



A review of International Petroleum Week 2019

Geopolitics | Sustainability | Technology



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DIARY DATE
IP Week 2020
25–27 February 2020

INTRODUCTION

Welcome to the International Petroleum (IP) Week 2019 review, which highlights the key issues, messages and takeaways from IP Week 2019. This year's conference was held on 26–28 February, and addressed the theme 'Defining the future for the oil and gas industry'.

Delegates heard from an impressive international line-up of some of the most senior and dynamic energy sector leaders, with presentations covering an extensive range of topics both up-, mid- and downstream.

Attendees also had the chance to ask questions from the floor during a series of panel sessions, and had extensive networking opportunities during coffee breaks and lunches at the Hilton InterContinental Park Lane Hotel in London, which also housed the IP Week exhibition.

We hope you find the content of this supplement interesting and informative, and would encourage you to attend IP Week 2020, which will take place on 25–27 February 2020. A platform for thought leadership on the biggest issues affecting the global oil and gas sector, you really can't afford to miss.

Kim Jackson, Editor



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Staying ahead of the curve

International Petroleum Week 2019 focused on three key areas that continue to shape the international energy sector – geopolitics, sustainability and technology.

As a global industry shaped in part by geopolitics, the three-day programme shone a spotlight on key oil and gas regions, including the Middle East, Africa, Russia and the Caspian, highlighting how the energy sector is navigating the ever-evolving political landscape.

The industry's collective response to decarbonise the global energy system was also discussed at length, in particular the oil and gas sector's role in tackling climate change. The message was clear – incremental change is no longer an answer, the industry must adapt fast, while better communicating with all stakeholders as the sector transitions to a low carbon future.

What's more, staying ahead of the curve technologically, strategically and sustainably, is an industry imperative. This year's programme placed a big focus on how digitalisation, data management and analytics are driving change and optimising operations up and down the value chain.

Sustainable solutions

Sustainability was a key focus of this year's IP Week programme. 'We put sustainability at the heart of IP Week 2019 so there would be no dodging the issues of carbon, methane or climate change,' says Louise Kingham OBE FEI, CEO, Energy Institute (EI). 'The main players in oil and gas are now very open to scrutiny on these issues, and we were keen to convene an event which put the industry's efforts to move further and faster in the spotlight.'

'As a global partner to the energy industry, the EI is working to equip professionals for the big changes ahead. As a result, the Institute has formally become a supporter of the *Methane Guiding Principles* and will use every opportunity to raise awareness of

the need to bear down on this potent greenhouse gas.'

Emissions of methane during oil and gas production are a serious contributor to climate change. It is 28–36 times more potent as a greenhouse gas than carbon dioxide (CO₂) over 100 years.

'While oil and gas are among the causes of the climate change challenge, I'm encouraged that this industry – and the amazing scientists, engineers and innovators within it – can be central to the transformational solutions needed,' said Kingham.

The industry's need to be seen as part of the solution, and not just part of the problem, was an issue picked up by many of the senior figures attending IP Week, including keynote speakers Bob Dudley FEI, CEO, BP and Amin Nasser, President and CEO, Saudi Aramco. Nasser stressed that better communication with *all* stakeholders will be paramount in getting the message across that the oil and gas industry has an important role to play in the low carbon transition. He said: 'Important stakeholders believe that the entire world will soon run on anything but oil. These views are not based on logic and facts, and are formed mostly in response to pressure and hype... Our industry faces a crisis of perception with multiple stakeholders, which puts our ability to supply ample, reliable and affordable energy to billions around the world at risk, which in turn risks their energy security.'

Noting that passenger vehicles made up just 20% of oil demand, while the rest comes from other sectors such as aeroplanes, ships, trucks and petrochemicals, for which there is yet no alternative to oil to meet an expected increase in demand, Nasser called for more investment in the oil and gas sector to meet future growth. 'We should remind stakeholders that oil and gas is responsible for much of today's economic growth, and indeed future growth,' he added.

BP's Bob Dudley echoed Nasser's comments. 'The world is driven by myths and not facts,' he said. 'I

think we have a particular challenge with [the perception of] energy. I think business in general has a huge communications issue. I think we are seeing the effects of the financial crisis rolling through now, particularly in the western world, and everybody is looking for people to blame. Unfortunately I think the political system is starting to blame companies and business more.'

Meanwhile, keynote speaker on day two of IP Week 2019, Liam Fox MP, UK Secretary for International Trade, rejected the 'myth' that Brexit will lead to lower environmental standards in the UK, including its carbon reduction targets. He also asserted continued support for oil and gas, saying: 'The simple fact is that for the moment we do require fossil fuels to deliver secure and affordable energy.'

Parallel breakout sessions

This year's IP Week programme also included a number of well-attended breakout sessions, including a look at how and where the downstream industry's landscape might change in the future; how the marine fuels supply chain is responding to the IMO 2020 bunker fuel specification changes; the coming revolution in digital learning within the petroleum industry; and a discussion on gender diversity in the oil and gas sector.

Food for thought

'IP Week 2019 was a clear success, with over 1,500 international attendees, high quality speakers and great sponsors,' concludes Raphael Vermeir CBE FEI, Chair, IP Week 2019 Programme Board. 'We received positive feedback from delegates regarding the wide range of topical issues discussed and debated, as well as the valuable networking opportunities the event offered. A huge thanks to all that participated.'

The following pages provide an insight to what was discussed during IP Week 2019, providing food for thought and whetting your appetite for IP Week 2020. ●

(Left to right) Malcolm Brinded CBE FEI, President, Energy Institute; Amin Nasser, President and CEO, Saudi Aramco; and Bob Dudley FEI, Group Chief Executive, BP, discussed the dual challenge of delivering more energy, more competitively and sustainably as the global oil and gas sector transitions to a low carbon future, on the opening day of IP Week 2019

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'We put sustainability at the heart of IP Week 2019 so there would be no dodging the issues of carbon, methane or climate change.'

**Louise Kingham
OBE FEI, CEO,
Energy Institute**

A transcript of Amin Nasser's keynote presentation can be found at <https://bit.ly/2NuXlwx>, Bob Dudley's at <https://on.bp.com/21WWMNv> and Liam Fox's at <https://bit.ly/2C9xequ>

A balancing act



For this year's IP Week Dinner, the EI convened a fascinating and frank dialogue between two leading figures from the oil and gas and climate science communities. They found common ground on the need for pace and collaboration to meet the needs of the developing world and the changing climate, writes Jennifer Johnson.



The oil and gas industry is destined to negotiate a difficult balance: How can it provide energy access to the more than one billion people still lacking electricity worldwide while playing its part in achieving the goals of the Paris Agreement?

At this year's IP Week Dinner – held at the Hilton on Park Lane, London – speakers emphasised that expanding energy access and decarbonisation aren't opposing aims. However, doing both will require an unprecedented level of collaboration between government and industry.

EI President Malcolm Brinded CBE FEI started the evening's proceedings by highlighting the challenges, and opportunities, presented by the energy transition.

'When we talk about a clean growth strategy, there's a need for rapid testing, evolution and scale-up of new technologies and business models which can deliver low-carbon solutions affordably to the upwardly-mobile billions,' he said.

The event's Guest of Honour and speaker, Chad Holliday, Chair

of Royal Dutch Shell, used his time on the stage to acknowledge the inevitability of the energy transition. He began by recognising that humanity has navigated energy transitions in the past. In the 1800s, people heated their homes using wood and biomass, with coal rising to prominence in the early part of the following century.

'I predict that the energy transition of today will occur just like the others have, because there's a better system to go to,' Holliday explained. 'It's lower cost, it's more convenient, it's higher quality, it does things we couldn't do before.'

The challenge ahead of the oil and gas industry, Holliday stated, is to figure out how it can pick up the critical pace required to align with global emissions targets. He cited a recent report by the Global Commission on the Economy and Climate, which found that climate action could deliver at least \$26tn in global economic benefits to 2030.

'If we look at a number like \$26tn and say, "well that's enough, let's go back to business as usual", we just won't accomplish what we need to,' Holliday warned.

The Dinner's second guest speaker, Jim Skea CBE, Professor of Sustainable Energy, Imperial College London and Co-Chair, Intergovernmental Panel on Climate Change (IPCC) Working Group III, challenged the oil and gas industry's insular attitude in his presentation.

To set the world on a course to 1.5°C or 2°C warming, Skea said the world needs: 'Rapid, far-reaching and unprecedented – and I would emphasise the unprecedented – changes in all systems if we're going to approach that level of ambition.'

'We know the oil and gas industry is doing lots of things, but

it has got to tell the rest of the world that it's doing these things. This is the important message that the industry needs to get out – it can be part of the solution as well as part of the problem.'

The evening concluded with a Q&A session led by Brinded, with questions posed to Holliday and Skea. The trio explored the role that corporations and governments must play in keeping the planet below 2°C warming.

'The gap between aspiration and action on the ground is the biggest problem at the moment because, frankly, we're not seeing the effort from any government around the world,' Skea explained.

Holliday echoed a similar sentiment – and urged the public and private sectors to open up channels of communication.

'I think what's most important now is that we get the action going,' he said. 'Cooperation between governments and industry is not where it needs to be yet. And I don't think we'll get the acceleration until we improve it.'

Towards the end of the session, Brinded addressed the lingering question of geopolitics – asking Holliday whether he thought the Trump Administration's indifference to climate change would impact emissions. Holliday said the decisions the President had made would 'not change the trajectory at all'.

Finally, the panel acknowledged that the US and Europe might not be the key players in the energy transition at all. When Brinded asked about the importance of China, Holliday conceded: 'If you're not focused on China, you're missing the point.' ●

Chad Holliday, Chair, Royal Dutch Shell (top); Jim Skea CBE FEI, Professor of Sustainable Energy, Imperial College London and Co-Chair, Intergovernmental Panel on Climate Change (IPCC) Working Group III (centre), and EI President Malcolm Brinded CBE FEI (below)



All change for Big Oil

Faced with tight oil prices and a fundamental rethink of the role of oil in the economy and wider energy ecosystem, three critical trends have to be addressed, explains Paul Bogenrieder, Senior Energy Industry Analyst, EY.

Two themes, one near term and one longer term, have dominated the oil industry strategy landscape for the past five years.

The first is structurally lower oil prices. Until late 2014, everyone's outlook had oil prices at or near \$100/b for as far as the eye could see. In retrospect, that wasn't sustainable. There was more oil, recoverable at lower cost than anyone could envision at those prices.

The second is a fundamental rethinking of the role of oil in the economy and the energy ecosystem. The confluence of government pressure to decarbonise and advances in battery, electric vehicle (EV) and renewable energy technologies have sparked talk of 'peak oil demand' and an industry in decline.

From those themes, we have identified three critical trends. First, international oil companies (IOCs) are exploring their options to expand into non-oil businesses. They are not betting the core business, but they are putting capital into ventures that could blossom as the energy picture clarifies.

Second, national oil companies (NOCs), mindful of the revenue requirements of their owner-governments, are rethinking their business strategies and practices. What worked at \$100 oil doesn't work at \$60 or \$70 oil.

Third, and potentially most impactful, is the emergence of digital technologies in the oil field. More granular data gathering, more sophisticated data analysis and more precise process control could bring another step-change in cost structures all along the oil and gas value chain.

Let's look at each of them individually.

IOC portfolios-building optionality

Everything that Big Oil has done – everything that it knows and

every perception that the public has of it – is at risk. Its experience, competencies and brand are focused on a business that many are forecasting to be in decline. The obvious solution – use your capital, expertise and brand to transform into the energy company of the future.

If the future of renewable or even low carbon energy were certain and the execution of an implementation strategy was without risk, every oil company would have one. But the future of renewable and low carbon energy isn't certain and execution is not without risk. In fact, returns currently generated from alternative energy assets are well below what oil companies earn from their core business.

An obvious avenue is electricity. Electricity is expected to emerge as the energy delivery vehicle of choice. Oil companies have ventured into the power sector before, but those investments were focused on creating markets for natural gas and creating 'optionality' for gas marketing and trading operations. Renewables have had a small place in the portfolios of the majors for many years, but investment in these businesses has ebbed and flowed and has never become material or profitable.

If we look at it objectively, the oil companies' biggest, most natural and probably most profitable investment in the power sector is in a business they are already in – natural gas. Maybe evolution is the ticket rather than revolution.

Maybe it is as simple as supplying more gas, or maybe having a lot of gas makes you a logical owner of gas-fired power plants. If you've got a unique perspective on the economics, you can avoid transaction costs by supplying gas to yourself and owning power plants gives you additional optionality when it comes to moving gas around – it

seems like a natural fit.

Once you've put down a footprint on the power grid, you've got a lot of other opportunities. You have experience working with grid operators, host utilities, power marketers and power retailers. Maybe you invest in renewables or go into the power retailing business. When that happens, you are a diversified energy company.

Redefining the NOC strategy – moving from 'volume to value'

For many emerging economies heavily dependent on oil revenue, the reality of structurally lower oil prices has unleashed a chain reaction with far-reaching consequences on government budgets, sovereign investment, economic development incentives, and critically on subsidy support and social welfare programmes. This is increasing the pressure on the NOCs and changing the very nature of the relationship with the state (their key stakeholder).

NOCs are major (some might say dominant) players in the global oil and gas industry, accounting for 58% of global reserves and 56% of production. They often play a leading role in emerging market economies and are normally called upon to be the custodians of a nation's resource development and energy security. The immediate focus is on the expectations faced by the NOC, to sustain and grow in this new oil price environment. We identify this critical expectation on the NOC as the new 'fiscal responsibility' regime, which places a clear emphasis on profitability and quality of earnings.

We have witnessed an unprecedented number of governments considering partial privatisation or listing of their NOCs to raise capital, exploring alternative means of funding capital requirements and project financing. The level of economic diversification, and thus relative contribution of the oil and gas sector to the country's GDP, is pivotal on the urgency of action required.

With oil prices not expected to return to their 2014 peak, NOCs are quickly becoming aware of the need to shift away from a focus on



'We need to help our stakeholders realise that all energy sources will be required for decades to come, and that a long-term investment in our industry is both wise and profitable to deliver on that demand growth.'

**Amin Nasser,
President and CEO,
Saudi Aramco**

volumes towards the realisation of value. In this capital-constrained environment, the focus needs to be on extracting the maximum sustainable value from capital assets or, in other words, doing more with less. While moving from volume to value is not a new concept for IOCs, NOCs have embraced the concept only more recently.

The case for NOC transformation is clear. The coming years will be defining for the NOCs as they progress to become 'commercial NOCs', fully embracing the need to embark on the capital transformation.

Industry transformations are never simple. NOCs must change the way they relate to their governments to maintain their critical roles within the global oil and gas market.

The digital imperative and process compression

The fundamental driver is simple – leveraging the power of digital technology to transform business operations can deliver real, sustained value to the bottom line. Another reason that the time is right for digitalisation in oil and gas is the robust nature of the latest technology. The consumer internet couldn't handle the volume of data oil and gas needs for digital to be meaningful. With the advent of the industrial internet, there is now the infrastructure to handle the vast amounts of data generated along with advanced analytics, cloud storage and increasingly reliable mobile communications.

These recent technological advances enable digital technology to transform the oil and gas industry. According to Oxford Economics, IoE (Internet of Everything) adoption by the oil and gas industry has the potential to

increase global GDP by up to 0.8% – or \$816bn – by 2025.

If there is a place where digital technology offers the greatest impact and highest returns in oil and gas in the short term, it is compressing and standardising disaggregated operational supply chain processes. To do so will create a step change in efficiency, like what has been seen in other manufacturing industries. We call this 'process compression'.

Process compression brings together three foundation digital capabilities, all of which exist in the marketplace today – smart assets, paperless processes and data analytics – all in a secure environment. When applied across the oil and gas supply chain, digital technology can simplify and synchronise processes and accelerate integrated decision-making.

We have identified five areas for process compression:

Topside production optimisation

Topside production can be optimised at a lower cost with improved interconnection between data sources and physical locations to drive better, fact-based decisions.

Predictive maintenance and repair

When decisions on production assets are reactive rather than proactive (ie based on actual, historical failure data), this leads to maintenance overspend, duplicate inventory and suboptimal resource allocation. Today, tracking devices on inventory and asset management applications can connect tool delivery and management to preventive maintenance schedules.

Logistics and warehousing

Checking that equipment and (fleet) resources serving critical

assets are tracked across all parties involved in the network and connected to business processes is critical to production maximisation. Without this capability, deliveries are missed due to route delays, assets are not loaded efficiently, and there is only paper-driven recognition of services.

Integrated planning and execution

Directors, asset managers and rig locations often do not have the same live understanding of production status and plans. When changes are not integrated and communicated consistently, there is no shared consciousness. The legacy operating model is based on a siloed engineering legacy, which is now dealing with the complexity of an interconnected world. Digital toolsets such as process collaboration and analytics can enable cross-functional understanding and collaborative decision-making based on total situational knowledge.

Digital finance transformation

Massive amounts of paper-based manual transactions can result in 7% to 15% overpayment or coding errors. Digital solutions can combine mobile, cloud and interfaces to finance systems to achieve live automation of invoicing in the field. Real-time views of back office activities and expenditures can increase accuracy and timeliness in billing, releasing work capital.

These processes not only drive down operational costs, but also position early adopters for the future.

Looking ahead

The industry is facing a generation of workers who are digital natives. Organisations that harness digital technologies and the drive and energy that they unleash have a chance of achieving true differentiation – not just in terms of increased efficiency, but in the ability to attract and retain the next generation of brainpower.

The future of oil and gas will be what the market makes it. IOC and NOC strategy will evolve and companies will implement new technologies. Successful companies will thrive and grow, others will shrink. The only thing that is certain is change. ●



'The pace of change in digital technologies is blistering; technologies like quantum computing, artificial intelligence and blockchain are going to deliver phenomenal advances in our industry.'

Bob Dudley **FEL,**
CEO, BP



Speaking at the digital technologies session during IP Week 2019, Quintiq's Uri Tenzer explained how Big Data, machine learning, artificial intelligence, optimisation and digitalisation provided operators with increased flexibility, accuracy, agility and granularity, which in turn offered more margin and more sustainable operations, and could bring companies closer to their customers

Let's talk trust



Presentations from (left to right) Michael Moore, Former Scottish Secretary and Special Advisor, PwC; Gordon Ballard, Executive Director, IOGP; Alan McCrae, UK Oil & Gas Leader, PwC; Isabelle Muller, Director General, French Union of Petroleum Industries (UFIP) and Demetris Fessas, Acting General Manager, Cyprus Hydrocarbons Company, mapped out a series of future oil and gas scenarios for Europe as part of the geopolitics session during IP Week 2019

The global energy sector and governments need to connect better with the public, if energy and climate policies are to succeed, writes Maria Kielmas.

We have to connect to the people – this was the advice of Isabelle Muller, Director General of the French Union of Petroleum Industries (UFIP), during the geopolitics session at IP Week 2019. Muller was referring to the continuing protests in France by the *gilets jaunes* ('yellow vests'), an amorphous social protest movement triggered in November 2018 by rising fuel taxes and now demanding, among other things, that President Emmanuel Macron resigns.

France has an ambition to become carbon neutral by mid-century. But the cost of this, she noted, 'are beyond politicians to explain'. The inability of governments to connect with the populations they govern on the real cost of climate debate lies at the core of today's geopolitics. Clear communication will have a decisive impact on the success or failure of any government's energy and climate policies, she explained.

Four decades of crises

The roots of this mistrust lie in the fall-out from eight financial crises since the 1982 Latin American debt crisis and the democratising transitions of former communist and other authoritarian states over the same period. Attempts to reform or overturn Arab

autocracies and monarchies in the so-called Arab Spring after 2011 either failed, with the exception of Tunisia, or resulted in war, as in Syria. The only functioning institutions in Middle Eastern autocracies, the military and security services, were determined to maintain power.

Latin American and Asian countries and their over-leveraged banks were bailed-out by multilateral financial institutions in return for structural reforms. This created economic growth, the rise of middle classes and varied degrees of market economies, but at an immense social cost. Most of the populations saw food and energy costs skyrocket, while the former political and business elites recycled themselves to become beneficiaries of the new systems. Well-connected businesses saw their debts consolidated with sovereign debt for the most part forgiven.

Equally, former communist elites miraculously discovered the virtues of liberal democracy and pluralism, while millions of their populations emigrated in order to make a living. In all of these countries, stolen state funds fuelled the rise of oligarchies, often related to top politicians. Today, these are often the 'local partners' foreign investors are invited to choose for their conventional and

renewable energy projects. Consequently, any taxes and charges are commonly challenged by their local populace.

Home truths for rich nations

None of this pain in the developing world really hit home to the populations of industrialised countries of Western Europe and North America until the 2008 financial crisis, the worst such crisis since the 1930s. Central banks introduced 'quantitative easing', a programme that used to be called 'printing money' but this time consisted of taxpayer-funded assets purchases and low interest rates. This resulted in soaring property prices and rental costs, while cherished social welfare spending was cut. Eurozone growth effectively halted, while today, German as well as Italian banks remain fragile and vulnerable to an impending economic slowdown. A slowdown in Chinese economic growth was also a concern for IP Week delegates. At the Middle East session, 57% of participants voted that their companies had not prepared for slower growth in China.

Climate policies in European member states to reduce carbon emissions evolved over the same period, increasing energy costs. According to the European Commission, average electricity prices rose between 15–25% over the period 2008–2015. Consequently, energy poverty is palpable in some of the most prosperous countries such as Sweden and the UK, which have experienced a huge rise in homelessness and food kitchens. So when the French government increased fuel taxes in November 2018 it was the final straw, causing the *gilets jaunes* eruption. Significantly, only 20% of the planned new taxes were to be used for climate-related projects.

More climate projects

The French government rescinded its controversial fuel tax rises in December 2018, but this is only a deferral. The country's decarbonisation programme foresees a ban on oil and gas production in metropolitan France by 2040, a policy shared by Italy, Spain and other EU states. There will be a ban on internal combustion engine (ICE) passenger vehicles by 2040, with only electric vehicles (EVs) permitted. A further increase in carbon taxes is planned that could be up to €0.40c per litre,



'We have to connect to the people,' said, Isabelle Muller, Director General of the French Union of Petroleum Industries (UFIP), explaining that clear communication will have a decisive impact on the success or failure of any government's energy and climate policies



'Climate change concerns in international financial institutions and by investors in multinational corporations is curtailing investment in fossil fuels.'

Jason Bordoff, Professor of Professional Practice in International Affairs at Colombia University

compared with the November 2018 proposed rise of only €0.06c per litre that caused the first protest riots.

Meanwhile, in Germany, draft climate legislation seeks to introduce emissions reduction targets for major economic sectors such as agriculture, transport and buildings as well as the energy sector. Gordon Ballard, Executive Director of the International Association of Oil and Gas Producers (IOGP), told IP Week 2019 delegates that the European Union's policy of decarbonisation and electrification was 'like a religion'. His organisation spends 47% of its time on advocacy in Brussels, stressing that there are still lots of oil and gas resources left which should be exploited. 'We can still make a difference and make it attractive to invest', he said.

UK unprepared

Alan McCrae, UK Oil and Gas Leader at PwC, said a 'reality check' is needed for decarbonisation and climate change issues in the UK as the country seems to be wholly unprepared for this. 'Will we have a *gilets jaunes* movement? Why is this not up for discussion?' In addition, he asked about the possible consequences of higher UK climate taxes.

Gas was once seen as a part of the climate problem, said McCrae, but today it is part of the solution as a replacement for coal. 'So it is important to promote gas production by making tax regimes governing its production less onerous,' he suggested.

Investor advocacy

Climate change concerns in international financial institutions and by investors in multinational corporations is curtailing investment in fossil fuels, noted Jason Bordoff, Professor

of Professional Practice in International Affairs at Colombia University. 'This is a geopolitical challenge to Europe,' he said. It is also having an impact in Africa. Indeed, speakers at the Africa session noted that international financial institutions now demand that a power generation project has a secured uptake of its power production and a guaranteed receipt of revenues. 'It's a big challenge how you get paid for gas in Africa,' said Fredrik Öhrn, President and CEO, Svenska Petroleum Exploration. Both uptake and payments remain problematical in many sub-Saharan countries, where only 32% of the rural population has access to electricity, according to World Bank figures.

However, Bordoff believes that the oil and gas revival in the US has optimised energy security for US allies, such as Europe, as well as at home. It has already had an impact on Russian gas policy in terms of reduced Russian energy prices, new conditions for buyers and accelerated gas market liberalisation, he said.

Nevertheless, completion of the Russia-Germany Nordstream 2 gas pipeline beneath the Baltic Sea, combined with the Shell-Gazprom Baltic LNG project located in Ust Luga close to the Estonian-Russian border, will make Russia Europe's dominant gas supplier. Opposition to potential Russian dominance is bitterly opposed by the US and several EU member states, and could produce irreparable fractures.

Algerian protests

The potential geopolitical challenges created by Europe's decarbonisation programme were underway on the final day of IP Week as protesters in Algeria demonstrated against ailing President Abdelaziz Bouteflika's

decision to stand for a fifth term in April's presidential elections. The aim here is to maintain what Algerians term as '*Le Pouvoir*', 'the power', a mixture of military and business interests behind a nominal presidency.

Falling gas export revenues from a shrinking European market could exacerbate existing political tensions into serious violence.

Algeria's oil and gas exports have funded energy and food price subsidies for the population as part of a social contract, explained Moustefa Ouki, Senior Research Fellow at the Oxford Institute of Energy Studies (OIES), at the Middle East session. As decarbonisation proceeds, and the European market for North African gas shrinks, producing countries will see a fall in export revenues that will impact on national budgets. 'There will be no funds to finance development,' Ouki said.

Asian engine

The Asian market, however, will continue to be the engine for gas market growth, speakers told the IP Week 2019 geopolitics session. Air pollution from coal burning is the vital issue. This could be ameliorated by gas substitution, explained Pablo Galante Escobar, Head of LNG Vitol. 'We see LNG costs going down and they will be significantly competitive against coal and the costs of pollution,' he said.

According to Guy Lui, Head of UK Campus, Peking University and HSBC Business School, gas comprises only 5% of China's energy consumption while coal accounts for 78–80%. 'The costs of air pollution are 3–6% GDP/y,' said Lui. ●

Malcolm Brinded CBE FEI, President, Energy Institute (far left), moderated a panel session on 'Asia's energy landscape: mapping future gas demand' as part of the geopolitics session, featuring (left to right) Randeep Singh Grewal, Chairman and CEO, G3 Exploration; Philip Oliver, Head of Global LNG, Total; Eric Bensaude, Managing Director, Commercial Operations, Trading and Marketing, Cheniere; Pablo Galante Escobar, Head of LNG, Vitol; Professor Guy Lui, Head of the UK Campus, Peking University and HSBC Business School



The emissions challenge

The sound of drums being banged and whistles blown by climate change protestors outside the London IP Week 2019 venue on Park Lane was perhaps a clear illustration of the wide gulf that still exists between green activists on the one side and the oil and gas industry and some government agencies on the other. A key theme of the conference this year was the issue of climate change and the steps being taken towards decarbonising the energy supply chain. A notable message from speakers, and many delegates for that matter, was the need for better communication of what the industry is doing to tackle this issue, and the need for better dialogue between all stakeholders and the general public.

Addressing 'The new era for energy in a changing world' session, Secretary for International Trade and President of the UK Board of Trade, Dr Liam Fox, gave a firm pledge that no matter the outcome of the UK's exit negotiations with the EU, 'my government won't use Brexit as a means to lower those environmental standards to which we are legally committed'. He confirmed that the UK's remaining coal-fired power stations will close by 2025, and five years later there will be no less than 30 GW of offshore wind available. The minister said he was 'heartened' by the fall in offshore UK wind prices, which at the latest auction had come down to £57/MWh.

Government CCS u-turn

The government's commitment to de-carbonise energy includes carbon capture, usage and storage (CCUS). In a remarkable u-turn last November – just three years after controversially axing plans for a £1bn carbon capture and storage (CCS) demonstration project – the government unveiled new plans to deliver the UK's first major carbon capture project by the mid-2020s. The plan includes fresh commitments to invest £20mn in the Clean Gas Project on Teesside in north-east England. The project will serve as a testing ground for the commercialisation of the technology and support the construction of CCUS technologies at industrial sites across the UK;



The global energy industry faces a daunting greenhouse gas (GHG) emissions challenge, writes Nnamdi Anyadike.

as well as earmarking £315mn for projects that decarbonise industrial sites, including potential CCUS infrastructure.

Across the North Sea, Norway's multinational energy company Equinor has become the first company to be awarded an exploitation permit for carbon dioxide (CO₂) storage on the Norwegian Continental Shelf. The permit, awarded in January 2019, covers an area close to the Troll oil and gas field in the North Sea. The company is currently performing front-end engineering and design (FEED) studies on storage with project partners Shell and Total. The project will take CO₂ captured from three onshore industrial facilities in eastern Norway and transport it by ship to a receiving plant onshore, located on the west coast of Norway.

The CO₂ will be stored permanently up to 2,000 metres below the seabed. It is hoped that the development of CO₂ storage may help kick-start a hydrogen market. Hydrogen can be produced from natural gas and generates CO₂ as a by-product. The partners believe that a functioning CO₂ capture, transportation and storage network would make it easier to develop a full-scale value chain for hydrogen. The three partners are working towards a plan for

development and operations (PDO) that is scheduled for delivery in 2019. An investment decision for the Norwegian full-scale CCS project is expected in 2020/2021.

EU investment

Meanwhile, in February 2019, the European Commission announced an investment programme worth more than €10bn for low-carbon technologies in several sectors to boost their global competitiveness. This follows on from the launch last November of the EU's strategic vision for a climate neutral economy by 2050, called 'A Clean Planet for All'. The EU's Innovation Fund will pool together resources amounting to around €10bn, depending on the carbon price.

At least €450mn allowances from the EU Emissions Trading System (EU ETS) Directive will be sold on the carbon market in the period 2020–2030. Commissioner for Climate Action and Energy, Miguel Arias Cañete has stated: 'The EU has already started the modernisation and transformation towards a climate neutral economy... Going climate neutral is necessary, possible and in Europe's interest. It is necessary to meet the long-term temperature goals of the Paris Agreement. It is possible with current technologies and those close to deployment.'

(Left to right) Jim Skea CBE FEI, Professor of Sustainable Energy, Imperial College London and Co-Chair IPCC Working Group III, together with Luis Cabra, Executive Managing Director of Technology Development, Resources and Sustainability, Repsol; Dev Sanyal FEI, Chief Executive, Alternative Energy and Executive Vice President, Regions, BP; Philip Fjeld, CEO, CNG Fuels; and Ole Rolser, Senior Solution Leader and Associate Partner, McKinsey, fielded questions from the floor after the session on 'A buyer's guide to low carbon technologies in reducing greenhouse gas emissions'

Photo: Oliver Dixon Photography

Oil majors – the challenge

The drive to de-carbonise energy, however, remains daunting and it is by no means clear that the 2°C Paris target will be achieved. Bob Dudley FEI, Group Executive, BP, told delegates that the oil and gas industry was facing a dual challenge – how to produce more energy while at the same time reducing emissions. ‘Renewables are set to rise faster than any other form of energy in history. Nonetheless, even under our “rapid transition” scenario the task of curbing CO₂ emissions will be difficult,’ he said. The BP ‘rapid transition’ model, contained in the company’s latest *BP Energy Outlook*, sees global energy consumption rise by around one-fifth from 2017 to 2040. This compares to an increase of one-third in the company’s alternative ‘evolving transition’ scenario.

The 2%/y growth in power will outpace the 0.8%/y growth in total energy consumption, as a result of a strong electrification process, commented Anne-Sophie Corbeau, Head of Gas Analysis, BP Group Economics, presenting the findings of the *Outlook* report at a breakfast briefing. With regards to CO₂ emissions, transport and industry contribute around 40% of CO₂ emissions among the end-use sectors in 2040, while buildings contribute just over 20%. CCUS is expected to come into its own and play a significant role in the decarbonisation of the energy system, accounting for one-third of the reduction in CO₂ emissions.

Meanwhile, Shell is also under no illusions as to the scale of the task. Andy Brown FEI, the company’s Upstream Director, described the seven essential elements – electrification of final energy; growth of new energy systems; energy efficiency; carbon pricing; CCUS; an end to deforestation; and a change in the mindset of the consumer – that will all need to be in place if the 2°C target is to be realised.

And Total sees nothing less than a complete rupture with the past if energy de-carbonisation is to be achieved, reported the company’s Arnaud Breuillac, President, Exploration and Production. Total’s energy outlook to 2040 contains two scenarios – a ‘momentum’ scenario and a so-called ‘rupture’ scenario. The latter, which is the preferred outcome, anticipates a combination of technological breakthroughs; ‘mass’ electricity storage; a ‘massive’ switch to renewable power generation; faster electrification in all sectors; and a steeper decrease of energy

intensity. The hoped for result would be a situation where energy demand, in some sectors, could drop to 2015 levels by 2040. But this would imply an improvement in operation efficiency, growth in natural gas, low carbon electricity, an increase in biofuels and investing in carbon sinks (both CCUS and forests).

OGCI tackles methane emissions

Methane, meanwhile, remains a problem for the gas industry. It is the primary component of natural gas but its warming impact is up to 30 times more potent than CO₂. So, even though global methane emissions are far lower than CO₂ emissions, leaks from gas wells and production facilities are a key climate issue across the oil and gas supply chain. As Shell’s Andy Brown noted: ‘Last year alone, North American methane emissions doubled.’

Work is currently being done under the auspices of the Oil and Gas Climate Initiative (OGCI) coalition of global oil majors to cut average methane intensity by at least one fifth by 2025. Outlining the scope of the work during the ‘Actions to tackle climate change’ session, Dr Pratima Rangarajan, CEO, OGCI Climate Investments, said that achieving the agreed 0.25% reduction goal by the end of 2025 would reduce the collective emissions of OGCI fossil fuel giants by 350,000 t/y of methane. This compares to the 0.32% methane intensity achieved by the original 10 OGCI members in 2017.

IMO 2020 target

With transport being such a key emitter of GHG, the decision taken by the International Maritime Organization (IMO) in October 2016 to set a global limit for the sulphur content of fuel for use onboard ships to a maximum of 0.5%, down from 3.5%, with effect from 1 January 2020, could be transformational. It will have far-reaching implications throughout the entire marine fuel supply chain. The conference heard that refiners will need to formulate and make process changes to ensure the supply of ‘compliant fuel’ while ensuring there are markets for the remaining residual fuels. Suppliers, meanwhile, will need to adjust handling, testing, documentation and record-keeping procedures to ensure their clients are able to demonstrate compliance.

Reporting on the results of a modelling study undertaken by Concawe, Damien Valdenaire Science Executive at Concawe, pointed to at least five elements

that could go wrong for refiners next year. Two are reputational, stemming from either engine failure and losing control at sea, or a market shortage. The other three are product quality, non-compliance, and high uncertainty with regards to investment. The study concludes that with the EU’s refining system, compliance of the new marine fuels by 2020 is not straightforward. An additional uncertainty is the implication for world region trade flows, particularly with the Middle East.

A promising start

If the aim is to de-carbonise the energy sector while at the same time delivering energy to an energy starved world, then a promising start has already been made. Moreover, the ability of governments and industry to come together and achieve a desired environmental outcome was amply demonstrated 30 years ago when a ban on CFCs succeeded in tackling the problem of the diminishing ozone layer. A recent UN study shows that the ozone layer is recovering at a rate of 1–3% per decade.

More recently, as one IP Week delegate pointed out during a Q&A session, there has been a remarkable transformation in the air quality of Beijing. ‘Five years ago Beijing’s citizens were choking in fumes from traffic, emissions from coal-fired power stations as well from other sources. The government took firm and decisive action. Today, while the city is not exactly bathed in an air of “Alpine purity”, there is no doubt that the improvement in quality has rendered it almost unrecognisable from what it was in the past,’ he said. ●



Presenting the findings of the BP Energy Outlook 2019, Anne-Sophie Corbeau, Head of Gas Analysis, BP Group Economics, explained that CCUS is expected to come into its own and play a significant role in the decarbonisation of the energy system going forwards, accounting for one-third of the reduction in CO₂ emissions under the ‘rapid transition’ scenario



‘At Climate Investments, we invest in solutions that lower methane emissions from the oil and gas sector, lower CO₂ emissions from energy and industrials and on carbon capture and utilisation and storage as a means to keep CO₂ from reaching the atmosphere.’

Dr Pratima Rangarajan, CEO, OGCI Climate Investments

Embracing the technology drivers

The global energy sector needs to pick up the pace of adopting innovative ‘disruptive’ technologies, reports Nick Cottam.

There’s innovation and there’s technology. Innovation, you could argue is the application of creative thinking to a problem. How, for example, do you do things differently to reduce greenhouse gas (GHG) emissions, streamline asset integrity or upgrade a refinery? Technology, on the other hand, is the application of that creative thinking.

Digitalisation

Once again, the partnership between innovation and technology was stridently discussed at IP Week 2019. Digitalisation was presented as the potential white knight in a range of areas. Faster, leaner, cleaner and more competitive are all potential benefits in a brave new digital world. However, as various speakers noted, the roadblock is an oil and gas sector which is often slow to adopt new technology and cautious to scale up when they do.

Think upstream to downstream, offshore platform to refinery, oil major to diversified energy company, and it’s not hard to see where the problem lies. There is a lot at stake in a volatile sector and technology suppliers are being asked to demonstrate the extent to which their products can play a part in the short- as well as the medium- and long-term.

Better decision making

‘The purpose of technology is to support better decision making,’ summed up Quintiq’s Uri Tenzer. ‘To do this we have to get closer to the customer. The main risk for any change in technology is change management.’ You could almost feel the collective shudder in the audience – while another speaker in the Thursday digital

session talked about the need for disruption and innovation to go hand in hand. Here again was a speaker reminding the audience of the importance of well planned, careful change management.

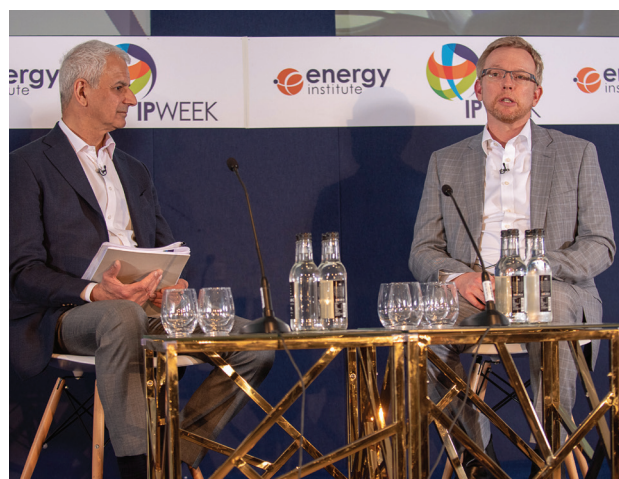
The industry take from BP Upstream Chief Executive Bernard Looney FEI was ‘we have to harness technology to make us more efficient’. Better decision making and more efficient in BP’s case, suggested Looney, meant having the wherewithal to manage a more diversified portfolio – more gas and renewables for example – that would continue to diversify as the balance of energy demand globally continued to transition.

Reducing GHG emissions

The need to cut GHG emissions is true for all the oil majors as they seek to respond to trends like the rise of renewables and increasing electrification. ‘Our industry has a major role to play in reducing GHG emissions,’ Arnaud Breuillac, Total’s President of Exploration and Production, told delegates. ‘Energy savings will be significant in future years and this will be driven partly by technology developments.’

Developments in such areas as artificial intelligence (AI), 3D visualisation and predictive analytics can all be expected to play their part. So too, in more general terms, can ‘big data’, which is already bringing new real-time efficiencies to core activities such as upstream drilling.

Harnessing data was a key theme of this year’s conference, which itself dovetailed into BP Group Chief Executive Bob Dudley’s overarching reminder that the industry has to do more with less. ‘Using energy more efficiently is absolutely essential,’ he



Ron Mobed FEI, Chief Executive, Elsevier (left), Chair of the ‘Digital revolution: the next frontier for digital technologies in oil and gas’ session, and Chris Rivinus, Program Lead Digital Transformation, Tullow Oil (right), who started proceedings with a presentation entitled ‘A people-centric approach to digital transformation’, fielded a number of questions from delegates

commented in his keynote address, highlighting the role of technology in driving improvements and encouraging oil and gas companies to get closer to their stakeholders – customers certainly, but also right along the supply chain.

Ten years ago, noted Dudley, technology was confined to the back office. Now it was out in the field, helping the industry earn its keep and get cleaner in what has become a highly competitive energy market. This year’s IP Week, perhaps more than ever, highlighted the fact that Dudley and other senior executives really do have technology on their radar as a catalyst for change. ‘Developments in AI and blockchain will deliver phenomenal changes in our industry,’ said Dudley. However, the flip side of this ‘tech nirvana’, he reminded the audience, was cyber security and the need for this to move up company agendas.

Blockchain to the rescue

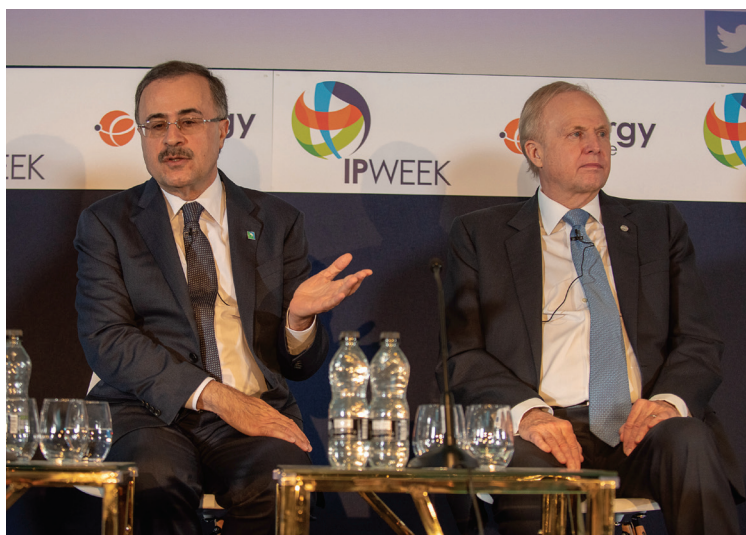
Such is the buzz around blockchain that the topic merited its own breakout session on the first day of IP Week 2019. The clue was in the title ‘Leveraging blockchain to drive business value’. The challenge, as noted by David Womack, Strategy and Innovation Leader with IBM Chemicals and Industries, is to deliver real life examples which make the case for the technology’s adoption.

Womack began with a definition: ‘[Blockchain] creates a distributed general ledger between participants to enable secure transactions using “smart



‘We have to harness technology to make us more efficient.’

Bernard Looney FEI, Chief Executive, Upstream, BP



Keynote speakers on the opening day of IP Week 2019, Amin Nasser, President and CEO, Saudi Aramco, and BP's Bob Dudley FEI, were both in agreement that things really are changing – technology initiatives are being implemented and quiet revolutions are taking place. They agreed that the reality was one of exciting change, with new technologies, better production techniques and cleaner, greener products, which were continuing to lift people out of poverty

contracts". So far, so good. Everyone gets to share the same information and contractual relationships are confirmed at each stage of the process. Out go all those paper-based transaction details – for example in an area like shipping – and in comes another piece of the digital transformation puzzle.

The shipping company Maersk, said Womack, who led the session, had achieved impressive results through a blockchain application called Trade Lens. With more than 10mn containers to manage, Maersk had streamlined the *de facto* and notoriously disjointed industry paper standard with blockchain. The result – 15% more volume for their bucks and greater efficiencies right down the line.

There were other examples in what Womack described as a \$2.8bn blockchain market forecast to rise to \$15bn by 2020. IBM, for example, is working with an oil major and an EPC (engineering, procurement and construction) company to deploy blockchain for tracking and reconciliation costs. The target is to achieve a greater than 5% cost saving on a project. While most of the oil majors run SAP (systems, applications and products) systems, the point about blockchain, said Womack, is that it creates a single shared ledger. The caveat in all this is you have to have a genuine need and there has to be the potential for blockchain to add value. 'Blockchain is user specific,' he added. 'We're just getting our feet in the water and learning how this drives value.'

Blockchain, like other technologies, must not only drive efficiencies but also demonstrate

that the industry is striving to be cleaner, greener and more fuel efficient. The elephant in the room was undoubtedly climate change, with technology also expected to play its part in the drive for cleaner fuels and GHG reduction. There may be a quiet revolution taking place behind the scenes in the way the industry operates, but all agreed that this needs to become more apparent and compelling to stakeholders.

Crisis of perception

Readers though, should take heart that things really are changing – initiatives are being implemented and quiet revolutions are taking place. Keynote speakers Amin Nasser, President and CEO, Saudi Aramco, and BP's Bob Dudley FEI were both in agreement about this. 'We need to change the way we connect and who we connect with,' was one of Nasser's 'Big 5' challenges* to turning around an oil and gas industry tanker that was still perceived to be off course by certain audiences.

Let's look on the bright side though. Both Nasser and Dudley agreed that the reality was one of exciting change – new technologies, better production techniques and cleaner, greener products which were continuing to lift people out of poverty. Indeed, this was a theme of the *BP Energy Outlook 2019*, which was presented in its usual breakfast slot on the second day of the conference.

There were two stand-out statistics. If we are to keep well within the 2°C temperature increase target set by the Paris Agreement on Climate change then 40% of oil and gas production

will have to be done in conjunction with carbon capture and storage (CCS). Also, noted Anne-Sophie Corbeau, Head of Gas Analysis, BP Group Economics, who presented the *BP Energy Outlook* findings, the radical step of banning single-use plastic would reduce the demand for oil by 6mn b/d.

Moving towards Energy 4.0

Perhaps inevitably, innovation and technology was another of Nasser's Big 5 challenges – to drive efficiency and also to attract the attention of tech-savvy millennials who might be tempted to work in the industry. 'We need to inspire them,' said Nasser, 'by the incredible possibilities of Energy 4.0.'

As we know, they are the Facebook generation. They live and breathe via a small screen that in our business must itself provide a visual interface to a modern, more connected oil and gas sector. The energy sector must demonstrate that it understands this in order to engage the workforce of the future. ●

*Nasser's 'Big 5' challenges call for better communication with all stakeholders to show how the industry understands society's expectations and concerns; to show the industry truly embraces its social responsibilities regarding safety and the environment; continued focus on innovation and technology to reduce emissions and carbon intensity for future generations; in terms of investment, reminding stakeholders that oil and gas is responsible for much of economic growth, today and in the future; and lastly, changing the way in which the industry connects to its stakeholders.



'The \$2.8bn blockchain market is forecast to rise to \$15bn by 2020.'

David Womack, Strategy and Innovation Leader, IBM Chemicals and Industries



IP Week 2019 delegates had extensive networking opportunities during coffee breaks and lunches at the InterContinental Park Lane Hotel in London, which also housed the IP Week exhibition



Photo: Oliver Dixon Photography

Pressing ahead

The shifting sands of the global energy industry herald an exciting era of diversification in the Middle East's energy sphere, writes Sean Evers, Managing Partner, Gulf Intelligence.



Photo: Gulf Intelligence

(Left to Right) Mostefa Ouki, Senior Research Fellow, Oxford Institute for Energy Studies; Waddah Ghanem Al Hashmi, Senior Director – Sustainability, Operational & Business Excellence, Emirates National Oil Company (ENOC); Azman Aziz, Senior General Manager, Strategy & Commercial Division, Petronas; Abdulkarim Al Maazmi, Executive Director, Exploration & New Ventures, Dragon Oil; and Dawood Nassif, Board Director, The Bahrain Petroleum Company (BAPCO) fielded a number of questions from the floor during the Middle East session, moderated by Sean Evers, Managing Partner, Gulf Intelligence

No wonder the Middle East is overhauling its game plan – 100mn barrels of oil are now consumed worldwide every day in a \$60/b market. The result? Demand and competition are intensifying at a time when expenditure budgets must be delicately managed. Plus, momentum behind the energy transition towards a lower-carbon world is in full flow, with petrodollars rapidly finding their place on the growth trajectory for renewables and energy efficiency initiatives. The Middle East faces a cliff of challenges – but it is scaling it with flair.

A stable oil price outlook is helping Middle Eastern energy stakeholders navigate this uncharted territory – for now. A \$60/b range is likely for the rest of the year, agreed more than half (52%) of respondents to a GIQ

Industry Survey at the 3rd Gulf Intelligence Middle East Energy Summit at IP Week 2019. Meanwhile, 56% of respondents believe the region is keeping pace with the energy transition, which has an estimated global value of \$1tn/y. Siemens' forecast that countries in the Middle East can more than triple their share of renewable energy from 5.6% in 2016 to 20.6% in 2035 certainly buoys sentiment, as does region-wide support of the Paris Agreement, Gulf governments' green-themed national visions and subsidy cuts.

First mover advantage

The Middle East is also ahead of the curve of the biggest shift in the global shipping industry since engines replaced sails in the late-1800s – IMO 2020. Months are rushing by until the International Maritime Organization's (IMO) ruling to reduce bunker fuels to 0.5% from 3.5% sulphur content comes into play on 1 January 2020.

Wood Mackenzie said compliance could add \$60bn a year to global bunker fuel costs. The energy market – from refiners through to shipping companies – is understandably nervous. In a market awash with ambiguity, the Port of Fujairah, the world's second largest bunkering hub, has already introduced compliant fuel.

The port's first-mover advantage carries more than just commercial gold stars; confidence in the Middle East's proactivity has undoubtedly deepened. This is

especially good news for attracting the big-ticket investments required to meet the 55% growth in the region's energy consumption that the *BP Outlook* anticipates up to 2040.

Digital revolution

Middle Eastern companies' – both state and privately owned – adoption of tools under the umbrella of the 4th Industrial Revolution are also accelerating. Digitalisation could unlock up to \$2.5tn of industry and societal value in the global oil and gas markets in the medium-term, according to the World Economic Forum. ●

International Oil Diplomacy Person of the Year Award

HE Suhail Al Mazrouei, Minister of Energy and Industry in the UAE and Former President of OPEC (2018)

Burning the midnight oil in meetings in Vienna to reach a consensus between the 25 nations of OPEC+ by sunrise requires a key ingredient – excellent diplomatic nous. Therein lies HE Suhail Al Mazrouei's skill as President of OPEC; gently but firmly shepherding a myriad of cross-continental agendas towards a common goal. Mazrouei engaged all players in negotiations – no matter their size or global standing – to nurture a sense of 'all for one and one for all'.

The proof is in the numbers – conformity since the Declaration of Cooperation of OPEC+ began in January 2017 was 116%. He also played a key role in restructuring the energy sector in Abu Dhabi and the advocacy and implementation of subsidy reform in 2015, a brave and controversial move that influences progressive policies in the Arab Gulf today.

Asian alliances – continuity pays

Ignorance of developments in China and the wider East is a death knell in any energy business. Headlines pronouncing the end of China's golden growth era are missing a key word – context. Yes, China is experiencing its lowest annual growth rate since 1990 – ie below double-digits. And yes, it may have a mild short-term impact on energy demand and economic growth. But have no doubt, Beijing still wears the world's shiniest economic crown.

The International Monetary Fund (IMF) said China's GDP growth will climb by 6.2% this year. Such a forecast would fill the world's other top five leading economies – the US, Japan, Germany, the UK, France – with glee. PwC expects Beijing to manage the world's largest GDP by 2050, followed by India and the US. Energy stakeholders in the Middle East – exporters, port operators, upstream companies and many more in the value chain – must set aside questions over China's prosperity and deepen their footholds in what will soon be the world's biggest economy and energy consumer.

The latest illustration of deepening Asian alliances is Abu Dhabi National Oil Company (ADNOC) awarding South Korea's SK Engineering and Construction the engineering, procurement and construction (EPC) contract to build the world's largest single underground project ever awarded for oil storage. The \$1.21bn project at the Port of Fujairah will have capacity to house 42mn barrels of storage on completion in 2022.

New energy frontiers

Africa, Russia and the Caspian were put under the spotlight at IP Week 2019.

Robert Beaman, S&P Global Platts, and Petroleum Review's Kim Jackson report.



The nascent East African hydrocarbons industry, if developed in the right way, represents one of the main drivers of growth in Africa's oil and gas sector moving forward, according to Maikanti Kachalla Baru, Group Managing Director for NNPC

Change was in the air at the IP Week 2019 Africa session, with upstream activity spreading into new frontier regions, and downstream projects holding out the promise of reshaping the continent's energy use. Increasing utilisation of gas resources and a growing need for international co-operation to solve energy problems, are increasingly important.

The session was opened by Maikanti Kachalla Baru, Group Managing Director for NNPC, who noted that sub-Saharan Africa leads the world in terms of the number of giant oil and gas discoveries, while exploration activity is increasingly moving beyond its traditional boundaries into the continent's frontier regions of eastern and southern Africa. Transformative oil and gas finds have continued despite a drop-off in capex since 2014, but with exploration spending set to increase dramatically between now and 2030 there is likely to be more to come.

Africa's high proportion of heavy sweet crudes stands the continent in good stead ahead of the IMO 2020 0.5% global sulphur cap on marine fuels, according to Robert Beaman of S&P Global Platts, with crudes from countries such as Angola, Congo and Chad set to play an increasingly important role. Refiners, keen to produce the new VLSFO (very low sulphur fuel oil) grade, are expected to scour the world for heavy sweet feedstocks, and heavy sweet African crude oil grades are likely to see rapidly-increasing demand.

The shift from oil to gas production was an important factor for the speakers, with several highlighting the change, particularly in light of Total's recent Brulpadda discovery offshore South Africa.

Although gas has historically been considered incidental to oil exploration in Africa, a growing need for energy has resulted in a

move by African states to better-utilise gas resources across the continent. The key, according to Okechukwu Mba of Nigeria's Seplat Petroleum Development Company, is that the export-orientated gas industry now 'needs to be used domestically to drive growth' through projects such as flare-reduction. With Africa's largest gas reserves of 199tn cf, Nigeria holds out the potential to 'grow from a source of revenue earnings to an economy enabler', Mba said.

Nevertheless, monetising this resource remains a key challenge, with Alex Vines of Chatham House noting that the problem wasn't about finding or producing gas, but rather about 'how to [guarantee] get[ting] paid for gas in Africa'. The region's hydrocarbons sector faces a number of challenges, Vines said, most notably ongoing political risk.

Infrastructure was an important theme for Samaila Zubairu, CEO of Africa Finance Corporation, who discussed not only the physical, but also the political and legal infrastructure needed to do business. In some markets, he said, it remains easier to import goods into Cameroon from distant China than from the country's western neighbour, Nigeria.

With such challenges remaining in place, Baru said that it is important for the nascent East African hydrocarbons industry to guard against 'unrealistically-high expectations'. However, if developed in the right way, he saw the region as representing one of the main drivers of growth in Africa's oil and gas sector moving forward.

A session on funding reiterated the point that there is no shortage of oil and gas projects to invest in within Africa, adding up to a huge funding requirement. Standard Chartered Bank's Ade Adeola FEI said that, with the ability to pick and choose, the projects with the highest returns would inevitably win out.

One of the key projects was the integration of Africa's energy markets which, according to Ernesto Bonafe of the International Energy Charter, remains incomplete. While two-thirds of the population of sub-Saharan Africa live without electricity,

Bonafe said the region has 'vast untapped renewables potential', as well as its well-known strengths in oil and gas. Making use of these resources, particularly natural gas, holds out the possibility of eventually achieving universal energy access.

While attention has focused on the upstream until now, the downstream and Africa's demand-side promise to be of at least equal importance. The continent's refining sector could stand on the verge of a renaissance, with Baru noting that Nigeria in particular 'ultimately wants to refine all the crude produced locally'. The planned launch of the huge Dangote refinery (estimated investment \$9bn, expected completion 2019, doubling Nigeria's refining capacity) will be a game-changer for the continent, completely reshaping the balance between West African markets and European refineries, he said.

Russian focus on LNG

Like the double-headed eagle at the centre of the country's state seal, Russia is looking simultaneously both east and west to secure markets for its oil and gas, noted Gerald Rohan FEI, CEO, Rohan Global Consulting, opening the Russia session at IP Week 2019. These resources have formed a key part of the Russian economy for decades, with LNG set to play an increasingly important role going forwards and new gas markets being developed in sectors like maritime, rail, buses and automobiles.

Setting the scene, Cederic Cremers, Executive Vice President Russia, Shell, stated that global demand for LNG has continued to rise, with growth of 27mn tonnes in 2018 outstripping market expectations and 'fully absorbing' supply growth from new projects coming onstream. He said this trend was expected to continue as the world moved to a low carbon future. Furthermore, Cremers suggested there was no LNG supply glut on the horizon so long as gas was cost competitive in relation to coal and renewables.

Cremers noted that while Russia is currently the world's second largest producer of natural gas, and the world's largest exporter, the country accounts for just 5% of global LNG production. As a result, there is a huge opportunity for Russian LNG, with Shell forecasting up to five-fold growth within the next decade or so, to reach around

15% of global liquefaction capacity – possibly more.

Presenting what Shell was doing in a bid to monetise more than 3.3tn cm of Russian natural gas into competitive LNG, Cremers highlighted Russia's three major gas production hubs – the eastern hub of Sakhalin 2, Russia's first LNG project, currently producing 11.5mn t/y, with a third train planned; the Yamal LNG in the northern polar region, whose three 5.5mn t/y trains reached full capacity in 2018; and Baltic LNG, the western hub, which will produce 10mn t/y of LNG at two trains supplied from the Yamal gas reserves.

Mark Anthony Gyetvag, CFO, Novatek, profiled another key Russian gas project – Arctic LNG 2 – due onstream by end-2023. Both it and the Yamal LNG project will deliver gas to international markets via a fleet of ice-class LNG carriers that will be able to use the Northern Sea Route for cargoes destined for Asia.

Looking at the competitive position of Russian natural gas in Europe, James Henderson, Director, Natural Gas Research Programme, Oxford Institute for Energy Studies (OIES), noted that two key premises surrounded Russian gas competing with US LNG in Europe – the Rouble foreign exchange rate (FX) and the price of Henry Hub gas. He said that at the current rate of \$1=RR66, US LNG is competitive on a short-run marginal cost basis at a Henry Hub price of approximately \$2.75/mn Btu or below. Over the longer term, however, it seemed that Russia's optimal strategy would be to keep the European gas price between the short- and long-run marginal cost of US LNG, which pointed to a theoretical target gas price of \$4.25–7.50/mn Btu.

The session closed with a presentation from Otabek

Karimov, Vice President for Commerce and Logistics, Rosneft, who noted that the company is planning to increase gas production at its existing gas resource base in Russia by more than 30bn cm in 2020+. The company also plans to diversify operations, including development of a CNG fuel retail network in Russia via a joint venture with Beijing Gas, a fleet of LNG-powered Aframax vessels and an LNG bunkering market.

Caspian developments in the pipeline

'The Caspian region is one of the oldest oil and gas production regions in the world, and one of the most significant, not just in terms of the volumes that it is producing but in terms of the security of supply that it will deliver to Europe,' said Rt Hon Charles Hendry HonFEL, Chair of the Caspian session at IP Week 2019.

Presentations from Kate Mallinson, Associate Fellow, Russia and Eurasia Programme, Chatham House, and Mehmet Ögütçü, Founder and CEO, Global Resources Partnerships, provided an overview of the Kashagan oil field, the Southern Gas Corridor (SGC), and the complex energy issues and geopolitical interactions between the Caspian and its neighbouring countries.

Delegates heard how the Kashagan field, holding some 4.8bn tonnes of oil, and which came onstream in 2016 after many problems and delays, has been a key driver of Kazakhstan's economic progress and is regarded as an oil market game-changer in the making.

Meanwhile, the SGC is set to transport Caspian gas directly into the heart of European markets for the first time. From the South Caucasus pipeline crossing Azerbaijan and Georgia, some

6bn cm/y of gas is transported to Turkey through the Trans-Anatolian Pipeline (TANAP), which was inaugurated last year. When complete in 2021, the Trans-Adriatic Pipeline (TAP) will supply a further 10bn cm of gas as far as Greece, via Albania and on to Italy.

Ögütçü noted there is significant potential for much more Caspian gas to head to Europe. 'If the demand is there and if the geopolitical, financial, environmental and technological hindrances can be overcome', he said. For example, Azerbaijan could supply up to 50bn cm if projects currently under consideration, such as Absheron, Babek and Shak Deniz 3, come onstream. Meanwhile, Turkmenistan has promised to supply 30bn cm through the Trans-Caspian pipeline to Turkey – although Ögütçü believes Russia would likely continue to block this happening for the foreseeable future as Turkey is its number two customer for gas (the first being Germany) and the country doesn't want to see its dominance undermined.

He also noted that the SGC is not without competition, with TurkStream 1 set to export 15.75bn cm/y of Russian gas to Turkey across the Black Sea later this year. TurkStream 2 is to deliver the same volume of gas to southern and south-eastern Europe, although the exact route has yet to be agreed. There are two options – one through Greece to Italy, like TANAP and TAP; the other through Serbia to Baumgarten in Austria. Ögütçü believes the second option is most likely to go ahead, although he anticipates problems due to the EU's 3rd Energy Package, similar to issues currently facing the NordStream 2 project.

Delegates also heard how LNG may threaten the future growth of Caspian piped natural gas, as the prices for both are converging while LNG provides greater flexibility. Ögütçü noted Turkey already has two LNG receiving terminals and two floating storage regasification (FSRU) facilities, which will have the capacity to store some 11bn cm of LNG from next year, 'giving Turkey enormous capacity to negotiate better deals' when long-term take or pay contracts expire in 2021. ●



'[There is significant potential for much more Caspian gas to head to Europe] if the demand is there and if the geopolitical, financial, environmental and the technological hindrances can be overcome.'

Mehmet Ögütçü,
Founder and CEO,
Global Resources
Partnerships



A lively question and answer session followed Professor Keun-Wook Paik MEI, Associated Fellow, Energy Environment and Resources, Chatham House, and Anna Mikulska, Non-resident Fellow in Energy Studies, Rice University's Baker Institute for Public Policy, presentations on Russia's strengthening relationship with China and the geopolitical issues influencing supply and demand patterns for Russian gas

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'Data has been central to this industry for so long...the amount of things that are interconnected today has exploded, so opportunities to garner insight from new sources of data...has grown exponentially.'
David Womack, IBM



'Reducing methane emissions is a no-brainer for the oil and gas industry...the challenge will be to make sure that good methane practice is rolled out across the industry.'
Prof Jim Skea CBE FEI, CCC, IPCC



'Technology is advancing...but this is the critical point, we should invest in human resource much more, together with technology - then we will have educated, skillful people who can use the technology and make better decisions.'
Serkan Sahin, Refinitiv