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Special Report

2019

The Year Ahead: The Good, the Bad, the Unpredictable!

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2010 GI 2019 10 YEARS ANNIVERSARY

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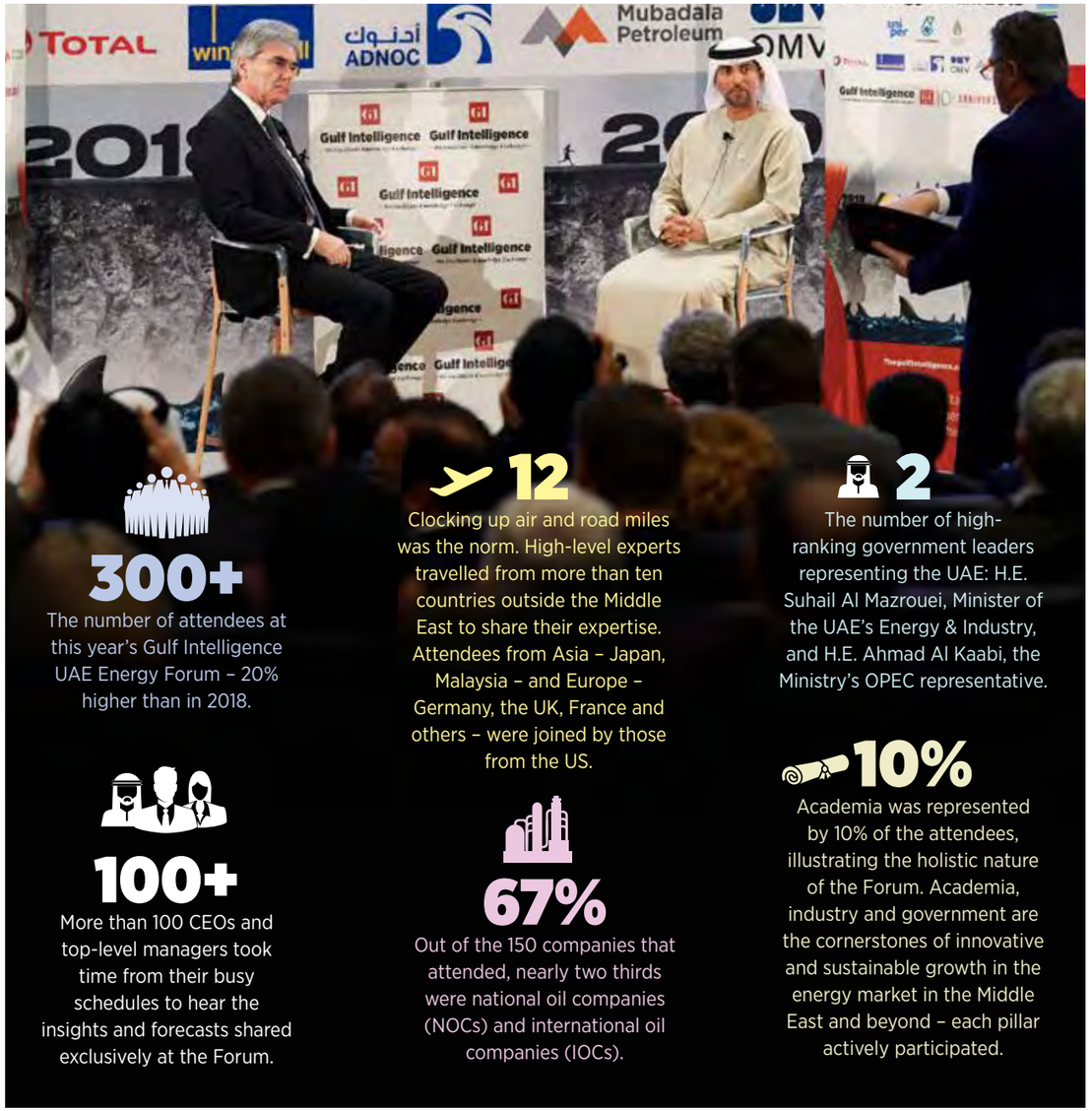
UAE Energy Forum 2019

Exclusive content detailed in this Special Report was harvested from the UAE Energy Forum in Abu Dhabi in early 2019. It details high-level insights on the macro outlook of the Middle East's energy market; the opportunities, the pitfalls, the disruptors. Energy stakeholders must stay on their toes as the industry enters more uncharted territory, from the energy transition and soaring demand to digitalization and frosty geopolitics. So, what's next?



300+
The number of attendees at this year's Gulf Intelligence UAE Energy Forum – 20% higher than in 2018.

100+
More than 100 CEOs and top-level managers took time from their busy schedules to hear the insights and forecasts shared exclusively at the Forum.

12
Clocking up air and road miles was the norm. High-level experts travelled from more than ten countries outside the Middle East to share their expertise. Attendees from Asia – Japan, Malaysia – and Europe – Germany, the UK, France and others – were joined by those from the US.

67%
Out of the 150 companies that attended, nearly two thirds were national oil companies (NOCs) and international oil companies (IOCs).

2
The number of high-ranking government leaders representing the UAE: H.E. Suhail Al Mazrouei, Minister of the UAE's Energy & Industry, and H.E. Ahmad Al Kaabi, the Ministry's OPEC representative.

10%
Academia was represented by 10% of the attendees, illustrating the holistic nature of the Forum. Academia, industry and government are the cornerstones of innovative and sustainable growth in the energy market in the Middle East and beyond – each pillar actively participated.

Calling Card of OPEC+? Agility and Unity

INTERVIEW

H.E. Suhail Mohamed Al Mazrouei
Minister of Energy & Industry, UAE
Former President of the OPEC Conference 2018

Moderator: Hadley Gamble, Middle East Anchor, CNBC

Hadley Gamble (HG): *We witnessed a roller coaster ride in oil prices in 2018. OPEC was quite conciliatory when it came to what US President Trump was trying to do with Iranian sanctions. You were willing to play the game to make that work. Then, the waivers came unexpectedly and pushed prices lower. What's the OPEC and OPEC+ strategy for 2019?*

5
OPEC+ did a good job at stabilizing oil inventories at the five-year average in 2018. What will 2019 hold?

H.E. Suhail Al Mazrouei: Overall, last year was a good year in terms of recovery and we achieved our target of stabilizing the market at the five-year average. The fluctuation and volatility were huge and not acceptable. It was geopolitics in the second half of 2018 that played the most counterproductive role. Last summer, everyone, including consumers, were under the impression that sanctions would be enforced. The question was how this supply would be replaced, so OPEC stepped in. We are not interested in playing politics. We hear what the US says as a major consumer and producer, but we will always do the right thing from our perspective to maintain balance. We increased production ahead of November. The waivers then came in and we dealt with this swiftly and changed our strategy, which began to take effect in correcting the market as soon as early December.

HG: *Last year, OPEC continued to work hard at nurturing its new relationship with non-OPEC countries, including Russia. Can you trust President Trump at this point not to disrupt this?*

H.E. Suhail Al Mazrouei: We are not in the business of trusting presidents. We are in the business of watching the market and correcting it when geopolitics affects it, such as in times of war or sanctions. And let's remember it's not just Iran where we have production uncertainties. We see disruption in many other countries in OPEC and outside the group. Historically, we have dealt with this by adjusting volumes to ensure we keep things in balance.

HG: *What concerns do you have around geopolitical headwinds in 2019?*

H.E. Suhail Al Mazrouei: One is the potential of more heated trade war talks between China and the US. This will not only affect OPEC, but the global economy. I tend to be more optimistic that we won't see this materialize and that a resolution will be reached this year or by early 2020. Another factor to watch out for is how much shale oil is produced. We need to advise that it has to be reasonable.

HG: *Is it time for OPEC to change tack and admit that the strategy has not worked and that the shale industry continues to grow?*

H.E. Suhail Al Mazrouei: It has worked. We have corrected the market despite huge growth from shale. Our tactic was not to slow down shale. It was to ensure that we take any oversupply off the market and we were helped in this by healthy oil demand growth. We will need to see what the real demand growth rate is this year versus the current expectations of a slowdown. We may be pleasantly surprised to the contrary. Another factor to consider with shale to an extent is that the infrastructure needed won't be ready until the fourth quarter this year.

What is critical is for us to continue to build capacity. The US may increase production for 2-3 years but when that slows down, other producers need to be ready to ensure the world is well supplied. The reality is that demand is growing at a healthy rate and we need to continue discovering oil. Countries that have invested in technology and in increasing their output capacity will be able to take advantage of market share when it surfaces, perhaps at the expense of others who are losing significant production.

We want to make sure that companies like Saudi Aramco or ADNOC, and also US shale producers, are not deterred from continuing to invest due to inadequate returns. We don't want to witness 2015-2016 again. Our mission is to help keep the market in balance for all. We have to watch and correct.

> **"We are not in the business of trusting presidents. We are in the business of watching the market and correcting it when geopolitics affects it, such as in times of war or sanctions."**

116%
The overall conformity level since the beginning of OPEC+'s 'Declaration of Cooperation' in January 2017 is well above 100%, coming in at 116%, according to the Joint Ministerial Monitoring Committee (JMMC) on January 18 this year.

176
The 176th meeting of the OPEC Conference in Vienna will be held on 17 April this year. A day later, OPEC+ will have its ministerial meeting in the same city.

1960
OPEC was founded in Baghdad in September 1960 by five countries: Iran, Iraq, Kuwait, Saudi Arabia and Venezuela.

HG: *Some have questioned the relevance of OPEC as a group going forward. We saw Qatar leaving last year. Are you expecting any more departures?*

H.E. Suhail Al Mazrouei: OPEC will always be here. We have had more countries joining in the last two years than leaving. Look at what happened to the market in 2015-2016 when it was flooded with oil, but OPEC did not act. Doing so at the time would have destroyed 4m-5m barrels of our market share, which we may not have gotten back. It didn't make sense for us to do anything. But because OPEC did not step in, prices dropped, shale production fell almost 1m b/d, the world economy slowed, unemployment rose and companies were bankrupted. The US oil industry suffered. Today, we are in a much better situation and shale producers have also learned the lesson of not overdoing it and are adjusting production based on market fundamentals. In terms of Qatar's decision, this was sudden, and we don't really understand the logic behind it. It's their sovereign right to do so, but it won't change market fundamentals in any shape or form as Qatar is a small oil producer.

HG: *Will we see prices above $80/bl in 2019?*

H.E. Suhail Al Mazrouei: It is not logical or practical for OPEC to try and achieve a price. We must accept a price which balances the market and that is good for both consumers and producers; not so low that it deters investment nor so high that it threatens economic growth. ■

**Edited transcript*

The Wild Card: GEOPOLITICS

H.E. Suhail Al Mazrouei, Minister of Energy & Industry, UAE, President of OPEC Conference 2018
Joe Kaeser, President & Chief Executive Officer, Siemens AG
Moderator: Sean Evers, Managing Partner, Gulf Intelligence

Sean Evers (SE): *How has Siemens fared with the accelerated decline of growth in China and what's your outlook on its impact on the world economy?*

Joe Kaeser: We still saw decent growth in the last quarter of 2018 for China and the nature of our business is infrastructure, so it's more predictable and not so dependent on changes in the short-term turnover of consumer products, for example. What we know is that if the world does not continue to have free and fair trade as the mantra for cooperation, everybody pays a price. That's the lesson learned from last year. We need to keep an eye on geopolitics and in the interim as a company, get on with the business of looking at our customers and their market.

1.2mn
Is the OPEC+ group's 1.2m b/d cut enough to compensate for China's economic slowdown? Yes, for now.

SE: *In the fourth quarter of 2018, exports from the Gulf to China fell to a one-year low. Oil exports in Africa and the Middle East fell by 1.5m b/d, with two thirds of that lost from the Gulf going to China in December versus August. Is the OPEC+ group's 1.2m b/d cut enough to compensate for China's slowdown?*

H.E. Suhail Al Mazrouei: Yes, 1.2m b/d is enough. There is also the fact that three OPEC countries are not part of the recent deal and two of them are already in production decline. No one knows what will happen to Iranian production and the extension of waivers, but Iran is not going to add production. And then we have Venezuela's decline.

SE: *President Trump becomes the swing producer by deciding how much oil Iran can produce going into an election cycle. He is probably going to want lower prices.*

H.E. Suhail Al Mazrouei: Lower prices are not good for the US economy. The US today is the largest producer in the world, but this won't continue if prices are not right. When prices dropped in the last two months of 2018, we saw how production slowed down. There is a frustration amongst investors that they are losing money, so they won't want to see prices at $40/bl or $45/bl.

Joe Kaeser: I believe in the long term. The world needs to get prepared for a less hydrocarbon dominated economy and some countries like the UAE have been doing so already, changing infrastructure and resource allocation to other areas very successfully. Siemens established its offices in Masdar City here and as a result we are saving 55% of energy and 47% of water resources. When it comes to the transition, we need to go by facts and operate one step at a time. Oil demand is still growing every year by 1%-2%, depending on varying economic factors. The energy transition may take a century rather than decades and jumping to things too quickly could be devastating for economies. We need to be mindful about what is right from the intent and how we execute in the areas that really matter. Siemens has been pushing massively on consolidation in the renewable sector. Today we are the largest renewable energy company in the world with the Siemens Gamesa (wind turbines) venture.

SE: *Are there particular challenges to the economic opportunity in your peer group of companies?*

Joe Kaeser: Any massive change, like the 4th Industrial Revolution, typically causes a reduction in the value chain. This is great for customers, but also takes out hundreds of thousands of resources. We must also bear in mind that the transition is not just about the Internet of Things (IoT) or Industry 4.0; it is also about climate change. We've got to have a plan and execute it diligently. Otherwise, this is nothing but a distraction.

SE: *Does 2019 signal a turning point or an acceleration of the Paris Agreement?*

H.E. Suhail Al Mazrouei: We are only seeing the tip of the iceberg today. We will see more renewable energy projects in the UAE in the coming two years and several more during the next decade, up to 2030. Our energy plan targets renewables to contribute 50% to the total mix by 2050 and we have worked very hard on restructuring ourselves. One example is the recent launch of the Emirates Water and Electricity Company to drive efficiencies in our water and power sectors.

SE: *What is the outlook for nuclear power coming online in the UAE?*

H.E. Suhail Al Mazrouei: There will be a bit of a delay, but it is coming. Nuclear is base load and is required as part of our energy mix. Coupled with renewables, it will reduce the growing demand that we have on gas and allow us to become self-sufficient. To achieve all this, we rely on technology providers like Siemens and GE to innovate and come up with cost-effective solutions that use less gas and are more environmentally friendly. For example, we expect to save around 30% with the new generation of turbines versus the fleet that we have today. ■

**Edited transcript*

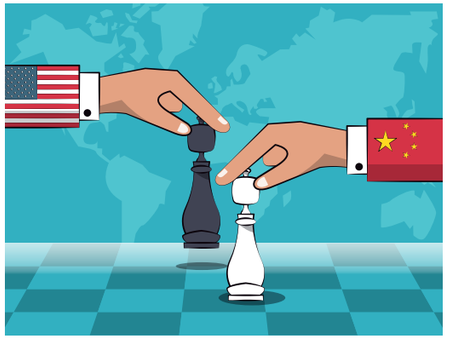
#1
The US-China trade war is at the top of energy stakeholders' worry list for 2019. A US investigation into Chinese trade policies escalated into tariffs on billions of dollars' worth of Chinese products in 2018.

$60s/bl+
The US is now the world's largest oil producer, while the Middle East is the world's largest oil producing region. The US' position at the top of the producing pyramid relies heavily on sustaining oil prices at current levels, or above. A decline will sap shale investors' momentum, weakening the behemoth's output.

6.2%
China's slowdown justifiably has alarm bells ringing, but context is vital. The country will still post 6.2% growth in GDP this year – one of the highest worldwide, according to the International Monetary Fund (IMF). Comparatively, the US and the UAE are expected to post 2.5% and 3.7%, respectively.

50%
Will the UAE's plan to use renewables to meet 50% of its energy needs by 2050 work? Most likely, but it requires restructuring along the entire value chain, including significantly improving consumers' habits.

47%
Siemens established its offices in the UAE's Masdar City. It is now saving 55% of its energy and 47% of water resources.



Who's in checkmate in 2019?

"The largest unknown in 2019? Geopolitics and where we are in terms of the trade war talks between China and the US."

GIQ

INDUSTRY SURVEY RESULTS

Will Black Gold Shine?

Brent crude oil averaged $45.13/bl in 2016; $54.71/bl in 2017; and $71.34/bl in 2018. What will be the average price of Brent crude oil in 2019?

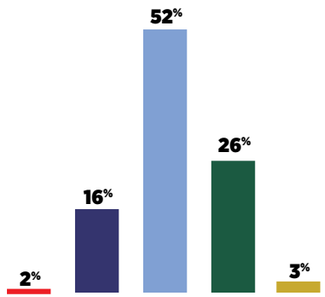
A. $40s or lower

B. $50s

C. $60s

D. $70s

E. $80s or above



Following the OPEC+ agreement in Vienna in late 2018, what level of compliance do you expect the alliance to achieve during the first half of 2019?

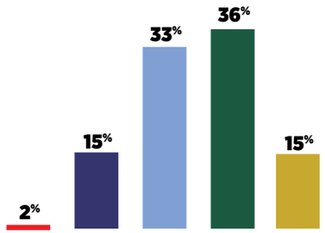
A. 150% or above

B. 120%

C. 100%

D. 90%

E. 80% or below



Aside from OPEC+, which of the following should we watch with the keenest eye to forecast oil prices in 2019?

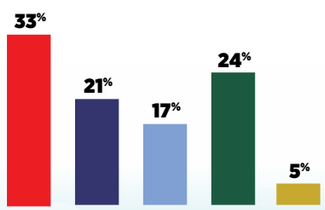
A. US-China trade war

B. Enforcement of sanctions on Iran

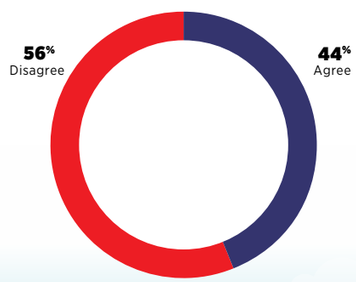
C. Rising interest rates and end of quantitative easing i.e. end of cheap money

D. Donald Trump: what has he done now?

E. Shale oil



Sir Mark Moody-Stuart, the former Chairman and Managing Director of the Royal Dutch Shell Group and a board member of Saudi Aramco for more than a decade, advocates that low-cost oil producers should stop carrying higher cost producers. OPEC must change its current strategy of prioritizing higher prices in favor of fighting for market share.



Money Matters

H.E. Suhail Al Mazrouei, Minister of Energy & Industry, UAE, President of the OPEC Conference 2018
Marios Maratheftis, Partner & Chief Economist, The Governance Creed
Fabio Piano, Provost, NYU Abu Dhabi
Moderator: Sean Evers, Managing Partner, Gulf Intelligence

Marios Maratheftis: The current situation of inflated asset prices across the world would usually lead to a correction, but the problem is that we don't know when this will happen. If it is as soon as 2020, it will be difficult to recover because cutting interest rates then will not really help the private sector recover. I expect that we will avoid a recession this year, but we will see a slowdown in the latter part of 2019 as policy sets in. We should see a solution to the trade concerns between China and the US, which is positive. But the two main concerns are the US' Federal Reserve interest rate hikes and that the private sector is realizing it has indulged and become complacent and so will move to divest all at once across various asset classes. The drivers behind the global growth that we have seen, which reached its peak in September 2017, were cyclical in nature and not structural. They will come and go. Since September 2018, we have had many negative shocks happening at the same time: President Trump's move on Iran sanctions, a slide in economic activity across the world and incredibly weak economic performance in China. The pendulum will settle somewhere in the middle between the extreme pessimism of November and extreme optimism of a few months earlier.

> **"The pendulum of sentiment will settle somewhere in the middle this year, between the extreme pessimism of last November and extreme optimism of a few months earlier."**

Sean Evers (SE): *Has the US political scene become a wild card for the world economy?*

Marios Maratheftis: It is a wild card right now. Trade wars at this stage of the economic cycle would be devastating, further inflating the impact from the US' Federal Reserve interest rate hikes. Other central banks would likely follow with aggressive hikes, resulting in a significant slowdown in the world economy.

SE: *Your Excellency, what are your thoughts on the outlook for 2019 from OPEC's perspective, especially with the events of late 2018 in mind?*

H.E. Suhail Al Mazrouei: Unlike the overall economic picture, the situation on oil inventories and supply and demand is better than ever. We achieved the five-year average in inventories last summer and were prepared to adjust production upwards in response to customers' needs and to meet the expected shortfall in supply from Iranian sanctions. This was then disrupted by the President of the US in November and we very quickly decided to stop increasing production and started to cut. Even before the December OPEC meeting last year, some countries like Saudi Arabia had already committed to reduce their December output. It is the fear of a trade war and other factors that create anxiety in the market and cause the sell-off we saw.

SE: *The China slowdown is also a tangible macro demand issue.*

H.E. Suhail Al Mazrouei: If it was an imminent threat, then you would have seen a larger increase in inventories of between 70m-100m barrels a month triggered by a slowdown in consumption. All things remaining equal, the OPEC+ cut of 1.2m b/d will take at least 30m barrels out of the market in January 2019. Then you are back to balance, so I am optimistic about the first quarter of this year. Of course, we are not living on an island and other factors will impact the market, but we need to also realize that production from Iran, Venezuela and Libya is not there and it will continue to fluctuate. What is clear today is that OPEC and non-OPEC are providing the safety valve and certainty that the world economy needs, and we are working very hard to reduce the fluctuation in the system.

SE: *We still have the constant disruptor of shale oil on the market. It continues to defy all expectations on the upside.*

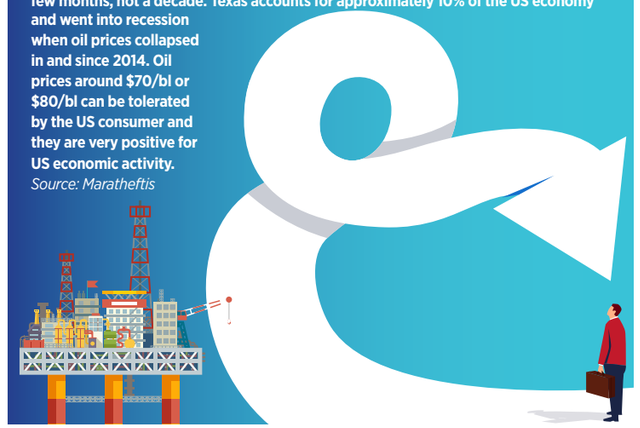
H.E. Suhail Al Mazrouei: We all know that the current rate of US production is not sustainable for longer than a year or two, so we need to be ready to step in and fill that gap when US output starts falling. Projections say that by 2030, US production will not be at today's levels. The UAE by contrast plans to increase its production from 3.5m b/d today to 5m b/d by 2030 and other OPEC producers have similar plans. We are trying to produce at a rate that is balanced and equivalent to what the world needs while encouraging investment. If prices are too low, shale oil producers are the first to cut because of their transportation and infrastructure costs and we don't want that as we need them to continue producing. We also want to avoid very high oil prices, which would slow down the world economy. ■

**Edited transcript*

US shale: Mounting pressure?

Contrary to what President Trump says, low oil prices are not good for the US. In the past, its oil industry was very slow to react to changing prices. It was a long-term producer and changes one year to the next did not affect production decisions. Today, the US oil industry is much more sensitive and responsive to prices and the lag is a just few months, not a decade. Texas accounts for approximately 10% of the US economy and went into recession when oil prices collapsed in and since 2014. Oil prices around $70/bl or $80/bl can be tolerated by the US consumer and they are very positive for US economic activity.

Source: Maratheftis



3.5%
The global expansion has weakened, confirmed the IMF. Global growth for 2018 was estimated at 3.7% last October. It is now projected to grow at 3.5% in 2019 and 3.6% in 2020.

2030
By 2030, the US' oil production will not be at current levels. Comparatively, the UAE plans to increase its production from 3.5m b/d today to 5m b/d within the same time frame. Is it a case of the hare versus the tortoise?

10%
The US state of Texas, the beating heart of the country's black gold revolution, accounts for 10% of the country's economy.

Energy Transition
The Year of Acceptance?

H.E. Dr. Sun Xiansheng, Secretary General, International Energy Forum
H.E. Amb. Ernst Peter Fischer, Former Director for Energy & Climate Policy, Federal Foreign Office, Germany
Dr. Ahmed Attiga, Chief Executive Officer, Arab Petroleum Investment Corporation
Mohamed Jameel Al Ramahi, Chief Executive Officer, Masdar
Moderator: Sean Evers, Managing Partner, Gulf Intelligence

Sean Evers (SE): *The COP 24 Conference in Poland in December successfully put together a climate change package that aims to bring the Paris Agreement to life in 2019. Are we finally witnessing the energy transition directly changing the industry and economies as a whole? If so, how will this affect decision making?*

Mohamed Jameel Al Ramahi: Climate change is a reality and we need to act. COP and the Paris Agreement are ways towards this commitment and investment in renewable energy has now become mainstream. But we also must bear in mind that this is driven by economic growth and the forecasted global slow down, particularly for China, could potentially impact the targets of what is needed in the Paris Agreement. I am optimistic and companies, like Masdar and some fossil fuel firms at the global level, are demonstrating a commitment to de-carbonization and to the green economy.

SE: *Germany announced that it now generates 40% of its power from renewables. Will 2019 be a turning point given that the Paris Agreement has been greenlighted?*

H.E. Amb. Ernst Peter Fischer: The change moment came a few years back. The first year where new power production installation in renewables surpassed conventionals was 2017. But the conventional energy perspective doesn't yet match the reality of climate change, which is advancing faster and faster and is going to have an enormous impact on wealth and survival.

SE: *Is there any cynicism from industry that policy makers are not going to get the job done? Germany may have crossed the 40% mark in renewables, but 39% of power generation still comes from coal. Is there enough definitive action being taken?*

H.E. Amb. Ernst Peter Fischer: There is the driver of climate change on the one hand and there are realities, such as the levelized cost of electricity (LCOE) from renewables. These have come down, so investment is happening. But we are seeing another factor today that is negative for the energy transition and that is fragmentation in the political sphere; a 'me first' attitude towards economic policy and international relations. Multilateral approaches are less in favor and efforts on climate, security, trade and human rights are becoming less cohesive. Countries like China, Russia and the US are pursuing independent policies on technology and finance. The question is whether the energy transition will occur fast enough to prevent dangerous climate change. And that's really up to us.

SE: *One of the things that determines the speed of transition is money. Is there enough capital being made available?*

Dr. Ahmed Attiga: An energy transition takes time and it reflects economic reform. In this region, diversification is a key pillar of economic reform and the volume and nature of the funding that's needed in the energy sector are massive. But governments are facing fiscal shortages, so we have seen an increased role for the private sector, as well as a general rise in investments into power vis-à-vis conventional oil and gas. Within the power sector, renewables have the largest share.

Mohamed Jameel Al Ramahi: Initially, it was difficult to finance renewable energy projects as lenders were not generally comfortable with the technology. Today, things are different. As an example, Masdar just refinanced one of our wind farms in the UK for £1.3 billion ($1.7 billion). The project finance structure was much better than when we did it three years ago, as there is much more familiarity with this asset class. The region has realized that it is critical to follow the direction that the UAE has taken in renewables, for example. Thanks to advanced efficiencies in technologies, the sector is now commercially attractive on a standalone basis and does not even require subsidies.

Snapshot: COP24

30,000
The number of participants who attended COP24 in the southern city of Katowice in Poland last December.

196
Negotiators from 196 countries and the EU worked for two weeks on the Katowice Rulebook, which will spearhead the continued implementation of the Paris Agreement.

X3
Finance, transparency and adaptation are three cornerstones of the Katowice Rulebook.

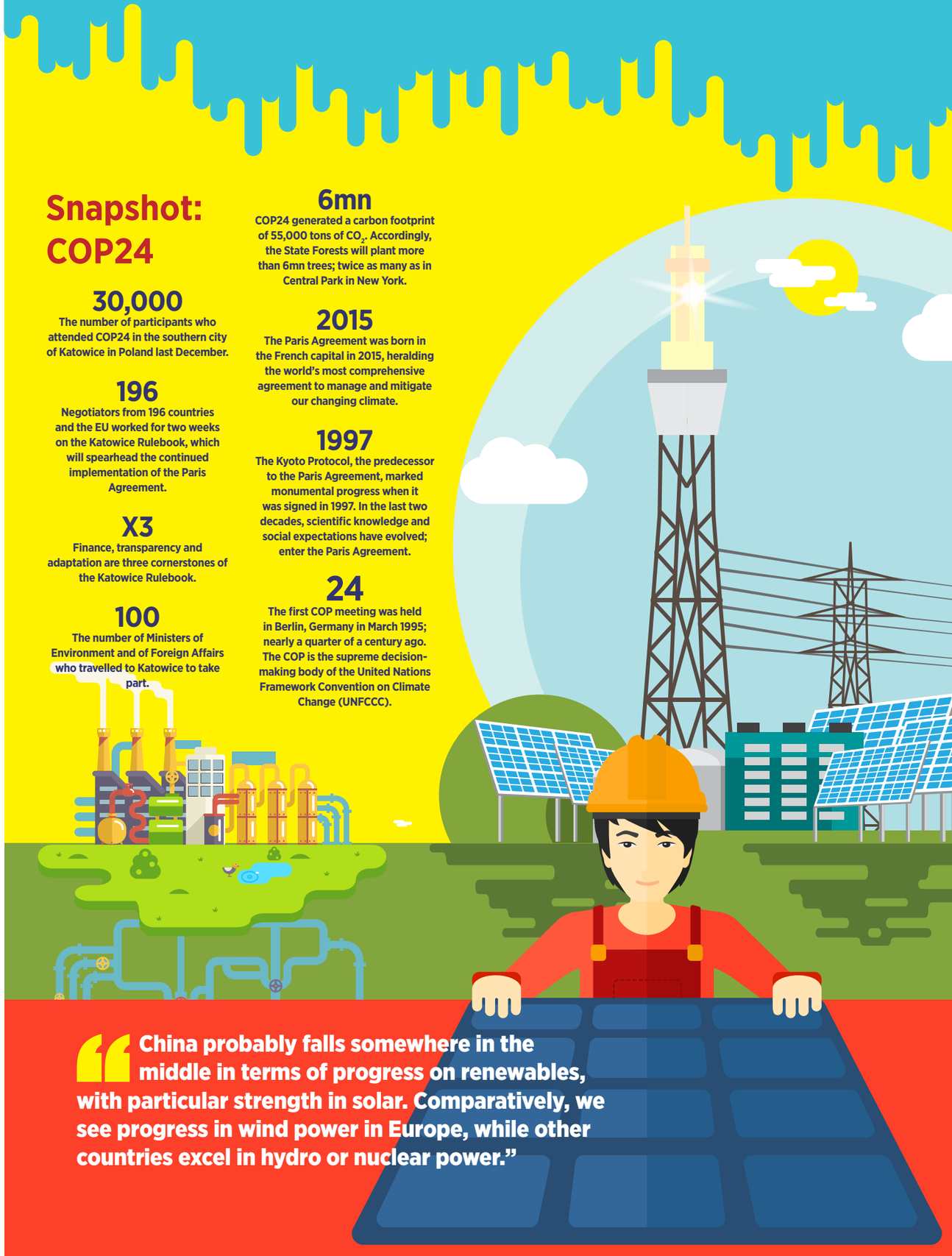
100
The number of Ministers of Environment and of Foreign Affairs who travelled to Katowice to take part.

6mn
COP24 generated a carbon footprint of 55,000 tons of CO_2. Accordingly, the State Forests will plant more than 6mn trees; twice as many as in Central Park in New York.

2015
The Paris Agreement was born in the French capital in 2015, heralding the world's most comprehensive agreement to manage and mitigate our changing climate.

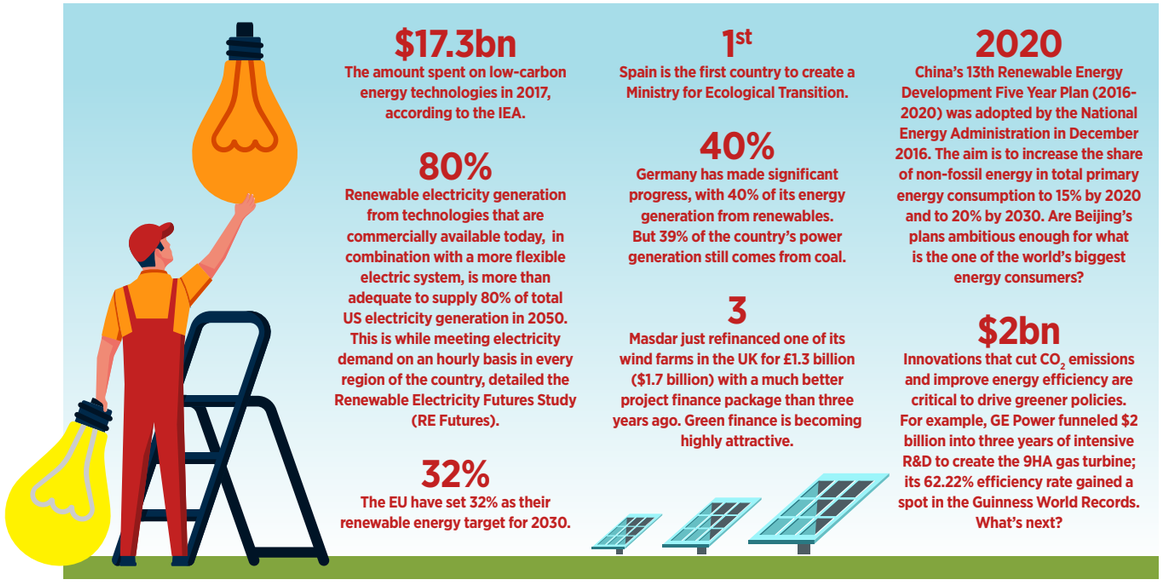
1997
The Kyoto Protocol, the predecessor to the Paris Agreement, marked monumental progress when it was signed in 1997. In the last two decades, scientific knowledge and social expectations have evolved; enter the Paris Agreement.

24
The first COP meeting was held in Berlin, Germany in March 1995; nearly a quarter of a century ago. The COP is the supreme decision-making body of the United Nations Framework Convention on Climate Change (UNFCCC).



"China probably falls somewhere in the middle in terms of progress on renewables, with particular strength in solar. Comparatively, we see progress in wind power in Europe, while other countries excel in hydro or nuclear power."

GLOBAL JIGSAW OF ENERGY SECURITY: FIND THE MISSING PIECES!



"The onus is on policy makers – but it's not easy."

SE: Does it matter that President Trump plans to abandon the Paris Agreement? The US is reducing its carbon emissions output despite that, as the economics seem too attractive to ignore.

H.E. Amb. Ernst Peter Fischer: Policy is important, but the main driver is the market and that includes the US. We need a global effort to combat climate change and the US is still the world's leading economy.

SE: The US also didn't ratify the Kyoto Protocol (est.1997) and yet it was one of the few countries that complied with the Kyoto Protocol's targets. It seems the power of the US economy is such that whatever the government policy, the economics are so strong that commerce will turn it around. What is China's full commitment to the energy transition?

H.E. Dr. Sun Xiansheng: China is very serious about this issue. Domestically, it is taking strong action on pollution, but climate change is universal. Countries need to commit together, especially the larger and more powerful countries, like the US. On a global scale, China probably falls somewhere in the middle in terms of progress on renewables, with particular strength in solar. Comparatively, we see progress in wind power in Europe, while other countries excel in hydro or nuclear power.

SE: Does the US' non-compliance with the Paris Agreement remove the security of financing for others and weaken momentum towards the energy transition?

Dr. Ahmed Attiga: The proposed withdrawal of the US from the Paris Agreement does matter. Without the US, implementing a global governance for climate change will not be meaningful and it also disrupts the governance framework that the world has agreed upon. I hope it doesn't materialize. As far as financiers are concerned, I don't see any negative impact in the short term. But generally, the regulatory framework that ought to be in place for climate change investments to be bankable and to flourish requires a global consensus that is reflected in each country's implementation.

SE: Do we all win if certain countries invest in low carbon, albeit at different rates? Or is this an economic race of whoever gets there first wins?

H. E. Amb. Ernst Peter Fischer: The influence of a country will be determined to a large degree by how well it manages the transition to a low carbon economy. The losers will be those who don't participate at all.

SE: What's the most appropriate indicator to measure a country's progress in implementing an energy transition strategy? Is it removing subsidies on fossil fuels, investing in projects or the local supply chain, achieving public buy in or industry buy in?

Dr. Ahmed Attiga: All are important, but in this region, there must be a consistent and well-articulated communications campaign to get public buy in. This element is not always covered sufficiently.

SE: Are policy makers accelerating the shift to clean energy solutions fast enough?

H. E. Amb. Ernst Peter Fischer: Ultimately, the onus is on policy makers, but it's not easy. There are social and employment implications with inevitable fallout, such as certain jobs and industries becoming redundant as we are experiencing in the EU and certainly in Germany. Still, the long-term benefits are clear. We must focus on that. ■

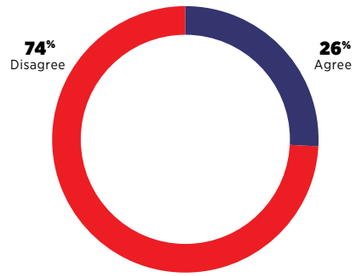
**Edited transcript*

GIQ

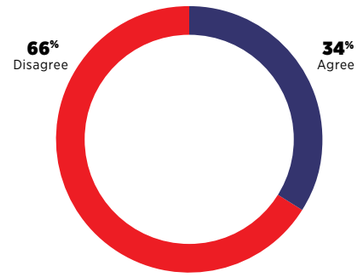
INDUSTRY SURVEY RESULTS

Ramping Up Green Credentials: What's Next?

The COP24 conference in Poland in late 2018 successfully put together a climate change package. This will be the year when the big energy transition invigorates on-the-ground action that changes industry and economies.



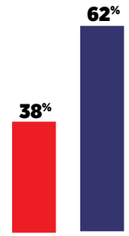
Global CO_2 emissions rose in Asia and Europe in 2017; regions with strong support for the Paris Agreement. Yet, they declined in the US, which suggests it doesn't really matter that US President Trump withdrew the country from the agreement.



China is at the forefront of the global transformation into a lower carbon energy world. Beijing has spent $60 billion on subsidizing its electric car industry over the last decade and it is deploying a similar commitment to hydrogen fuel cell vehicles. With such financial momentum, is it possible to get left behind in the great energy transition and miss out on its economic rewards, now estimated at $1 trillion per year?

A. Yes, first movers set the agenda and own the most valuable intellectual property (IP).

B. No, we all win when countries invest in lower carbon solutions.



Which of the following is the most appropriate indicator to measure a country's progress in implementing an energy transition strategy?

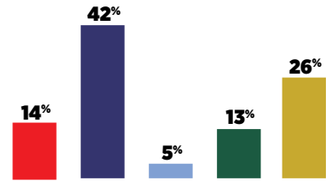
A. Removing subsidies on fossil fuels

B. Amount invested in renewable energy projects

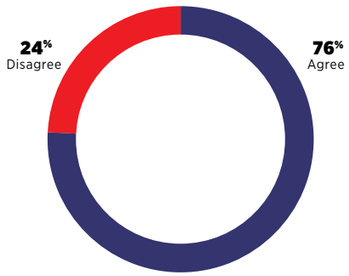
C. Competence of local supply chain to deliver

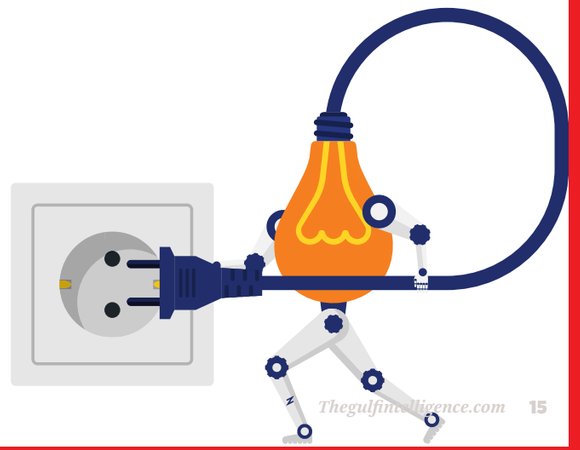
D. Public buy in to transition commitment

E. Industry buy in to transition commitment



The World Economic Forum (WEF) said the global energy transition is not moving fast enough. The WEF declared that the ball was back in policymakers' court to accelerate the shift to the clean energy solutions of the future.





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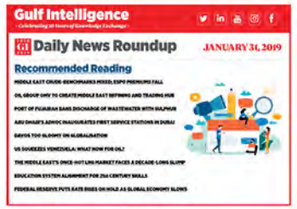

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KICK OFF 2020

Countdown to the US' Presidential Election

Dr. Frank Luntz, Political Consultant & Pollster
Prof. Sophia Kalantzakos, Global Distinguished Professor of Environmental Studies and Public Policy, NYU Abu Dhabi

Dr. Frank Luntz: The Democrats do not have their act together. I don't think the new speaker of the House, Nancy Pelosi, is a good communicator. She's an outstanding fundraiser and galvanizer of the left of her party, but not the new and alternative face that the Democrats need. They are not putting out the right messaging to defeat President Trump.

Prof. Sophia Kalantzakos: The shift in the House in the recent mid-terms is not so much about the Democrats winning, but about other voices entering the conversation and changing the landscape. For example, the advent of younger members.

Dr. Frank Luntz: That is not filtering through to voter turnout unfortunately. In the 2008 election, people in the age bracket of 18-29 represented 18% of the vote. In 2012 at former President Obama's re-election, they represented 19%. In 2018, they represented a total of 12% of the vote, despite it being the highest registered voter turnout overall in a century. There was a lot of criticism of politics during that campaign by voters, but everyone came out – except for the younger generation. This is where I criticize the media who touted that 2018 was going to be 'the year of the young generation' and 'the year of the woman', for example. They were projecting that women would be 55% of the electorate (they typically make up between 52-54%), but it was actually 51-52% That's lower than it has been in the past.

At the mid-terms last November, 39% of the people who voted wanted President Trump impeached.

100
In 2018, younger voters represented a total of 12% of the vote, despite it being the highest registered voter turnout overall in 100 years. The verdict? Young minds are clearly not engaged!

> **"The 2020 campaign will be the ugliest we've ever had in modern times; perhaps the worst campaign in America since 1824."**

That is over 70% of Democrats, about 40% of Independents and no Republicans. The highest it ever was for President Clinton in the 1990s was 41% and that was right after he had acknowledged a wrongdoing and apologized. The view on President Trump being impeached is almost at that level right now, and that's before the Democrats start subpoenaing people. However, it has not been a hindrance for the White House or for the agencies yet, because President Trump completely dismisses it. That may change in March when they start to do congressional hearings and subpoenas, but there's no impact on the White House for now.

President Trump could lose the impeachment vote. The Democrats are hostile to him and I know very few who would be willing to stand up to their party and constituents and affirm him. But it will not be a vote on whether or not he committed high crimes and misdemeanors. It's going to be a case of 'do I affirm or reject President Trump?' It is so partisan in the House that in certain circumstances, he would lose that vote. But there is no way he will lose it in the Senate.

Prof. Sophia Kalantzakos: If the Senate does not vote for a conviction, even if he is impeached, there will be no real consequence. This is exactly what happened to President Clinton in 1998. Does it seem at all plausible that President Trump will be leaving the White House before the end of the term if not convicted? If not, it might be a wasteful tactic for the Democrats to keep focusing all their ammunition on that instead of producing new policy initiatives.

Dr. Frank Luntz: President Trump is the most popular president among his political party of any president since President Roosevelt in the early 1900s. He owns the Republican party. They have completely changed their position on immigration, on trade and on some other issues. The Republicans who don't like where the party is headed have left. This is not 1968 and President Johnson where you had Eugene McCarthy challenging him. This is not 1980 with Ted Kennedy who unsuccessfully challenged President Carter. However, the opposition to President Trump is also stronger today than it was two years ago. The 2020 campaign will be the ugliest we've ever had in modern times; perhaps the worst campaign in America since 1824.

Prof. Sophia Kalantzakos: Who looks likely to be the Democratic nominee? Joe Biden? Michael Bloomberg? Elizabeth Warren? Kamala Harris?

Dr. Frank Luntz: I believe there will be 18 Democrats running, which would be the most in the history of American politics. That will be quite a challenge when it comes to the debates as there won't be time for valuable dialogue. Whoever it is, they will need to be very well prepared to face Iowa and New Hampshire voters, who are extremely tough and intelligent constituencies. ■

**Edited transcript*

52%
US media said women would account for more of the electorate than in recent elections. Yet, it was 51%-52% - lower than previous years. An accurate narrative in the media is critical.

39%
More than a third (39%) of voters wanted President Trump impeached at the mid-terms last November.

1900s
President Trump is the most popular president since President Roosevelt in the early 1900s. The 32nd President of the US held office between 1933 and 1945.

A Rare Meeting of Ideals?

Americans want energy independence. It's the one place where the parties meet. There's a big move now for legislation to take us from E15 to E85; it would remove the US' dependence on Middle Eastern oil. Climate change is a zero issue among Republicans. When asked the question on mid-term election night, no Republicans had climate change as one of their top two issues. Among Democrats, the number one issue is income equality followed by climate change and then the civility of politics. We must find a way to avoid arguing over the definition of climate change and rather argue the solutions to it. We must go around the Republicans, because we are not going to change them, and instead focus on ways to make the air cleaner, our water safer and create great jobs for the economy. Climate change activists also need to adjust their attitude and stop fighting over absolute definitions. Be pragmatic and you win. Be highly logical and you lose.

Source: Dr. Luntz

★★★ Top 3 Issues ★★★ to Watch in 2019

Developments on the border wall with Mexico

The result of efforts to impeach President Trump

Finding electable candidates to signify the change that the Democrats want to project

Source: Prof. Kalantzakos

Hit the Digital Accelerator – *Now*

By Georg Harwalik, Head of Exploration, Development & Production MEA, OMV

Is this the year the energy industry finally embraces the 4th Industrial Revolution, the world's biggest economic shift since the 1800s? Yes – and it's about time. We all already use technologies and digital tools, just as we all drive cars. But driving a car that is not widely used at 100km/hr in unknown territory is a different scenario to driving straight with good visibility at 30km/hr i.e. disruptive versus mainstream technologies.

Untapped Gold Dust

What is one of the main justifications to push the boundaries? Economic gold dust. Digitalization could unlock up to $2.5 trillion of industry and societal value in the global oil and gas markets in the medium-term. Benefits include reduced emissions and $170 billion in cost savings for customers, according to the World Economic Forum (WEF). Giving such opportunities a cold shoulder will dull your competitive edge, especially in a world of $60s/bl oil.

$2.5trn
Digitalization could unlock up to $2.5 trillion of industry and societal value in the global oil and gas markets in the medium-term.

$170bn
The benefits of embracing digitalization include reduced emissions and $170 billion in cost savings for customers.

Eight billion devices are now connected to the internet, rising to 1 trillion by 2030, the WEF said. Smart Internet of Things (IoT) technologies will witness $933.6 billion of investments by 2025, according to Grand View Research, while the International Data Corporation (IDC) expects corporate spending on new technologies to grow by 13% compound annual growth rate (CAGR) to $2.4 trillion between 2016 and 2020. GE said predictive analytics are saving companies $7 million on gas pipelines in the eastern US by forecasting failures, and $325,000 per rig by using machine learning to predict drill-bit locations. Is this a savings plan and growth trajectory that you are happy to miss out on?

> **"If we train our algorithms with lousy knowledge, they will make lousy decisions."**

The industry's sometimes tentative digital adoption is understandable. But real-time transparency is coveted, both in-house and in partnerships. Proper data management (PDM) is the best route to such transparency, therefore mitigating risk, bolstering confidence and smoothing the way for much-needed investors. It is a simple equation: if we train our algorithms with lousy knowledge, they will make lousy decisions. Inevitably, black spots of inaccuracies will start to appear.

Navigating Speed Bumps

Such black spots in an industry synonymous with high-risk environments and big-ticket checks are far from ideal. One way to counter this guesswork is by appointing 'digital sheriffs'; experts who can leverage their digital acumen to protect against the world's newest and largely invisible mafia: cyberhackers. Cybercrime cost the world almost $600 billion, or 0.8% of global GDP in 2017, estimated McAfee.

But – and this is a meaningful but – such threats must not detract from the limitless opportunities offered by digitalization. It is better to accept and manage the risk and embrace the revolution, than shy away and risk financial ruin in the 2020s and beyond. Have no doubt that your competitors will be sharpening their digital edge to increase efficiency, cut costs and hit increasingly demanding environmental targets. Learning how to manage your concerns is critical to progressing swiftly and smartly.

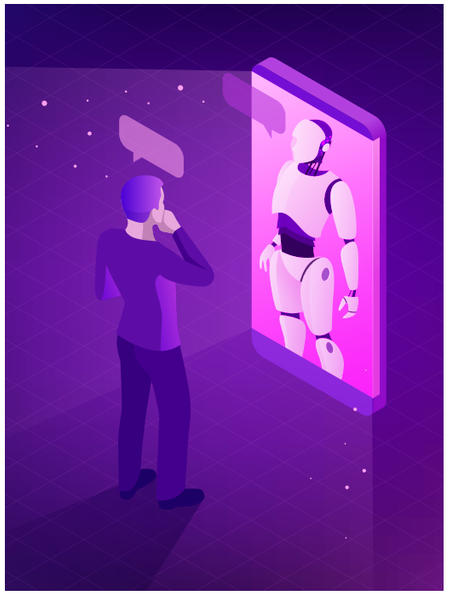
$600bn
Digitalization must be embraced, but smartly. Cybercrime cost the world $600 billion of global GDP in 2017 – larger than some countries' economies.

8bn
The number of devices now connected to the internet, which is expected to rise to 1 trillion by 2030.

2025
There will be up to $933.6 billion of investments in Smart Internet of Things (IoT) technologies by 2025.

$7mn
Predictive analytics are saving companies $7 million on gas pipelines in the eastern US by forecasting failures, and $325,000 per rig by using machine learning to predict drill-bit locations.

2023
The IEA expects the Middle East to have the world's biggest growth in refining capacity up to 2023. What role can digitalization play in fine-tuning processes to enhance efficiencies and drive growth?



Technology companies will increasingly become in-house entities in national oil companies (NOCs) and international oil companies (IOCs) in the Middle East this year to finesse digital portfolios. But this means mastering a tricky balancing act: protecting intellectual property (IP) while removing bricks in the walls blocking knowledge and data exchange.

Thriving in the 2020s means enhancing your digital education, managing your fear of change and promoting visibility. When it comes to outlining your strategy, ask yourself one question: which car would you rather be in? ■

Recapturing Hearts, Inspiring Minds

Many budding oil and gas specialists walked out of their classrooms following the price volatility of 2014 and the subsequent ramp up in lower-carbon growth, leaving a talent shortage. How do we recapture their interest in fossil fuels, a major and vital slice of the energy pie up to 2050 at least? And how do we facilitate their digital education? The pool of petroleum engineers today will increasingly evolve into one of data scientists over the coming decades. Does the oil and gas market know how that shift is going to pan out? Probably not. We must all work harder to find answers. A blasé attitude will drive failures.

Digital transformation is a business transformation; one cannot thrive without the positive disruption of the other. Scalability of cultural change is one of the factors that needs addressing in this context. Communicating a new culture that embraces productive failure i.e. innovative research and development (R&D), in a small and medium-sized enterprise (SME) is one task. Spreading the message in a NOC of 100,000 people is another, let alone in the ethos of a major and long-running partnership. In-house and cross-sector education will be a vital bridge for those stepping into the digital world. They need guidance to ensure they do not anchor the learning speed of others. Ignoring their naivety will lead to costly mistakes.

Middle East Must up its LNG Credentials

By Laurent Chevalier, Vice President Middle East, Gas, Renewables & Power, TOTAL

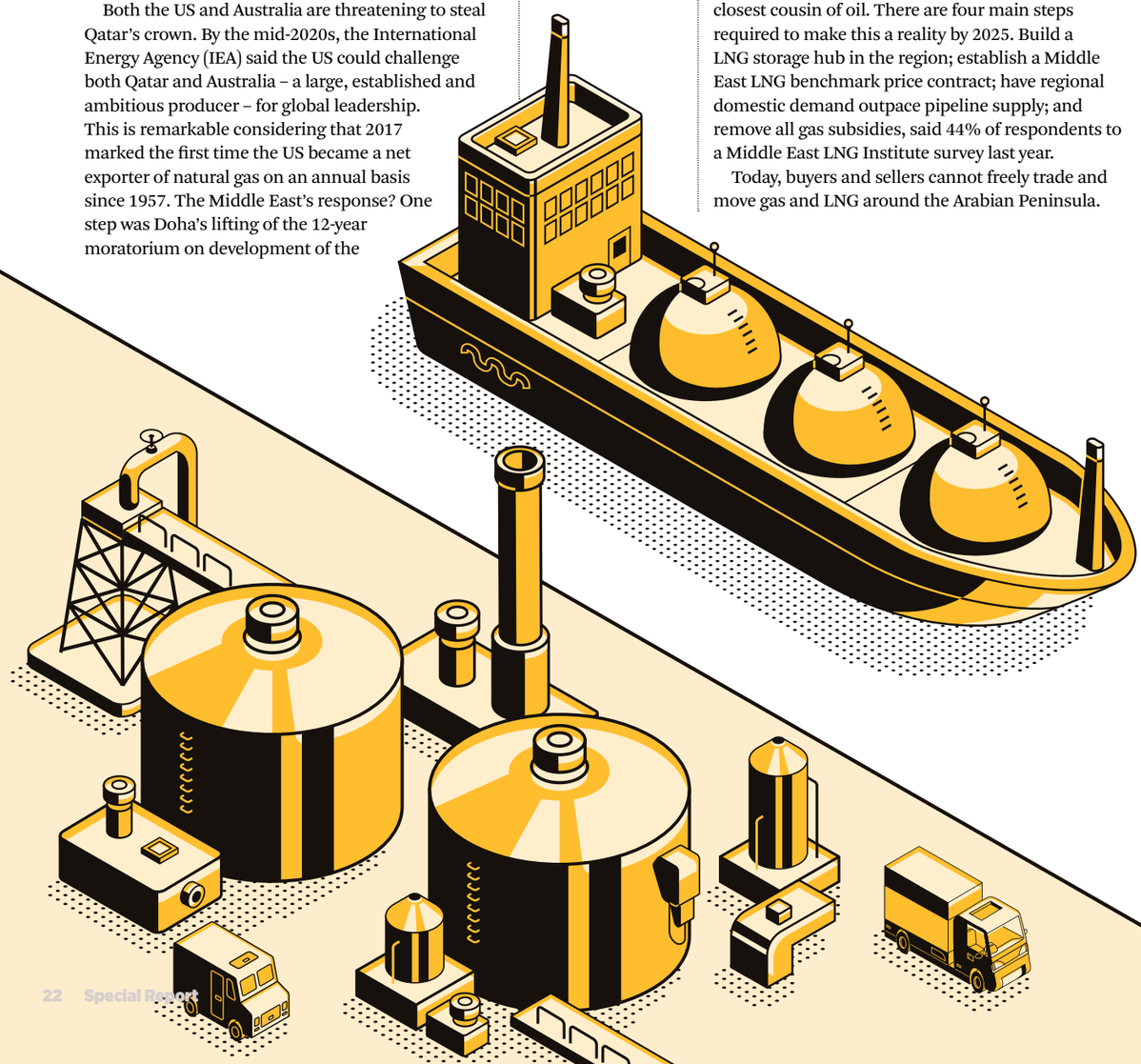
LNG is a bullish story that the Middle East cannot afford to be written out of. Home to the world's biggest LNG exporter, Qatar, the region must work harder than ever to remain front and center in one of the fastest growing energy commodities.

Both the US and Australia are threatening to steal Qatar's crown. By the mid-2020s, the International Energy Agency (IEA) said the US could challenge both Qatar and Australia – a large, established and ambitious producer – for global leadership. This is remarkable considering that 2017 marked the first time the US became a net exporter of natural gas on an annual basis since 1957. The Middle East's response? One step was Doha's lifting of the 12-year moratorium on development of the North Field in 2017, which it shares with Iran. New developments could add 400,000 b/d of oil equivalent to Qatar's output.

39
The number of LNG consuming countries worldwide has more than doubled from 15 in 2005 to 39 in 2017.

There are also plans to establish a liquid, flexible and transparent Middle East LNG market as Gulf countries – bar Qatar – rev up their interest in the closest cousin of oil. There are four main steps required to make this a reality by 2025. Build a LNG storage hub in the region; establish a Middle East LNG benchmark price contract; have regional domestic demand outpace pipeline supply; and remove all gas subsidies, said 44% of respondents to a Middle East LNG Institute survey last year.

Today, buyers and sellers cannot freely trade and move gas and LNG around the Arabian Peninsula.



The land mass may as well constitute islands for the level of connectivity in play. United gas infrastructure is essential to meet rising demand and deepen the region's position as an energy superpower. Addressing disjointed policies is critical for Middle Eastern countries to ensure the market's architecture can facilitate demand profiles. Un-optimized LNG imports and a limping export market are likely the alternative.

Reading the Tea Leaves

On the demand side, Asia continued to dominate LNG import demand in the first half of 2018, with overall volumes increasing at least 12% year-on-year, according to McKinsey&Company. In China alone, LNG import volumes grew by 52% per annum during the first half of last year. The Middle East must ensure it remains deeply embedded in the pack of preferred exporters. China is expected to surpass Japan to become the world's biggest importer of LNG in the next decade. Every two days in 2018, one more LNG vessel arrived at China's shoreline than in 2017. This increase may slow slightly in 2019. But any slowdown will be short lived amid China's emphasis on developing terminal infrastructure and expanding storage. What does this mean? Gargantuan potential awaits, including for the Middle East's established and emerging LNG exporters.

Opinions are mixed over whether China can – and should – become an LNG pricing hub. China ticks the box for diversified sources of gas (domestic, pipeline, LNG), growing liquidity and Shanghai is keen to position itself as a hub; a bid backed by an established financial environment. But questions over the transparency of operations are hard to ignore and it remains to be seen whether Japan, still a major LNG importer, would embrace Shanghai as a price master.

> **"The Middle East's goal? To ensure it remains deeply embedded in the pack of preferred exporters."**

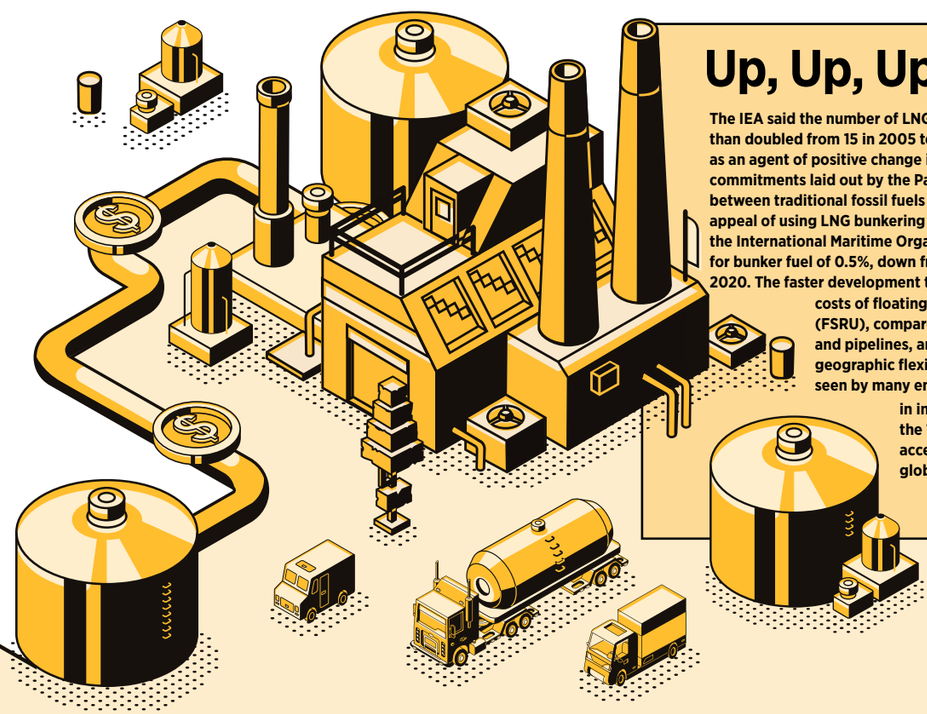
12
The number of years that Qatar had a moratorium on development of the North Field. Doha lifted the restriction in 2017, largely in response to intensifying competition in the LNG export market and rising domestic demand.

#1
Will the US steal Qatar's crown and nudge Australia out of the way – currently the world's largest LNG exporters, respectively – to become the world's biggest LNG exporter by the mid-2020s? It looks increasingly viable.

X2
Every two days in 2018, one more LNG vessel arrived at China's shoreline than in 2017.

In terms of contracts, bidding au revoir to the historical dominance of long-term deals in the LNG market is premature. Yes, these bread-and-butter deals are easing amid rising appetite for shorter-term contracts and spot deals, especially in the last two years. The average length of a LNG supply contract was approximately 21 years in 1994 – it fell to six years in 2017. A surge in Chinese winter demand in 2017 was almost entirely satisfied via the spot market, for example. But it has not been the dominating wave of change that some anticipated. Many stakeholders still want the security of long-term contracts, particularly those seeking funding for independent power projects (IPP) that stretch into the decades.

The ability of Middle Eastern stakeholders to suit customers' new demands while reassuring their traditional financiers that big-ticket investments are safe will be pivotal to the region's prominence on the global LNG stage. It won't be easy. But Qatar's track record offers a robust template for further growth. And Abu Dhabi showed the way in deciding to extend the life of its legacy LNG plant on Das Island to 2040 and beyond. All will be well if stakeholders give LNG even half the attention that has historically been allocated to black gold. ■



Up, Up, Up...

The IEA said the number of LNG consuming countries has more than doubled from 15 in 2005 to 39 in 2017. LNG is viewed as an agent of positive change in meeting the low-carbon commitments laid out by the Paris Agreement; a mid-way point between traditional fossil fuels and renewables. Therein lies the appeal of using LNG bunkering as one compliance option for the International Maritime Organization's (IMO) new sulfur limit for bunker fuel of 0.5%, down from 3.5%, from the 1 January 2020. The faster development timeline and lower initial capital costs of floating storage and regasification units (FSRU), compared to onshore regasification and pipelines, are also propelling growth. The geographic flexibility offered by FSRUs is also seen by many energy leaders as a gamechanger in improving the energy fortunes of the 1.1 billion people who don't have access to electricity – 14% of the global population.

Dodge the Swinging Pendulum

By Michelle Meineke, Editor, Gulf Intelligence

If China and the US cough, other countries can catch the flu; so significant is the economic ripple effect of these two behemoths. Trade tariffs and diverging policies towards North Korea are among a growing list of issues that will likely drive discord this year. Energy stakeholders cannot afford to ignore the yo-yo of cooperation and frustration between these two titans.

China is the world's biggest buyer of oil, surpassing the US in annual gross crude oil imports in 2017 with 8.4m b/d compared to the US' 7.9m b/d. Last December, preliminary data from China's General Administration of Customs showed that China's crude oil imports rose 15.7% year-on-year to a record high of 10.48m b/d in November. Plus, the Asian Development Bank expects energy demand to almost double in the Asia and Pacific region by 2030; music to Middle Eastern energy exporters' ears.

> **"How to plot a safe path through this year's geopolitical wilderness? Shun isolationists and make more friends."**

To the west, the boomerang nature of the US' energy industry suggests more surprises await in the 2020s. The US has been a net energy importer since 1953, but the continued growth in petroleum and natural gas production means the country will be a net energy exporter by 2020, according to the US' Energy Information Administration (EIA). This is an astonishing turnaround, especially considering UN data shows that the country's population more than doubled from 158 million in 1950 to 324 million in 2017. Take the LNG market alone: having become a net natural gas exporter on an annual basis in 2017, the US could be the world's largest exporter by the mid-2020s.

When it comes to economic growth, China takes the crown. Beijing will manage the world's largest GDP by 2050, while the US' position on the global scoreboard slips one spot to third place, detailed PwC. Yes, China is experiencing its lowest growth rate since 1990 and some justifiably anticipate another deceleration post-2020, towards 5% annual growth. But perspective is vital; President Trump would be delighted if the US steadily posted 5% annual growth. For now, the International Monetary Fund (IMF) expects China's GDP growth this year to be 6.2% versus the US' growth of 2.5%.

90
Punches in the trade war between China and the US were suspended in a 90-day ceasefire. Is this the end of the boxing match?

2050
China will be the top dog in terms of GDP size by 2050. India and the US come in second and third, respectively.

2022
Friends with deep pockets are vital. Meeting electricity demand alone in MENA by 2022 comes with a $260 billion price tag.

$8trn
Allies in China are especially coveted; investments under Beijing's One Belt, One Road initiative range from $1 trillion to $8 trillion.

2024
The US' population more than doubled from 158 million in 1950 to 324 million in 2017. Comparatively, China will be home to 1.44 billion people by 2024. Opportunity or hindrance?

2020s
The US is on track to embed its role as the world's biggest oil and LNG exporter on the global energy stage in the 2020s. Underestimate the country's might at your economic peril; more surprises await.

Simmering tensions between the two will undoubtedly persist. Beijing tends to act without much political fanfare, while President Trump is more vocal but often has less of a bite. Still, the consensus among Middle Eastern energy stakeholders is that codependence will prevail over strategic mistrust – for now. Making more friends is the Middle East's best hedging tool. With some strategic quid pro quo, a worst-case scenario can see the region grappling with a cold while isolationists battle the flu. ■

Make Friends

How can Middle Eastern energy stakeholders plot a safe path through this year's geopolitical wilderness to remain competitive and have energy security? Ignore isolationists and make more friends. Middle Eastern countries are relatively small; the entire economy of the GCC roughly equates to that of India. While it's important to be friends with the US, it's no longer enough. Alliances with China, India, wider Asia, Europe and the fastest-growing hubs in Africa are also critical.

For example, the Middle East must attract investments from China's One Belt, One Road initiative (OBOR), as well as India's Think West policy. Popular estimates for Chinese investment under the OBOR initiative range from $1 trillion to $8 trillion, according to the Center for Strategic and International Studies. Comparatively, the Marshall Plan after World War II provided the equivalent of $800 billion in reconstruction funds to Europe. Meanwhile, India's efforts to integrate itself deeper into geopolitical dimensions, economies and transnational networks are gaining traction. The country's $2 trillion economy recently overtook France to become the world's sixth largest economy, according to Acuité Ratings and Research. PwC expects India's GDP growth to overtake the US by 2050, securing the number two spot behind China.

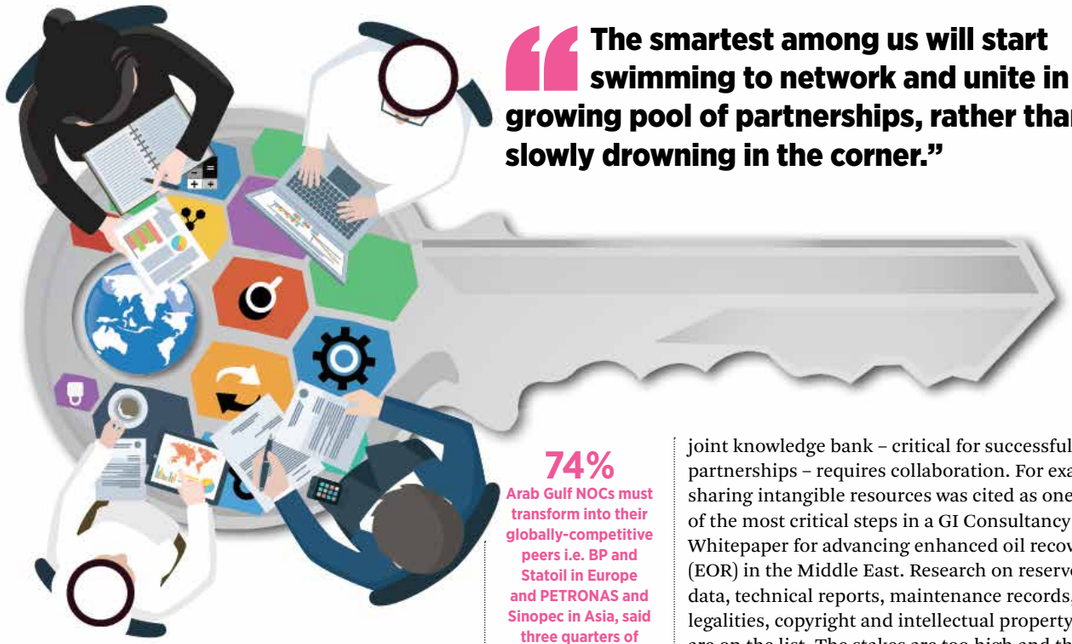
Clearly, nurturing friendships in such high places – the world's fastest growing economies and biggest energy consumers – can support the Middle East's coffers while minimizing the bruises caused by the sharp elbows of geopolitics. Saudi Arabia-based Apicorp said the Middle East and North Africa (MENA) must invest $260 billion in its power sector alone to meet rising electricity demand in 2018-2022. This is just one example of where friends with deep pockets and a reliance on imports can help the Middle East scale its cliff of energy demand.

Work Together, Thrive Together

By Dyala Sabbagh, Partner and COO, Gulf Intelligence

Ignore the importance of these four ingredients in energy partnerships at your own risk: resilience, transparency, sustainability and diversity. All will prove vital aids in navigating the positive disruption of the energy industry this year. Notable agents of change are $60s/bl oil, unpredictable geopolitics, rapidly rising energy demand, the energy transition towards lower-carbon growth and concerns over global economic growth.

"Partnerships that were a simple 'marriage' of corporate ideals between two companies have become more diverse."



> **"The smartest among us will start swimming to network and unite in this growing pool of partnerships, rather than slowly drowning in the corner."**

Silver linings have emerged from this oft dark cloud of unknowns. Partnerships that were a seemingly simple 'marriage' of corporate ideals between two companies have become more diverse. Thanks to the aforementioned drivers, the pool of players has widened with more renewable and technology companies entering a mix that historically focused on fossil-fuels. The smartest among us will start swimming to network and unite in this growing pool of partnerships, rather than slowly drowning in the corner.

For example, there will be a rise of international national oil companies (INOCs) – state-owned entities with appetite to broaden their geographic footprint. A large majority (74%) of survey respondents to a GIQ Industry Survey last year said Arab Gulf national oil companies (NOCs) must transform into globally-competitive peers i.e. BP and Statoil in Europe and PETRONAS and Sinopec in Asia. And, against the backdrop of the 4th Industrial Revolution, a quarter of survey respondents said partnerships between NOCs and Silicon Valley companies will become increasingly dominant in the 2020s.

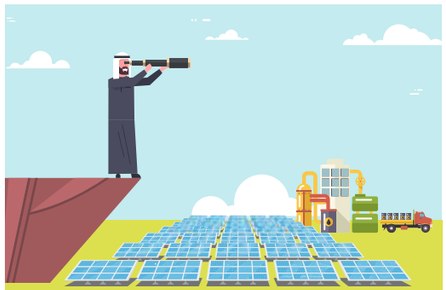
Diversity is feeding creativity, which reflects the ongoing maturation of the Middle East's financial savviness. The terms of deals are broadening. A simple exchange of cash and assets is increasingly being edited to focus more heavily on a mix of tangible and intangible goods, especially when it comes to digital acumen and talent enhancement. Every brick that goes towards building a joint knowledge bank – critical for successful partnerships – requires collaboration. For example, sharing intangible resources was cited as one of the most critical steps in a GI Consultancy Whitepaper for advancing enhanced oil recovery (EOR) in the Middle East. Research on reservoir data, technical reports, maintenance records, legalities, copyright and intellectual property (IP) are on the list. The stakes are too high and the demands too serious for isolationist ideas; energy security is the holy grail for all. ■

74%
Arab Gulf NOCs must transform into their globally-competitive peers i.e. BP and Statoil in Europe and PETRONAS and Sinopec in Asia, said three quarters of GIQ Industry Survey respondents.

1st
The first solar powered lubricants blending plant in the UAE was opened by ENOC last year, providing an affordable and logistically-viable template for others to follow suit.

55%
This increase in the Middle East's energy consumption by 2040, as forecast by BP Outlook, requires more alliances. The Middle East cannot do it alone.

65%
This percentage of children entering primary school today will ultimately end up working in completely new job types that don't yet exist, according to a popular estimate cited by the World Economic Forum (WEF).



Holism works

NOCs' partnerships must continue incorporating lower-carbon elements, even as they increase their oil and gas portfolios to meet rising demand. Middle Eastern NOCs, supported by governments' forward-thinking National Visions, are gradually mastering this balance. For example, Emirates National Oil Company (ENOC) converted its Lubricants and Grease Manufacturing plant (DLPP) in Jebel Ali to fully operate on solar energy last October – the first solar powered lubricants blending plant in the UAE.

Some energy stakeholders believe oil and gas companies should leave low-carbon trailblazing to the experts in the green sector. They argue that renewables are a completely different business with different capabilities and different targets. That is correct, but only to a point. Yes, the lower-carbon market – renewables, energy efficiency, electrification, for example – is a different side of the energy coin to fossil fuels. But surely a greater awareness within the fossil fuel industry of how the 'other side' of the coin works can only improve integration and funding requirements?