plays a regional role with oil shipped from Venezuela, Ecuador and Colombia to refineries on the west and east coasts of the United States and other locations throughout Central America, South America and the Caribbean.

Petroleum and petroleum products accounted for 25 per cent of the cargo which passed through the waterway in fiscal 2013.

“Currently, about 1.3 per cent of global oil by tankers goes through the Panama Canal,” Michael Yo, analyst at the US Energy Information Administration (EIA), told the *OPEC Bulletin*.

This is because it is not on major oil trading routes. During the last five years, more than 125,000 barrels/day of crude oil and around 3,000 tonnes of liquefied petroleum gas (LPG) per day on average have been transported through the Canal.

An impressive engineering feat initiated by France in 1880 and abandoned because of spiraling costs, the Canal was completed by the US in 1914.

Around 56,300 workers brought the Canal to fruition, ushering in a new dynamic in world trade by reducing distances, times and costs in transporting goods between production and consumption centres. And since it began all-year-round operations in May 1963, the Canal has only closed for one day — when the US invaded Panama to capture Manuel Antonio Noriega.

**Milestones**

Trade on the Canal flourished between the east coast of the US to the west coast of the country, Central and South America and Asia.
Celebrate, celebrate

♦ Events worldwide have marked the centenary of the Canal.

♦ The Mint of Poland has created a .999 fine silver coin depicting the first vessel traversing the Canal.

♦ An exhibition of vintage photographs and rare maps covering its history are available at the Panama Canal Museum in the University of Florida.

♦ An Ocean to Ocean canoe race saw competitors spend three days paddling through the Canal from the Atlantic to the Pacific Ocean.

with the Texas oil boom that started in the 1900s and the opening of the Houston Ship Channel in 1914.

In addition, the destruction of the European manufacturing industry and infrastructure during World War I contributed to the US overtaking Europe as the industrial centre of the world.

This led to a rapid increase in demand for petroleum products as families relied upon kerosene to heat and light their houses, industries needed lubricants for their machinery, and the ever-more prevalent internal combustion engine demanded gasoline.

During the 1920s, the California oil boom displaced Mexico as the main source of supply for the eastern seaboard of the US. The movement of California oil through the Canal began in 1922, shifting temporarily trade from the Pacific to the Atlantic.

After that, the discovery and development of new and larger oil fields in the US, Canada, Mexico, Venezuela, Peru, Colombia and Ecuador changed the trade flows through the Canal.

In the 1940s, the average tanker size was 9,300 deadweight tons (dwt). The largest was about 22,000 dwt. This was mainly because of the shorter journeys between Venezuela, Mexico and the US, as well as several technical limitations.

Nonetheless, in the 1980s, the Middle East became the centre of oil production and growing demand, coupled with increased transport distances, became a driver for larger tankers. Presently, the Canal can admit 16 per cent of the world’s existing tanker fleet.

Future ambition

So what do the next 100 years hold? With the steep rise in shipping requiring passage through the Canal causing, on average, 20–30 hour bottlenecks and with the larger vessels being constructed, a $5.25 billion expansion project is underway.

This is expected to “change trade patterns just as the Canal opening did a century ago,” said Panama Canal Authority (ACP) Administrator, Jorge Quijano. A major difference will be the jump in the size of tankers that can navigate it — 56 per cent of the existing fleet and 44 per cent of the order book.

Widening and deepening the existing navigational channels in Gatun Lake and the deepening of the Culebra Cut will ensure that larger ships, post Panamax, can safely travel along the route.

Two new sets of locks, (427 metre long, 55m wide and 18.3m deep) — one each on the Atlantic and Pacific sides — will add a third lane, enabling greater cargo volumes to be transported.

The central aim is to double the capacity of the waterway to grab a slice of the growing international seaborne trade that is forecast to reach 10.3m tonnes in 2017 from 4.7 billion t in 1997.
Expansion of the Canal is expected to be completed in 2015, having fallen behind its initial target date of this summer due to strikes by construction staff and a $1.6bn cost overrun between the ACP and the European contractor, Grupo Unidos por El Canal, in building the locks.

The Canal will be capable of handling up to 600 million tons of cargo per year after the expansion work is finished.

“For oil and product tankers, Panamax vessels, the largest vessels that can transit the Panama Canal, have a maximum size of approximately 70,000–80,000 dwt,” José Arango, Senior International Trade Specialist at ACP, told the OPEC Bulletin.

“Once the Panama Canal expansion starts operations, the new set of locks will allow the transit of Suezmax oil tankers of 150,000 dwt, depending on the amount of consumables onboard on arrival at canal waters before transit,” he added.

LNG impact

What is particularly exciting for the gas industry is the possible role the expanded Canal could play in connecting US shale gas to international markets as the unconventional gas revolution there has opened up a world of possibilities for liquefied natural gas (LNG) exports.

From just seven per cent of the global LNG fleet being able to navigate the waterway today, this will surge to nearly 90 per cent following the completion of the Canal’s expansion work.

Global market intelligence company, Industrial Info Resources, estimates that more than 39m tons per year of LNG could be sent abroad considering that so far three export terminals in the Gulf Coast have received export permits.

More projects, which are zoning in on prime Asian markets, are awaiting sign off from the Federal Energy Regulatory Commission, leaving it unclear as to the extent of the status of the US as an LNG exporter.

Other factors to also impact it are how the US government’s LNG export policy develops, the rise of LNG usage in China, demand and supply of gas in Latin America, and competing projects in Australia.

Analysis by the IHS information group suggests that the US trade position will continue to improve, owing to the significant

Number crunchers

| +1 million | Transits through the Canal since 1914. |
| 56,307 | The number of people who worked on the canal construction from 1904 to 1913. |
| 25% | Of goods shipped through the Canal were petroleum and petroleum products in fiscal year 2013. |
| 24% | Maritime sector’s contribution to Panama’s GDP. |
reduction in energy imports and the increased global competitiveness of US-based energy-intensive industries.

José Arango explains: “The shale revolution has become a major game changer for American oil and natural gas production, as new unconventional extraction techniques, such as fracking, have given the US access to relatively inexpensive domestic oil and gas, making it change from a net importer to a net exporter of petroleum products and LNG.

“This change in trading patterns is complemented with the Panama Canal expansion project,” he maintained.

LNG shipping costs could be cut by 25 per cent once the Canal can accommodate larger vessels.

However, competition is also on the horizon from a proposed 277 km canal through Nicaragua led by the Chinese who wish to connect with the east coast of the US. Digging is scheduled for the end of 2014. And there are plans to widen the western channels of the Suez Canal from 48 ft to 52 ft to reduce transit times.

Innovation and cutting edge structural, geotechnical, hydraulic and sanitary engineering with the Panama Canal have provided the foundation to create a conduit that is pivotal to global seaborne commerce.

Its dogged expansion leaves this modern wonder of the world at a crossroads in facilitating the world’s future economic growth. However, if it all works to plan, the international petroleum sector — particularly gas trade — will continue to reap the benefits.
Angola’s petroleum development activities have been given a considerable boost with the news that the BP Group plans to invest heavily in the OPEC Member Country’s oil fields in the coming years.

BP has announced on its website that it intends to invest $20 billion in the exploration of new oil fields in the African country over the next ten years. It will also invest in the domestic educational sector.

The multinational has already invested over $25bn in its Angolan development activities.

BP Marketing Director, Amilcar da Costa, was quoted as saying that the company had a long-term commitment in Angola and not solely related to petroleum.

“In order to have a sustainable business we continue investing in education and other projects to support business, social inclusion and combatting poverty by offering training to people,” he stressed.

BP currently backs numerous educational schemes in Angola, including partnerships with schools, universities and non-governmental organizations.

According to its website, BP said Angola was one of the fastest-growing businesses in its exploration and production portfolio.

BP is the operator of blocks 18 and 31 in the deep and ultra-deep waters of the Congo basin and blocks 19 and 24 in the Kwanza and Benguela pre-salt basins.

It also holds non-operating participation in blocks...
15, 17, 20, 25 and 26, as well as in the Angola liquefied natural gas (LNG) project in Soyo.

BP participates in production-sharing agreements with the Angolan state oil company, Sonangol, which is the concessionaire granting rights to the exploration and production of oil and gas to contractor groups formed by the block operator and its participants.

BP Angola's net average crude production stands at around 200,000 b/d, coming from blocks 15, 17, 18 and 31.

Angola’s total crude oil production in August stood at 1.71 million b/d, according to data communicated directly to the OPEC secretariat in Vienna. This was relatively stable with July’s level.

**Local workforce**

BP employs 1,000 staff based in Angola, of whom more than 70 per cent are locals. “We recruit talented people and develop them in order to be the technicians, engineers, and leaders of the future,” said its website.

The company says it is committed to building a safe, reliable and sustainable operating company in Angola that enhances exploration and production returns and contributes to the social and economic development of the country.

“BP is committed to building local capability by investing in the development of the local human resources, enhancing the capability of local companies, and creating strategic partnerships for institutional and social development,” it said.

BP's links with Angola, which actually date back to the 1970s, took a substantial turn in the 1990s when the company gained extensive interests in the offshore deep and ultra-deep waters of the Congo basin following a merger with Amoco.

BP acquired further interests in five new deep and ultra-deep water blocks in the Kwanza and Benguela basins in 2011, giving the company a leading position in Angola with interests in nine blocks accounting for a total acreage of 32,650 square kilometres, making the 'Angola Region' one of the most important assets in BP’s exploration and production portfolio.

Its website stressed that BP Angola aimed to be involved in Angolan communities “at every level” and to bring real benefits to the country.

The BP Angola Community Investment programme supported the country’s overall goal to diversify the domestic economy by investing in human capital.

“**The BP Angola sustainable development and community investment programme** focuses on education, enterprise development, and social inclusion. The company is working closely with Agostinho Neto University in Luanda to help increase the number of qualified future professionals that graduate each year, so as to meet both the development needs of the oil sector and of the country as a whole.

“**This is achieved by investing in laboratories and staff capabilities to enable the university to serve the community and prepare its students for the market.**”

It said that, in addition to this, BP was funding a fully-credited postgraduate programme, leading to the award of a Master’s of Law Degree (LLM) in Oil and Gas.

“**The programme is a partnership with the Faculty of Law of Agostinho Neto University. It was launched in April 2007 and has produced over 100 graduates to date. The programme aims to develop a local network of petroleum law expertise in Angola,**” it added.
Algeria has announced an ambitious plan to boost the nation’s oil and gas capabilities in the years ahead, including the development of shale gas.

Sonatrach, the Algerian state energy company, has given the green light to a five-year investment plan costing $100 billion and starting this year.

It aims at increasing the OPEC Member Country’s oil and gas output, and facilitating the start of shale gas production in 2020, according to the state-owned Algerian Press Service (APS).

Algeria, which has seen its petroleum output plateauing over the past few years, relies heavily on oil and gas revenues for supporting its socio-economic programmes.

The country also suffered a setback in its capacity-expansion plans when militants attacked a BP-Statoil gas facility in the country in 2013, resulting in the deaths of 37 foreign hostages. The attack left the country’s energy sector shaken as international firms began to reassess their presence there.

Considerable investment

However, energy officials are now hopeful that things will improve, especially with the announcement of the considerable investment in the petroleum sector over the next few years.

According to the Sonatrach plan, $42bn will be allotted to helping develop the country’s oil and gas fields. In that figure, $22bn is earmarked for natural gas development activities.

Over the next three years, Sonatrach will start production from six gas fields with a total output capacity potential of 74 million cubic metres/day.

In September, Algeria is scheduled to open bids for a new oil and gas licensing round, with 31 fields on offer.

And for the first time in its petroleum history the country will include blocks containing unconventional oil and gas resources, accompanied by tax incentives for interested companies.

APS pointed out that the country’s energy officials were optimistic that domestic shale gas potential was significant. Starting in 2020, initial output of around 30bn cu m per year was forecast.

According to the United States Energy Information Administration (EIA), Algeria was home to the world’s third-largest shale deposits after China and Argentina with 707 trillion cu ft, although this remained unproven.

Algeria has reported promising hydrocarbon production results for the first quarter of this year.

Official figures showed that, as new projects went onstream, domestic hydrocarbons output increased by 13.5 per cent in the first three months of 2014, compared with a ten per cent decline in the same period last year.

According to the National Statistics Office, oil and gas production in the period improved by 5.1 per cent, while output of LNG surged by 19.9 per cent, backed by the government’s announcement of the start-up of a new LNG export plant at Skikda. The data also showed that domestic output of refined oil products in the first quarter rose strongly by 61.1 per cent.

The domestic refining sector has also received a boost with the news that the country’s largest oil refinery had increased throughput following extensive maintenance work.

Algeria’s crude oil production in August stood at 1.2 million b/d, according to data submitted directly to the OPEC Secretariat in Vienna, relatively steady over the past three months.

Meanwhile, Said Sahnoun has been appointed as the new Chairman of Sonatrach, succeeding Abdelhamid Zerguine. Sahnoun was formerly the company’s Vice President for Production.
Iran postpones oil bid round to give all companies chance to take part

Iran is pinning its hopes on getting the international sanctions imposed on the country lifted by early next year so that it can get the best response possible to its planned oil bidding round.

The OPEC Member Country, which has been the subject of Western sanctions for many years as a result of a dispute over its domestic nuclear programme, had initially planned to hold the oil round roadshow in London at the beginning of November this year.

However, Mehdi Hosseini, Head of the Iranian Oil Contracts Revision Committee, announced that this date would have been too soon to enable all relevant oil companies to participate in the round.

Iran and six world powers — China, France, Germany, Russia the United Kingdom and the United States — who are attempting to draw up an amicable, workable deal, have said they want to reach an agreement on the sanctions' removal by November 24.

“We want to provide for all the companies to participate and we know they will have difficulties before November 24,” Hosseini was quoted by the Reuters news agency as saying.

He revealed that the London oil bidding conference was now scheduled to take place in February next year.

Hosseini expressed hope that his country would reach a comprehensive deal with the world powers by the deadline, adding that companies in the US had the most problems legally because of the sanctions.

Better to postpone

“We thought it would be better to postpone the conference to provide an opportunity for them and all foreign companies to come back,” he affirmed.

Hosseini said earlier that Iran expected the London roadshow to be successful, adding that he personally thought the nuclear negotiations would end with a good result.

He disclosed that Iran’s new oil contract — known as the Iran Petroleum Contract (IPC) — would be over a longer time frame than the previous ‘buyback’ arrangement.

The country has previously hinted that the duration of the contracts could be as long as 25 years, in a bid to persuade the top companies to return.

Iran, noted Hosseini, was in line to offer more than 20 new schemes in a combination of exploration, green and brown fields.

“Our model will provide flexibility and can be fitted depending on the project,” Reuters quoted him as saying.
Kuwait looking to double its crude oil exports to China

With Kuwait’s oil capacity expansion plans on track, the OPEC Member Country is looking to substantially increase its crude oil exports to energy-hungry China over the next few years.

According to Nasser Al-Mudhaf, Managing Director of International Marketing at the Kuwait Petroleum Corporation (KPC), the country hoped to be able to boost its crude oil exports to China to 500,000 barrels/day in three years, he was quoted as saying by the official Kuwait News Agency (KUNA).

Kuwait has just reached a new ten-year agreement with the Sinopec Corporation of China, under which it is committed to virtually double its crude oil supplies under more competitive terms.

Al-Mudaf pointed out that the new contract replaced a previous agreement covering deliveries of 160,000 b/d to 170,000 b/d that had expired.

Under the terms of the new deal, KPC will initially export 300,000 b/d of crude oil, representing around 15 per cent of Kuwait’s current oil exports.

Al-Mudhaf told KUNA that the contract was not related to an ongoing joint project between KPC and Sinopec for the construction of a 300,000 b/d refinery. Feedstock for the plant would be also supplied by KPC when it went onstream.

“Extra crude oil imports from Kuwait will help feed China’s growing transportation sector.”

With new and mutual cooperation between the two parties, there is a good sign of increasing the volume of our crude oil exports to China up to 500,000 b/d in the next three years,” he affirmed.

The KUNA report quoted July government data as saying that Kuwait’s crude oil exports to China in the first half of this year stood at 3.87 million tonnes, equivalent to around 157,000 b/d.

“We look for the best markets which have stability and give a high return to KPC,” Al-Mudaf was quoted as saying.

He added that the agreement with Sinopec’s trading arm, Unipec, was reached “in accordance with international prices and under purely commercial terms.”

Kuwait plans to boost its domestic crude oil production capacity to 4m b/d by 2020, compared with around 3.2m b/d at present.

Cooperation enhanced

“If the joint venture materializes, China-bound shipments may hit 800,000 b/d,” he affirmed.

Extra crude oil imports from Kuwait will help feed China’s growing transportation sector.
The Nigerian indigenous oil and gas exploration and production company, Oando, has taken a giant leap forward in boosting its regional standing by buying the assets held in the West African OPEC Member Country by ConocoPhillips.

The $1.5 billion deal covers the acquisition of the US company’s upstream oil and gas business interests in Nigeria.

Oando said it believed the transaction would provide the company with a platform for future growth in the region. The deal also represented a significant opportunity for the firm to create scale and significant value for its shareholders.

“This transaction represents a transformational leap forward for our company and is in keeping with our overall strategy to grow our portfolio of Nigerian-based assets by focusing on those opportunities that deliver high quality growth in reserves and production,” commented Pade Durotoye, Oando’s Chief Executive Officer.

Managerial experience

“Our management team is familiar with these assets and possesses the managerial experience and technical expertise necessary to unlock their value for our shareholders,” he stated.

Meanwhile, the company’s Chairman, Wale Tinubu, said: “We believe in the significant potential that the Nigerian oil and gas industry holds and are privileged to play a pivotal role in its consolidation, growth and development.

“We will continue to seek strategic opportunities that provide a platform for enhanced growth and value creation for our stakeholders,” he added.

Tinubu said he was looking to boost Oando’s production to 100,000 barrels/day of oil equivalent from the current 46,700 b/d.

The move is also a success for Nigerian authorities, who, over the last few years, have been pushing local firms to become more prominent in domestic oil and gas dealings.

Tinubu maintained that indigenous participation in Nigeria’s petroleum sector would also help the country deal with issues such as oil theft, pipeline sabotage and regulatory uncertainty, all of which were preventing investment from foreign parties.

The company stressed that, through the acquisition, higher oil and gas recovery factors were expected to be achieved with a focused and committed development programme.

“Oando believes there are many opportunities to further develop the existing fields and increase production,” the firm stated on its website.

It believed there was significant upside potential from an active exploitation and exploration programme on the onshore and offshore assets acquired.

Nigeria has 37.1bn b of proved reserves, (according to the OPEC Annual Statistical Bulletin for 2014), a large proportion of which is located in the Niger Delta region.

Within this area, there are a large number of discovered but undeveloped fields with significant upside potential. Oando believed that the centrally located Brass River Terminal, Obiafu-Obrikom (Ob-Ob) gas plant, and associated pipeline network offered a significant opportunity to capture additional third party production, transportation and processing business.
In a landmark move, Saudi Arabia plans to open its stock market, the largest in the Arab world, to direct foreign investment in the first half of next year.

Saudi Arabia’s cabinet has given permission to the country’s financial regulator to open the stock market to direct investment by foreign financial institutions.

“The market will be open to eligible foreign financial institutions to invest in listed shares during the first half of 2015, with God’s permission,” the Capital Market Authority (CMA) announced in a statement.

CMA said it would soon publish draft regulations for the reform and then hold a 90-day consultation period.

Index compiler, MSCI, said it would consult with investors about adding Saudi Arabia to its broader stock indices and could place it on review for classification as an emerging market in June 2015.

With GDP growth at four per cent, a dividend yield of three per cent and backed by firm and relatively stable crude oil prices, Saudi’s bourse opening is seen as being extremely promising.

According to a report by the Reuters news agency, the opening of the Saudi market, capitalised at around $530 billion, was one of the most keenly awaited economic reforms in the largest oil-exporting nation. The bourse would be one of the world’s last major exchanges to begin welcoming foreign money.

It pointed out that Saudi authorities wanted to open the stock market to create jobs, diversify the economy beyond oil and expose local firms to more market discipline.

**Huge interest expected**

Currently, foreigners other than citizens of nearby Gulf states were limited to buying Saudi stocks via swaps involving international banks and through a small number of exchange-traded funds, which were expensive and inconvenient options.

The report stressed that potential foreign interest in the Kingdom’s stocks was huge because of its strong economy.

The Kingdom was also home to some of the region’s top blue-chip firms, including the Saudi Arabian Basic Industries Corporation (SABIC), one of the world’s largest petrochemicals groups, the National Commercial Bank, Saudi Arabia’s biggest lender, Saudi Telecom and food giants, Savola and Almarai, all of which offered attractive propositions.
Venezuela is taking steps to strengthen its ties with fast-growing China, one of the most important markets for energy supplies now and in the years ahead.

Under an agreement signed by the President of the Bolivarian Republic of Venezuela, Nicolas Maduro Moros, and his Chinese counterpart, Xi Jinping, who visited the OPEC Member Country in July, China will extend a new $4 billion credit line to Venezuela, with the money to be repaid in oil deliveries.

The money will be held in the Joint Chinese-Venezuela Fund, which supports spending on Venezuelan infrastructure and socio-economic development.

According to the government, the Fund currently has proceeds amounting to over $40bn, with the Venezuelan President stating that the government had also put a considerable cash injection into the account.

Virtuous formula

Officials were quoted by the Reuters news agency as saying that the latest credit from China would be repaid by shipments of around 100,000 barrels/day of crude oil and products.

“It is a virtuous (financing) formula which does not create onerous debts,” the Venezuelan President was quoted as saying about the fund. “We have reached the point of no return in a deep relationship with China.”

Petroleos de Venezuela SA (PDVSA), the national oil company, said the country’s oil exports to China currently stood at around 524,000 b/d. This was expected to almost double by 2016.

According to figures quoted by officials, bilateral trade between Venezuela and China has increased to over $19bn annually. In 1998, it stood at just over $180 million.

During his brief stay in Venezuela, the Chinese President pointed out that his country’s economy continued along solid development lines and was in fine condition to keep growing.

“China will be a cooperation partner for all countries of the world like Venezuela,” he affirmed.

The Reuters report noted that Chinese business concerns were involved in transport, housing, education, electricity, communication and vehicle-assembly projects in Venezuela.

It stated that among 38 accords signed during the Chinese President’s visit was a memorandum of understanding for China’s EximBank to lend $1bn to PDVSA, an agreement for mineral exploration, the purchase of 1,500 Chinese buses and the creation of a new cement factory.
In the course of his official duties, OPEC Secretary General, Abdalla Salem El-Badri, visits, receives and holds talks with numerous dignitaries. This section is dedicated to capturing those visits in pictures.

Erratum

Pictured is Abdelhadi Abdelwahid Alkhajah (l), Ambassador of the United Arab Emirates to Austria, who visited Abdalla Salem El-Badri, OPEC Secretary General, on July 1, 2014.

In the July 2014 OPEC Bulletin it was mistakenly indicated that this was Kairat Sarybay (l), Ambassador, Permanent Mission of the Republic of Kazakhstan, who actually featured in the June issue of the publication.

We apologize for any inconvenience caused.
Students and professional groups wanting to know more about OPEC visit the Secretariat regularly, in order to receive briefings from the Public Relations and Information Department (PRID). In some cases, PRID visits schools to give them presentations on the Organization and the oil industry. Here we feature some snapshots of such visits.

**Visits**

Students from the Integrierte Gesamtschule Mühlenberg, Hannover, Germany, visited the OPEC Secretariat on June 23, 2014.

Students from the Global young leader conference, visited the OPEC Secretariat on July 2, 2014.

Students from the Modellschule Obersberg, Bad Hersfeld, Germany, visited the OPEC Secretariat on July 9, 2014.
Students from Latinomics, visited the OPEC Secretariat on July 15, 2014.

Youth officers from German Bundeswehr Regensburg, visited the OPEC Secretariat on July 22, 2014.

Youth officers from the German Bundeswehr Würzburg, visited the OPEC Secretariat on July 23, 2014.

Students from the Europäische Akademie Bayern, Munich, Germany, visited the OPEC Secretariat on July 24, 2014.
Students from the Moscow State University of International Relations (MGIMO), Moscow, Russia, visited the OPEC Secretariat on July 31, 2014.

Students participating in the 2014 Munich-Vienna Middle East Summer School, visited the OPEC Secretariat on August 12, 2014.

Students from AZTEC Training and Consulting, visited the OPEC Secretariat on August 19, 2014.

Another group of students from AZTEC Training and Consulting, visited the OPEC Secretariat on August 26, 2014.
OFID expands operations in Latin America and the Caribbean

Since extending balance of payments support to five Latin American countries in 1976, The OPEC Fund for International Development (OFID) has expanded its partnership in the region to 31 nations and channelled development financing worth a total of $2.2 billion. The institution’s Quarterly magazine recently spoke with Anajulia Taylhardat, Head of OFID’s Public Sector Operations on the continent, about the challenges of working in a region with increasingly diverse needs.

Question: What are the defining characteristics of OFID’s partnership with the countries of Latin America and the Caribbean?

Answer: The region is one of great contrasts. Nearly all countries are ranked middle income, but poverty remains widespread with 28 per cent of the population living below the poverty line and 12 per cent in extreme poverty. Most are blessed with abundant natural and human resources but face huge inequality in wealth and per capita income. And while some of the emerging economies have become important global players, others continue to struggle with widespread poverty and state fragility.

OFID seeks to address these diverse needs in a number of ways. First and foremost, we aim to reach out to the most vulnerable and unattended segments of the population. Thus we are heavily involved in poverty alleviation projects, social infrastructure improvement, support to social development funds, and assistance in the aftermath of natural disasters. Secondly, we seek to foster our partner countries’ economic transformation and competitiveness by supporting the expansion of infrastructure and the quality of human capital, and by facilitating access to trade finance instruments. A further distinctive characteristic of OFID’s partnership with the region is that by virtue of its constituency, OFID has a privileged position in promoting Arab-Latin American cooperation.

How has OFID’s relationship with the region evolved over the years?

Let me start by referring to the origins of OFID’s collaboration with the region. In fulfillment of our mandate, our support was initially geared towards balance of payments support, with El Salvador, Guatemala, Guyana, Haiti and Honduras among the first countries to benefit from OFID
assistance in August 1976. The move to project financing came in August 1977 and marked the beginning of combined financial and technical assistance aimed at achieving long-term economic and social benefits. In 1999, we broadened our support to embrace the region’s private sector, in particular small and medium-size enterprises, and in 2006, we added our trade finance facility. Throughout this time, our grant resources have complemented our mission to target the neediest. We like to think that our total contribution — which in financial terms amounts to some $2.2bn — has contributed to reducing poverty and inequality in the region.

Are there challenges in LAC that are peculiar to the region and that require a tailored response?

Today, the region is home to 167 million poor people and has an urbanization rate of 80 per cent, one of the highest in the world. Some 30m citizens lack access to electricity and 47m suffer from hunger. And while nearly 96 per cent of Latin Americans now have access to a clean water source, considerable investment is required to protect water security. This is where OFID’s priority focus on the water-food-energy nexus comes as a well-timed response. To support the nexus, we are channeling funding to the water and sanitation and energy sectors, as well as to rural development programmes.

There is also the issue of the region’s comparative advantage in the wealth of natural resources being undermined by the lack of proper infrastructure to both process and export its commodities. Here, OFID’s response is to consistently support initiatives that improve competitiveness and productivity. Such initiatives also support the mobility of people, thereby promoting the integration of isolated communities and enhancing their income opportunities.

In terms of share of total commitments, how does OFID’s support to LAC compare with that to other developing regions?

An increasing portion of the resources available for public sector lending have been dedicated to the region. Today the LAC region receives approximately 20 per cent of these resources, compared with just below ten per cent at the beginning of the millennium. Across all financing mechanisms, commitments to the region represent 13 per cent of total cumulative commitments and benefit 31 partner countries.

How does OFID distribute its support among the countries of the region?

OFID aims at participating in the development and economic growth of all eligible countries of the region. The distribution of available resources is based on the size of the country’s economy and population, its per capita income and the country’s performance with OFID.

Does OFID have priority sectors in the region?

Priority sectors for OFID development assistance stem from the dialogue with our partner countries and reflect their national development plans and poverty reduction strategies.

That said, in order to achieve higher sustainable growth rates, OFID prioritizes those sectors that improve productivity and the wellbeing of the population. For this reason, investments in the energy, transportation, water supply and sanitation sectors.
Agro-industry is a vital contributor to GDP in LAC. What is OFID doing to support this important sector, especially with regard to reducing rural poverty?

OFID has provided support — direct and indirect — to the development of the agriculture sector of nearly every country in the region. Direct support is generally undertaken in partnership with the International Fund for Agricultural Development (IFAD) for integrated rural development programmes, which take a multi-dimensional approach to rural poverty alleviation. Indirect support includes the rehabilitation of feeder roads and export corridors to unlock isolated rural areas, as well as small-scale irrigation schemes and rural credit facilities. Although the cumulative amount approved in support of the development of the rural communities represents 12 per cent of the committed resources in the region, the multiplier effect of these resources is extensive: value-added agricultural output, revenue-generating employment opportunities — in particular for women and minority groups — improved soil and natural resources usage, access to rural credit schemes, promotion of local markets and integration to the value chain, to name a few.

In LAC, over 30m people — seven per cent of the regional population — live without grid-connected electricity, while 85m — 19 per cent of the population — is without clean cooking facilities.

One of the challenges is that future energy demand in electricity alone will require between $1.33 trillion and $1.36tr of cumulative investment from 2010 to 2050. The additional resources set aside under the EPI have enabled us to step up our response to this urgent and growing need.

Since its launch we have channeled increased support to electricity generation, transmission, distribution, efficiency and interconnection.

Furthermore, indirect financing has been provided in the framework of operations in other sectors which have a direct contribution to improved access to sustainable energy services.

How is OFID implementing the principles of the Global Partnership for Effective Development Cooperation in LAC?

OFID is working both independently and with its fellow members of the Coordination Group of Arab Institutions, the Islamic Development Bank and OFID to implement the GPEDC principles of country ownership, focus on results, inclusive partnerships, and transparency and accountability. OFID represented this Group at the first high-level meeting of the GPEDC in Mexico this April and will continue to do so as a recently appointed full member of the GPEDC steering committee.

In LAC, OFID is constantly improving the quality and efficiency of its support, recognizing the importance of country systems and of harmonizing procedures and approaches. Numerous OFID-supported projects in LAC, as elsewhere, promote regional integration and reap the benefits of triangular cooperation.

These are some key inputs that OFID has identified to strengthen the formulation of projects, whose results will have a tangible developmental impact in LAC, as in all our partner countries.
**Ramping up support for private sector trade**

OFID’s private sector and trade finance operations in Latin America and the Caribbean (LAC) have ramped up significantly during the past years, according to Tareq Alnassar, Head of OFID’s Private Sector and Trade Finance Operations.

He said that total approvals amount to over $560m, with more than $220m committed between 2012 and mid-2014. The 46 projects approved so far span over ten countries. Peru, El Salvador and Colombia are new countries recently added to the portfolio of approvals.

“A high percentage of the approvals consists of financing facilities to the financial sector of the recipient countries,” he affirmed. “Through these facilities, OFID strengthens the concerned financial institutions and ensures access to funding for micro, small and medium-scale enterprises.”

Alnassar pointed out that these enterprises typically account for almost 80 per cent of jobs in their economies and are the prime engine of economic growth and increased productivity.

“Access to affordable and reliable sources of energy is critical for development. To address the prevailing energy deficit in the region, OFID’s private sector has extended loans to the renewable and conventional energy sectors. In the context of food security and to support the agribusiness sector and ensure that value is added in the agro supply chain locally OFID has extended loans to both agribusiness production facilities and agro-related logistics support services.”

**Importance of OFID’s grant financing**

OFID grants extended to eligible countries in the Latin American and Caribbean (LAC) region aim at supporting high-impact, sustainable interventions in less developed economies, such as those of Haiti, Nicaragua, Bolivia, Honduras, Cuba, Guatemala or El Salvador, according to Rachid Bencherif, Head of OFID’s Grants Unit.

He said that since OFID’s inception, grants have covered all sectors of development in the LAC region.

“Currently, our projects revolve around three key sectors: agriculture, water and energy.”

OFID has ongoing or recently completed projects in agriculture with centres affiliated to the Consultative Group on International Agricultural Research (CGIAR), mainly for enhancing food security in the neediest countries.

Concerning projects in the water and sanitation sector, two grants have been recently approved for vulnerable populations in Haiti and Bolivia.

Bencherif noted that, in the energy sector, OFID has developed innovative schemes, such as an ongoing project with the Andean Development Corporation (CAF), in which OFID grants are leveraged with matching funds from CAF through a facility commonly managed by the two institutions to finance feasibility studies and national master energy plans.

“This scheme is currently supporting a study to evaluate the hydroelectric power potential of Bolivia, which has one of the highest number of people living without electricity in the LAC region (around two million),” he affirmed.

Bencherif stressed that the study is an essential prerequisite to addressing Bolivia’s widespread energy poverty.
OFID scholarship programme rewards outstanding individuals in 2014 awards

Education is fundamental to the development and advancement of young people globally. That is the core principle of the scholarship programme run by the OPEC Fund for International Development (OFID). It enables outstanding individuals from the developing world to become agents of change in their countries. This article on 2014’s award winners is by Justine Würtz and Reem Aljarbou, who both work in the Information Department at the Vienna-based institution.

As well as being a prerequisite for human and economic development, education plays an important role in social cohesion, democracy, peace-building and human rights.

In recognition of this, OFID supports a variety of education projects, from the construction of schools, technical colleges and universities to teacher training and capacity-building.

Alongside such efforts, OFID has operated its scholarship programme since 2007. The programme strives to support human capacity-building in developing countries by enabling the fulfilment of the academic aspirations for those who have proved themselves committed to their own and their countries’ betterment.

Recipients of the OFID scholarship award receive funding to complete a development-related Master’s degree at top academic institutions.

As in previous years, OFID was again flooded with applications in 2014, with prospective students from over 166 developing countries vying for a place on this year’s programme.

In total, over 10,000 undergraduate students and young professionals applied and the process of reviewing each application fairly and thoroughly took over two months.

The 2014 award is presented to one student from each of four regions: Africa, Asia, Latin America and the Caribbean, and Europe.

OFID’s 2014 scholars are outstanding young individuals who have shown courage and commitment in their academic and personal lives and who illustrate the aspirations of sustainable development through human capacity-building.

The members of the OFID scholarship committee were themselves “truly humbled” by the outstanding achievements of so many individuals. They agreed that the successful applicants this year stood out by way of their commitment, passion and integrity and “we are honoured to name them as 2014 OFID scholars.”

Khaled Mokhtar Ibrahim Mohamed

The OFID 2014 scholar from the Africa region is 24-year-old Khaled Mokhtar Ibrahim Mohamed from Sudan, who will pursue a Master’s degree in environmental engineering and sustainable development at Imperial College, London.

Khaled’s interest in this area originated during the
last year of his Bachelor’s studies in engineering at the University of Khartoum when the Darfur crisis began.

“The conflict in Darfur has been driven by climate change and environmental degradation, which threaten to trigger a succession of new wars across Africa unless more is done to contain the damage,” stated Khaled.

Recognizing the significance of environmental issues on social stability, Khaled focused his final year dissertation on the subject of ‘Sourcing Water in Darfur’.

“The crisis structured my view of what I might do and how I can contribute to solving Darfur’s problems through engineering,” he said.

Khaled has been working as a teaching assistant at the university where he studied and hopes to use his strong academic skills to continue his research, with the aim of applying in-depth knowledge and engineering solutions to alleviate environmental and climate issues in Sudan.

When notified of his selection as an OFID scholar, he promised: “I will live up to the responsibility of being selected as a winner of the award.”

**Alaa Alaizoki**

Representing Asia in the 2014 cadre is 29-year-old Alaa Alaizoki from Syria, who will take up his place on the University of Birmingham’s (United Kingdom) Master’s programme in food safety, hygiene and management.

Alaa obtained his Bachelor’s in food engineering at Al-Baath University, Syria, where he learned about the relationship between food and public health. Since graduating he has worked as a food and health inspector for the Department of Health Control in the city of Hama.

Alaa said he was “motivated by a deep desire and aspiration to develop my knowledge and experience.”

He volunteered for the Aga Khan Foundation to help with UNICEF relief efforts focusing on children with malnutrition.

“I believe that I can be a great help to my country in the current situation and the future,” Alaa stated.

On learning that his application had been successful, Alaa declared: “I am honored to be selected and look forward to completing my programme with excellent grades and to helping develop my country.”

**Maja Pecanac**

Twenty-nine year-old Maja Pecanac from Bosnia and Herzegovina is the OFID scholar from Europe. She will attend the School of Oriental and African Studies at the University of London, to pursue a Master’s in human rights, conflict and justice.

Maja is currently a national legal officer at German International Cooperation (GIZ) and a self-proclaimed “advocate for making high-impact social change to benefit both the work and the greater good.”

She has a history of volunteering with numerous programmes and NGOs, through which she has learned and experienced key human rights issues including poverty, public health, gender, and children’s rights.

The strongest influence in her life has been the experience of war in her hometown Sarajevo: “I learned of ethnic, religious, racial and ideological distinctions when I started to be judged in accordance with what those presumably meant,” she stated.

Maja has committed herself to using her legal skills to raise awareness and promote opportunity. “What I have learned is that people who make a difference in the world have both passion and knowledge,” she said.

**Maldon Goodridge**

From the Latin America and Caribbean region, OFID’s 2014 scholar is 26-year-old Maldon Goodridge from Barbados, who will be studying for a Master’s in sustainable energy technologies and operational research at the University of Southampton, England.

Maldon is a visionary and committed to finding sustainable solutions for his region’s energy poverty issues and, in so doing, contribute to global commitments to solve energy concerns.

“I plan to help my country, Barbados, shape and execute its sustainable energy policy,” he declared, adding that his ultimate goal was “to further the development of optimum energy solutions, not just locally or regionally, but internationally.”

When informed of the award he admitted to being “truly humbled and grateful for the opportunity granted to me by OFID.”

All images courtesy OFID.
Forthcoming events

**Excellence in behavioural safety – oil & gas 2014**, October 13, 2014, Abu Dhabi, UAE. Details: Euro Petroleum Consultants Ltd, 44 Oxford Drive, Bermondsey Street, London SE1 2FB, UK. Tel: +44 207 357 8394; fax: +44 207 357 8395; e-mail: enquiries@europetro.com; website: www.europetro.com; event: www.behavioursafety2014

**China oil and gas infrastructure convention 2014**, October 14–15, 2014, Beijing, PR of China. Details: BMC China Exhibition Co Ltd, Building #7 Shuangxin Administrative Area, Beixinzhuang Road, Sijiting Town, Haidian District, 100093 Beijing, PR of China. Tel: +86 10 62 73 07 05; e-mail: sky.xia@gmc-china.cn; website: www.bmc-events.net/en/me-138197772660.aspx

**Operational excellence in oil, gas and petrochemicals**, October 14–15, 2014, Abu Dhabi, UAE. Details: Euro Petroleum Consultants Ltd, 44 Oxford Drive, Bermondsey Street, London SE1 2FB, UK. Tel: +44 207 357 8394; fax: +44 207 357 8395; e-mail: enquiries@europetro.com; website: www.europetro.com/en/opexmena14

**Asia Pacific oil and gas conference and exhibition**, October 14–16, 2014, Adelaide, Australia. Details: Society of Petroleum Engineers, Suite B-11-11, Level 11, Block B, Plaza Mont Kiara, Jalan Bukit Kiara, Mont Kiara, 50480 Kuala Lumpur, Malaysia. Tel: +60 36201 2330; fax: +60 36201 3220; e-mail: spekl@spe.org; website: www.spe.org/events/apogce/2014.

**Russian oil and gas exploration and production technical conference and exhibition**, October 14–16, 2014, Moscow, Russia. Details: Society of Petroleum Engineers, Part Third Floor East, Portland House, 4 Great Portland Street, London W1W 8QJ, UK. Tel: +44 207 299 3300; fax: +44 207 299 3309; e-mail: speloni@spe.org; website: www.russiandoilgas.ru/en/Home.

**2nd Topco LNG tanker/shipping assembly**, October 15–16, 2014, Shanghai, PR of China. Details: The Oriental Pro-Energy Consulting Organization (TOPCO), R2502, No 201b, Zhujiang Dijing, No 28, Guangqu Rd, Chaoyang Dist, Beijing, PR of China. Tel: +86 10 58 63 43 46; fax: +86 10 58 63 22 91; e-mail: topco@topcoevents.com; website: www.chinalingshipping.com

**3rd Offshore support vessel world forum**, October 15–16, 2014, Shanghai, PR of China. Details: The Oriental Pro-Energy Consulting Organization (TOPCO), R2502, No 201b, Zhujiang Dijing, No 28, Guangqu Rd, Chaoyang Dist, Beijing, PR of China. Tel: +86 10 58 63 43 46; fax: +86 10 58 63 22 91; e-mail: topco@topcoevents.com; website: www.osworld.org

**3rd East Africa oil and gas summit**, October 15–17, 2014, Nairobi, Kenya. Details: Global Event Partners, London Office, 20–22 Bedford Row, WC1R 4JS, London, UK. Tel: +44 20 72 02 75 00; fax: +44 20 72 02 76 00; e-mail: enquire@wtgevents.com; website: www.topcoevents.com

**9th Global LNG tech summit 2014**, October 15–17, 2014, Barcelona, Spain. Details: World Trade Group Corporate, 90 Union Street, London SE1 ONW, UK. Tel: +44 20 72 02 75 00; fax: +44 20 72 02 76 00; e-mail: enquiry@wtgevents.com; website: www.lngsummit.com

**24th Annual Asia crude oil summit**, October 16–17, 2014, Singapore. Details: Platts, 20 Canada Square, Canary Wharf, London E14 5LH, UK. Tel: +44 207 1766142; fax: +44 207 176 8512; e-mail: cynthia.rugg@platts.com; website: http://events.platts.com/asiaoilsummit/home

**7th Annual Appalachian oil and gas**, October 16–17, 2014, Pittsburgh, USA. Details: Platts, 20 Canada Square, Canary Wharf, London E14 5LH, UK. Tel: +44 207 1766142; fax: +44 207 176 8512; e-mail: cynthia.rugg@platts.com; website: www.platts.com/conference detail/2014/pca433/index

**Somalia oil and gas 2014**, October 20, 2014, London, UK. Details: CWC Associates Ltd, Regent House, Oyster Wharf, 16–18 Lombard Road, London SW11 3RF, UK. Tel: +44 207 978 0000; fax: +44 207 978 0099; e-mail: sshelton@thecwcgroup.com; website: www.somalia-oil-gas.com

**3rd Global innovative EOR techniques conference**, October 20–21, 2014, Dubai, UAE. Details: Fleming Gulf Conferences, Dubai Airport Free Zone, PO Box 54772, Dubai, UAE. Tel: +971 4 60 91 555; fax: +971 4 60 91 589; e-mail: info@fleminggulf.com; website: http://energy.fleminggulf.com/eor-techniques-conference

**Offshore drilling forum**, October 20–21, 2014, Stavanger, Norway. Details: IBC Global Conferences, The Bookings Department, Informa UK Ltd, PO Box 406, West Byllet, KT14 6W, UK. Tel: +44 20 7017 55 18; fax: +44 20 7017 47 15; e-mail: energycustserv@informa.com; website: www.ibcenergy.com/event/Offshore-Drilling-Rigs-Conference.

**The Mexico oil and gas summit**, October 20–21, 2014, Mexico City, Mexico. Details: 3rd Floor, Archway House, 1–3 Worship Street, London EC2A 2AB, UK. Tel: +44 20 7127 45 01; fax: +44 20 7127 45 03; e-mail: info@oliverkinross.com; website: www.mexicoenergy2014.com

**5th annual fire safe Middle East**, October 20–22, 2014, Dubai, UAE. Details: Fleming Gulf Conferences, Dubai Airport Free Zone, PO Box 54772, Dubai, UAE. Tel: +971 4 60 91 555; fax: +971 4 60 91 589; e-mail: info@fleminggulf.com; website: http://hse.fleminggulf.com/middle-east-firesafe-conference

**Small-mid scale LNG North America 2014**, October 20–22, 2014, Houston, USA. Details: IQPC Ltd, Anchor House, 15–19 Britten Street, London SW3 3QL, UK. Tel: +44 207 368 9300; fax: +44 207 368 9301; e-mail: enquire@iqpc.co.uk; website: www.lngnorthamerica.com

**Financing oil and gas**, October 20–23, 2014, Geneva, Switzerland. Details: International Business House, Tatyana Naiden, Balfour House, 741 High Road, London N12 0BP, UK. Tel: +44 207 183 45 07; fax: +44 207 504 82 25; e-mail: tatyana.naiden@ibhouse.net; website: www.ibhouse.net

**2nd Global gas opportunities summit**, October 21–22, 2014, Istanbul, Turkey. Details: Fleming Gulf Conferences, Dubai Airport Free Zone, PO Box 54772, Dubai, UAE. Tel: +971 4 60 91 555; fax: +971 4 60 91 589; e-mail: info@fleminggulf.com; website: http://energy.fleminggulf.com/global-gas-opportunities-summit

**Lebanon international petroleum exhibition and conference**, October 21–22, 2014, Beirut, Lebanon. Details: European Association of Geoscientists & Engineers (EAGE) Middle East FZ LLC, Dubai Knowledge Village, PO Box 501711, Dubai, UAE. Tel: +971 4 369 38 97, fax: +971 4 360 47 02; e-mail: middle.east@eage.org; website: www.eage.org

**The MENA mining show 2014**, October 21–22, 2014, Dubai, UAE. Details: Terrapinn Holdings Ltd, First Floor, Modular Place, Turnberry Office Park, 48 Grosvenor Road, Bryanston 2021, South Africa. Tel: +27 11 516 4000; fax: +27 11 483 6000; e-mail: enquiry.za@terrapinn.com; website: www.terrapinn.com/exhibition/miningshow/index.htm

**12th Annual FLNG Asia Pacific summit**, October 21–23, 2014, Seoul, South Korea. Details: IQPC Ltd, Anchor House, 15–19 Britten Street, London SW3 3QL, UK. Tel: +44 207 368 9300; fax: +44 207 368 9301; e-mail: enquire@iqpc.co.uk; website: www.flngkorea.com

**1st National forum Gabon oil and gas**, October 22–23, 2014, Angondjé, Gabon. Details: The Exchange Ltd, 5th Floor, 86 Hatton Garden, London EC1N 8Q, UK. Tel: +44 207 067 1800; fax: +44 207 242 2673; e-mail: enquiry.za@terrapinn.com; website: www.theenergyexchange.co.uk/event/1st-national-forum-gabon-oil-gas.
The changing face of crude oil price spreads

Crude oil futures prices on the two sides of the Atlantic Basin have performed differently since the start of this year.

According to the OPEC Secretariat, while the price of the United States benchmark crude, WTI, had surged by around $5.2/barrel on the New York Mercantile Exchange (NYMEX) during the first seven months of the year, compared to the same period a year earlier, North Sea marker crude Brent gained only 91¢ on the Intercontinental Exchange (ICE) during the same period, narrowing the spread between the two.

OPEC’s Monthly Oil Market Report (MOMR) for August observed that the Brent-WTI spread reduced significantly during the first half of the year, due to bullish US market fundamentals supporting WTI.

“This was in addition to ongoing massive volumes of crude being redirected to the US Gulf Coast (USGC) from the midcontinent via newly constructed/reversed pipelines,” the publication’s feature article said.

Simultaneously, it continued, the Brent market remained under pressure amid ample crude supplies and lackluster European buying, due to weak global demand for middle distillates.

The MOMR pointed out that the overheated US market was triggered by strong gasoline demand, allowing gasoline prices to increase by more than $5/b during the second quarter of the year.

As a result, refinery margins for WTI crude on the USGC showed a sharp increase, thus encouraging refineries to ramp up run rates.

The report noted that US refinery throughputs struck their highest level since 1990 at 16.6 million b/d.

“Running refineries flat out led to several significant draws of even up to 7.5m b in crude stocks in some weeks and helped bring Cushing levels down to a fresh five-and-a-half-year low.”

The MOMR stated that the high seasonal run rates amid robust USGC refining margins and diminishing stocks had underpinned the strength of WTI, thereby narrowing the Brent-WTI spread.

Firm seasonal refinery demand had also resulted in a stronger sweet crude market on the USGC, pushing prices near their highest levels of the year.

LLS, the benchmark for USGC sweet crudes, it said, had recently risen to a premium of close to $2.50/b to Dated Brent, compared to the minus $4/b averaged over the first half of the year.

“Therefore, Dated Brent price-related sweet crudes looked more attractive to US refiners on a prompt basis, particularly West African grades.”

The MOMR said the Brent market and all Brent price-related sweet crude values had been undermined by low European and Asian demand caused by poor refining margins, narrow product crack spreads and ongoing steady supplies, despite serious geopolitical tension in several regions, which had spread rapidly to all West African and other sweet crudes available at the Mediterranean.

“The West African crude premiums/differentials have deteriorated, with some near multi-year lows.”

The publication said North Sea light sweet crude values saw the same trend on the partial return and prospect of higher supplies of Libyan crudes to the market after being disrupted for almost a year.

Meanwhile, it said, Brent’s premium to Dubai fell to its lowest level in eight months as the Brent price softened. By mid-July, Brent-Dubai was valued at $3.10/b, the narrowest level since November 8.

The drop had helped narrowing the gap to Dubai after it hit a nine-month high of $4.96/b on June 13.

“A narrower spread makes Brent-linked grades more attractive than those priced to Dubai and encourages the flow of Brent-linked crude, particularly West African grades, from the eastern Atlantic Basin to Asia.

Looking forward, said the MOMR, reaching the end of the driving season together with upcoming refinery maintenance, demand for crude was expected to ease, which should impact refinery margins in the US.

“In the meantime, increased availability of crude in Europe and Asia could support regional refinery margins in the second half of the year,” it concluded.
The OPEC Reference Basket fell by $2.28 to $105.61/barrel in July amid easing worries about supply disruptions and weaker-than-expected refinery crude demand in Asia and Europe. Speculators also sharply reduced net long positions. Nymex WTI in July lost $2.75 to stand at $102.39/b and ICE Brent slipped $3.78 to $108.19/b. The Brent/WTI spread narrowed further by almost $1.00 to stand at $5.80/b, comparable to September 2013 levels.

World economic growth for 2014 and 2015 remains unchanged at 3.1 per cent and 3.4 per cent, respectively. The better-than-expected first half GDP numbers in the United States led to an upward revision to this year’s US GDP growth forecast to 2.0 per cent from 1.6 per cent.

This also lifted the OECD forecast for 2014 to 1.8 per cent from 1.7 per cent, while the 2015 OECD growth forecast remains at 2.0 per cent. The positive developments in the OECD region have been counterbalanced by downward revisions mainly for Latin American economies, while the growth forecasts for China and India remain unchanged.

The forecast for world oil demand growth in 2014 has been revised down slightly to 1.10 million b/d, following the lower-than-expected performance of the OECD in the second quarter. For 2015, demand growth is expected to be around 1.21m b/d, in line with the previous report.

Non-OPEC oil supply growth is forecast to increase by 1.50m b/d in 2014, representing a minor upward revision from the previous report as most second quarter data has become available. Non-OPEC oil supply growth in 2015 has been revised lower to 1.27m b/d.

Output of OPEC NGLs and non-conventional liquids is expected to grow by 200,000 b/d to average 6.01m b/d in 2015. In July 2014, OPEC crude oil production increased by around 167,000 b/d to average 29.91m b/d, according to secondary sources.

The dirty tanker market experienced a general rising trend across all classes on the back of increased activities, port delays, and prompt replacements.

Clean tanker spot freight rates declined compared to the previous month as market activities remained limited in both east and west of Suez versus the supply of tonnage.

OECD commercial oil stocks fell in June to stand 81m b below the five-year average. Crude stocks showed a slight surplus of around 2m b, while products indicated a deficit of 83m b.

In terms of forward cover, OECD commercial stocks stood at 57.2 days. Preliminary data for July shows that US total commercial oil stocks rose by around 2.1m b, which is 3.0m b above the latest five-year average. US crude commercial stocks represent a surplus of 8.6m b, while product stocks indicated a deficit of 5.6m b.

Demand for OPEC crude in 2014 was revised down by 100,000 b/d from the previous report to stand at 29.6m b/d. In 2015, the forecast for required OPEC crude remains unchanged at 29.4m b/d.
Global economic recovery gaining some traction after early stutter

September 2014

After a relatively weak start to the year, the global economy has gained traction again. That is the view of analysts and experts at the OPEC Secretariat in Vienna.

However, the Organization’s Monthly Oil Market Report (MOMR) for September warned that the global economic growth trend remained “slow and uneven”.

It observed that the United States had performed better after a considerable decline in the first quarter, while Japan was facing headwinds after its sales tax-increase in April.

In addition, the Euro-zone remained “entangled in multiple concerns”, while growth in the emerging economies had continued to decelerate.

This trend, commented a feature article in the publication, had also become visible in the most recent numbers for global industrial production.

World GDP growth expectations, therefore, remained at a relatively modest level of 3.1 per cent in 2014 and were expected to accelerate to 3.4 per cent in 2015, based on 2005 purchasing power parity (ppp) weights.

The OECD group of economies was forecast to grow by 1.8 per cent this year and by 2.0 per cent in 2015.

The report noted that after rebounding from a decline in the first quarter, the US was forecast to grow by 2.1 per cent in 2014. “For next year, slowing monetary stimulus in combination with small productivity gains and the possible re-emergence of a previous governmental gridlock implies a limited upside, when growth is forecast to reach 2.6 per cent,” it said.

The MOMR stated that Japan was currently facing a larger-than-anticipated negative impact from its April sales tax increase and a challenging environment for its exports. As a result, Japanese growth was forecast at only 0.9 per cent in 2014.

“Given that the soft recovery might continue and along with the prospect of another sales tax increase in 2015, GDP growth in Japan is expected to reach 1.2 per cent next year.”

Also in the Euro-zone, said the MOMR, improvements remained halting with growth forecast at just 0.8 per cent this year.

“Given challenges from the slow improvement in labour markets, the risk of deflation and the recapitalization needs of the banking sector, growth in 2015 is forecast to be only slightly higher at 1.1 per cent,” it maintained.

The MOMR said that in the developing and emerging economies, the sluggish pace of growth had continued into the current year.

Except for India, the other major emerging economies were expected to grow at a lower rate in 2014, compared to last year.

Recovering from low growth last year, India was expected to grow at 5.5 per cent in 2014 and at 5.8 per cent in 2015.

Russia and Brazil were expected to experience only limited growth this year, before slightly improving in 2015.

The MOMR said that coming from very high growth levels last year, China was forecast to grow by 7.4 per cent in 2014 and 7.2 per cent in 2015, as the economy continued maturing, while the country was in the process of managing the imbalances in the economy.

Although only modest growth has been observed so far this year, much of this has already been taken into account in earlier estimates for the remainder of this year and for 2015,” the report explained.

At the same time, it stressed, ongoing geopolitical issues could further impact growth negatively.

“A continued tapering or even ending of extraordinary monetary supply measures in the US, in combination with rising interest rates, could cause additional capital outflows from emerging economies to safer and/or higher yielding markets.”

The MOMR said that combined with continued sluggish growth in the global economy, this capital outflow would not support world oil demand growth at a time when overall crude inventories were at a comfortable level.

“Any economic improvement due a resolution of ongoing geopolitical concerns will boost already troubled economies and improve consumer sentiment, leading to higher oil demand growth in the near future,” the feature article concluded.
The OPEC Reference Basket fell by $4.86 in August to stand at $100.75/b. Nymex WTI declined by $6.32 to $96.08/b and ICE Brent dropped by $4.79 to $103.40/b. Speculators sharply cut net long positions amid ample supply and low demand. The Brent-WTI spread widened to around $7.30/b as stock draws at Cushing, Oklahoma, have finally stalled.

World economic growth for 2014 and 2015 remains unchanged at 3.1 per cent and 3.4 per cent, respectively. A better-than-expected US GDP in the second quarter was offset by ongoing challenges in the Euro-zone and a large decline in second-quarter GDP growth in Japan. This kept the OECD GDP growth forecast at 1.8 per cent in 2014 and 2.0 per cent in 2015.

Expectations for China and India remain unchanged, with China growing at 7.4 per cent and 7.2 per cent, and India at 5.5 per cent and 5.8 per cent, respectively. Brazil’s growth has been revised down to 0.7 per cent in 2014 and 1.4 per cent in 2015, while Russia’s GDP growth forecast has also been lowered to 0.3 per cent in 2014 and 1.1 per cent in 2015.

World oil demand growth in 2014 is expected to reach 1.05m b/d, following a downward revision of around 50,000 b/d, mainly due to the weaker-than-expected performance of the OECD region. In 2015, world oil demand is forecast to increase by 1.19m b/d, representing a marginal downward adjustment, as an upward revision in the non-OECD region was offset by slower OECD growth.

Non-OPEC oil supply growth is expected to increase by 1.68m b/d in 2014, following an upward revision of 180,000 b/d from the previous month. In 2015, non-OPEC oil supply is projected to grow by 1.24m b/d, representing a downward adjustment of 30,000 b/d from the previous forecast.

Output of OPEC NGLs and non-conventional liquids is forecast to grow by 200,000 b/d in 2015 to average 6.03m b/d. In August, OPEC crude oil production, according to secondary sources, increased by 1.93m b/d to average 30.35m b/d.

Product markets in the Atlantic Basin saw support from strong US gasoline demand amid a tightening sentiment, due to falling inventories. Steady middle distillate demand and lower inflows into the region prevented European margins from dropping, while US margins were boosted by falling WTI prices. In Asia, the weaker light distillates market caused refinery margins to continue weakening.

A general weak sentiment was seen in the dirty tanker market in August on the back of low tonnage demand and reduced activities. Clean tanker freight rates improved East of Suez, but encountered a slight decline in the West. OPEC and Middle East sailings declined compared to the previous month, although arrivals in all regions were higher, except in the Far East.

OECD commercial oil inventories rose in July, but remained 37m b below the five-year average. Crude stocks showed a surplus of around 22m b, while products registered a deficit of 59m b. In terms of forward cover, OECD commercial stocks stood at 58.2 days in July.

Preliminary data for August shows that US total commercial oil stocks rose by around 3.7m b, which is around 10.0m b above the five-year average. Crude and product stocks showed surpluses of 7.0m b and 3.0m b, respectively.

Demand for OPEC crude in 2014 was revised down by 200,000 b/d from the previous month to stand at 29.5m b/d. In 2015, required OPEC crude was also revised down by 200,000 b/d to stand at 29.2m b/d.
Sources: The netback values for TJL price calculations are taken from RVM; Platt’s; Secretariat’s assessments.

1. Indonesia suspended its OPEC Membership on December 31, 2008.

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 Girassol of January 2009, the ORB excludes Minas (Indonesia).

Table 1: OPEC Reference Basket crude oil prices

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Table 2: Selected OPEC and non-OPEC spot crude oil prices

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<td>93.83</td>
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<td>110.92</td>
<td>108.28</td>
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<td>110.44</td>
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<td>WTI – North America</td>
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<td>106.26</td>
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<td>93.76</td>
<td>97.72</td>
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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 (or 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; Ural s/cf Mediterranean. All others fob loading port.

Sources: The netback values for TJL price calculations are taken from RVM, Platt’s, Secretariat’s assessments.
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 Meray as of January 2009. The ORB has been revised as of this date.
### Table and Graph 3: North European market — spot barges, fob Rotterdam

<table>
<thead>
<tr>
<th></th>
<th>naphtha</th>
<th>regular gasoline 87</th>
<th>diesel ultra light</th>
<th>jet kero</th>
<th>fuel oil 1% per cent S</th>
<th>fuel oil 3.5% per cent S</th>
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<tr>
<td>August</td>
<td>101.10</td>
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<td>92.58</td>
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<td>124.93</td>
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<td>90.63</td>
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<td>120.87</td>
<td>125.54</td>
<td>128.43</td>
<td>94.96</td>
<td>91.72</td>
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| **2014** |         |                     |                   |         |                        |                        |
| January  | 101.62  | 116.51              | 121.84            | 124.57  | 92.37                  | 89.22                  |
| February | 101.07  | 119.89              | 123.29            | 124.63  | 97.55                  | 91.72                  |
| March    | 100.82  | 120.86              | 121.01            | 121.71  | 100.10                 | 91.27                  |
| April    | 102.40  | 128.03              | 122.13            | 122.24  | 98.07                  | 91.32                  |
| May      | 103.76  | 127.36              | 121.29            | 123.29  | 98.66                  | 91.19                  |
| June     | 105.38  | 130.41              | 121.59            | 124.73  | 98.71                  | 93.20                  |
| July     | 103.50  | 128.08              | 119.20            | 122.77  | 93.75                  | 90.81                  |
| August   | 95.76   | 119.86              | 116.65            | 120.02  | 88.64                  | 89.16                  |

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

<table>
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<tr>
<th></th>
<th>naphtha</th>
<th>premium gasoline 50ppm</th>
<th>diesel ultra light</th>
<th>jet kero</th>
<th>fuel oil 1% per cent S</th>
<th>fuel oil 3.5% per cent S</th>
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<td>90.93</td>
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</tr>
</tbody>
</table>

| **2014** |         |                        |                   |         |                        |                        |
| January  | 98.76   | 113.28                 | 123.07            | 92.94   | 90.16                  |                        |
| February | 98.45   | 116.41                 | 124.05            | 98.88   | 91.58                  |                        |
| March    | 97.86   | 115.23                 | 121.46            | 100.69  | 90.68                  |                        |
| April    | 100.23  | 122.87                 | 122.04            | 98.72   | 90.17                  |                        |
| May      | 101.83  | 121.92                 | 122.22            | 99.73   | 91.55                  |                        |
| June     | 103.30  | 126.37                 | 122.79            | 100.17  | 92.20                  |                        |
| July     | 101.50  | 122.91                 | 119.77            | 94.49   | 91.00                  |                        |
| August   | 93.81   | 115.19                 | 117.07            | 89.68   | 88.87                  |                        |

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

<table>
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<tr>
<th></th>
<th>regular gasoline unleaded 87</th>
<th>gasoil</th>
<th>jet kero</th>
<th>fuel oil 0.3% per cent S</th>
<th>fuel oil 2.2% per cent S</th>
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<tr>
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<td>123.37</td>
<td>123.47</td>
<td>127.33</td>
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<td>123.67</td>
<td>125.27</td>
<td>107.03</td>
<td>95.06</td>
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<td>123.00</td>
<td>123.13</td>
<td>111.27</td>
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<td>126.72</td>
<td>128.73</td>
<td>121.67</td>
<td>93.38</td>
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</table>

| **2014** |                               |        |         |                          |                          |
| January  | 112.20                        | 127.16 | 128.58  | 126.38                   | 91.97                    |
| February | 117.66                        | 127.80 | 129.67  | 129.77                   | 96.51                    |
| March    | 115.94                        | 121.77 | 124.16  | 118.41                   | 94.11                    |
| April    | 122.60                        | 120.79 | 122.17  | 112.75                   | 92.74                    |
| May      | 120.49                        | 119.69 | 121.43  | 107.82                   | 93.37                    |
| June     | 121.86                        | 120.46 | 122.17  | 106.62                   | 95.50                    |
| July     | 118.21                        | 116.19 | 120.48  | 109.23                   | 92.39                    |
| August   | 114.09                        | 115.18 | 123.25  | 102.58                   | 88.74                    |

**Source:** Platts. Prices are average of available days.
Table and Graph 6: Caribbean market — spot cargoes, fob

<table>
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<tr>
<th></th>
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<td>86.94</td>
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Table and Graph 7: Singapore market — spot cargoes, fob

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<td>123.57</td>
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<td>96.32</td>
<td>93.88</td>
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<td>97.02</td>
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Table and Graph 8: Middle East Gulf market — spot cargoes, fob

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Source: Platts. Prices are average of available days.
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