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YEAR AHEAD – ENERGY OUTLOOK

Whitepaper

Q1 – 2022

How can the Oil & Gas Industry Earn its Seat at the Climate Solution Table while Sustaining its Market Share in Net Zero Era?

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The 12th UAE Energy Forum 2022 – In Numbers

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Oil: What to Expect in 2022?

Sean Evers, Managing Partner, Gulf Intelligence

Sustained demand recovery and dwindling spare capacity will ensure firm floorboards under the oil price in 2022.

The average annual price of Brent crude oil in 2021 was $71/bl – the highest in three years. This represented a dramatic recovery after a $40/bl average in 2020, when a historic collapse in demand during the Covid-19 pandemic resulted in an existential threat to oil producing countries. Crude oil prices soared in 2021 as rising Covid-19 vaccination rates, loosening pandemic-related restrictions, and a growing economy resulted in global oil demand rising faster than supply. The spot price of Brent crude oil, a global benchmark, started the year at $50/bl before rising to a high of $86/bl in late October. It declined in the final weeks of the year.

What's next?

However unique recent circumstances have been, last year still marked the seventh consecutive year when the average price of Brent crude changed by big double-digit percentages. Indeed, in only four years in the last twenty have we seen a single digit change to the average annual price; the only consistency in oil over the last two decades has been big swing volatility. The good news is that 2022 – all things being equal with no black swans – will most likely be one of those leap years when we witness only a single digit change in prices.

"The only consistency in oil over the last two decades has been big swing volatility. The good news is that 2022 – all things being equal with no black swans – will most likely be one of those leap years when we witness only a single digit change in prices."

There are many reasons to expect that oil prices will hold onto their 2021 gains. As every month goes by, more fundamental supply and demand floorboards are nailed-in under this very successfully managed market recovery. Inventories are below five-year averages and falling, global demand is returning towards the 2019 level of 100mn b/d, and the 2020 collapse in Capex for new supply is recovering to approximately $350bn. Plus, US shale oil is warming up on the sidelines as reluctant bankers study balance sheets and the FED is tightening – we all know how hard it is to hold onto New Year's resolutions.

Two pillars for 2022

Ultimately, there are two main pillars to build your 2022 worst-case scenario house on a $65-$70/bl Brent average. Firstly, OPEC+ countries have expended a massive amount of political capital and economic muscle to lift the oil price back up into the zone of balanced budgets. Now, they are going to keep both their feet on the proverbial gas to ensure their hard-won gains stick around for a while to allow their economies and societies to stabilize. The biggest surprise of 2021 must be how this disparate group of oil producers achieved unprecedented discipline in controlling supply – making many shorts ouch like hell!

Secondly, only five of the 23 countries within OPEC+ have been awarded increased production quotas from May 2022. By the time we get to mid-2022, the number of countries that can actually pump more oil at short notice will be reduced to probably just two or three Gulf states. Each month the oil-producing group increases their official production ceiling by 400,000 b/d marks another month closer to the world running short on available spare capacity.

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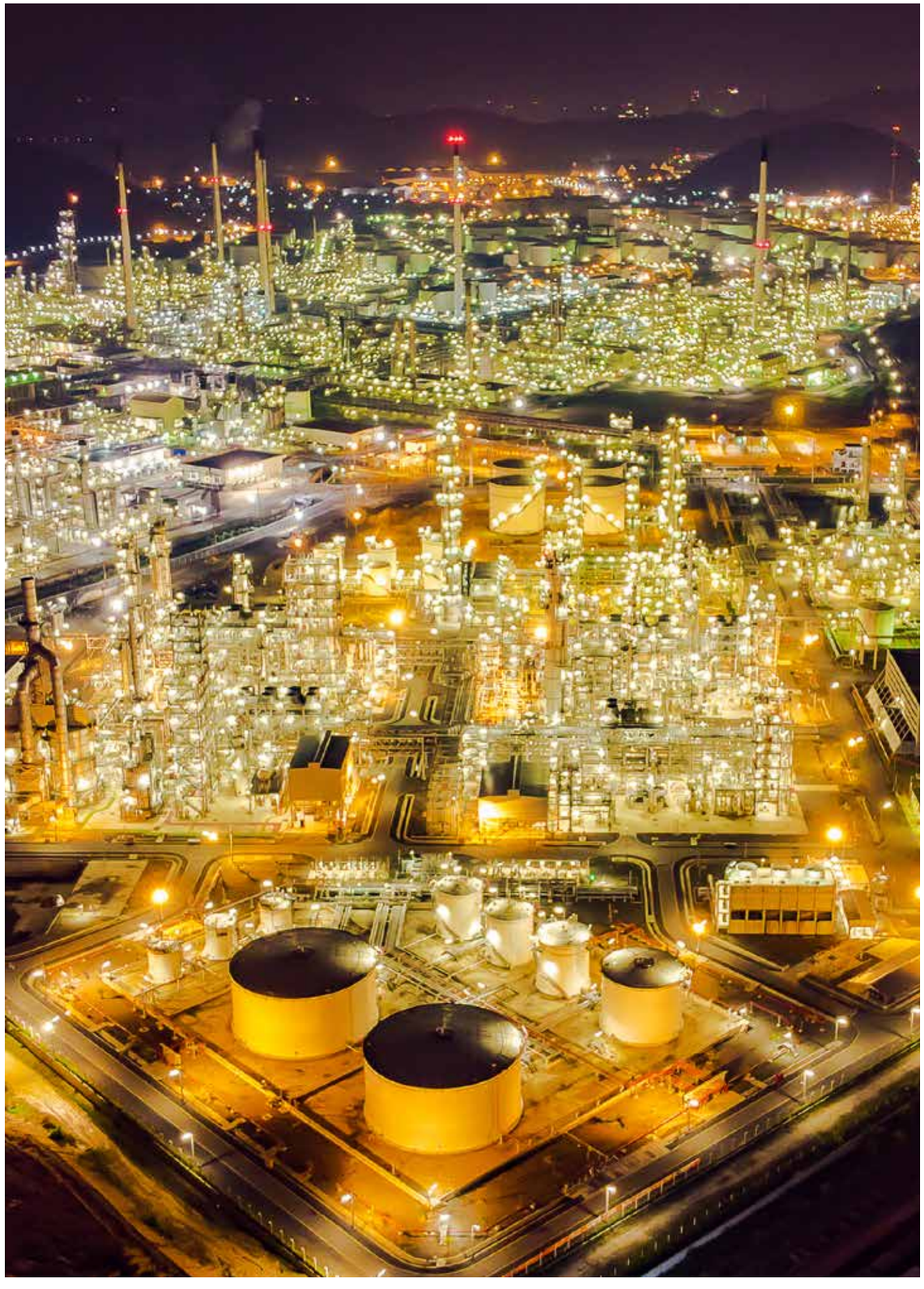

The "Dawn of New Energy"

A Collaborative Approach to Net Zero

H.E. Eng. Mohamed Ibrahim Al Hammadi, MD & CEO, Emirates Nuclear Energy Corporation (ENEC)

COP26 revealed that the sustainable future of our planet requires urgent and immediate action. One of the most important themes was the need for greater cross-sector collaboration.

Without working together, it will be harder to enable net zero strategies and deliver paths to sustainable growth and limit the impact of global warming. The path to net zero is complex, and unique for every nation. Regardless, we must find new ways to meet surging energy demand while rapidly reducing carbon emissions. The UAE has a productive and science-based approach to energy policy, which has enabled the country to lead the way towards a sustainable energy future. We were the first in the region to sign the Paris Agreement in 2016 and we recently became the first OPEC nation to commit to achieving net zero by 2050.

To deliver on these goals, we have chosen to focus on collaboration. We have also implemented a net zero strategy that recognizes the advantages of multiple technologies and industries working together. By adopting a long-term and diversified energy portfolio, we have succeeded in securing greater security, stability, and resilience of our electricity grid. We have also paved the way for the rapid decarbonization needed to achieve our climate goals. This approach has seen the implementation of clean energy by creating the world's cheapest solar plants and having a world-leading nuclear energy industry.

Both solar and nuclear are the cornerstones of the UAE's clean energy transition. But while we are investing in the future, we are also very realistic about available technologies. Even as we diversify our energy mix to become more sustainable, the world will still need oil and gas for decades to come. This is a strategic resource that underpins much of modern life today and it will continue to be in the future.

Efforts by the oil and gas sector to become more sustainable are very impressive. ADNOC's position as the world's least carbon intensive oil and gas producer demonstrates the strategic role the sector plays in tackling climate change. It also provides another example of the UAE's leadership in the clean energy arena. By utilizing and investing in all energy forms available, we have chosen to maximize our resources – efficiently and sustainably.

1st
clean energy certificate scheme for nuclear power was launched by Abu Dhabi last September.

1mn tons
of clean hydrogen per year could be generated by the Barakah Nuclear Energy Plant.

18%
of global energy demand is expected to be met by clean hydrogen by 2050.

$30trn
is the global value of ESG investments – a number that is expected to double by 2030 (IEA).

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"We hope to be pioneers for a more sustainable net zero future by illustrating the value clean energy investments can make to the economy."

Value of the Barakah Plant

At ENEC, we are proud to be part of the UAE's success story in implementing a sound and diversified energy portfolio. Utilizing our nation's expertise in energy and mega-project delivery, we have developed a program that is now the global benchmark for nuclear new builds. Electricity is the most in-demand energy source today with global demand increasing by 3% in 2021. Our first unit at Barakah, which commenced commercial operations last year, is the largest single generator of electricity in the UAE, providing 24/7 clean electricity. Barakah is driving the largest decarbonization effort in the history of the nation's power sector, significantly contributing to decarbonizing Abu Dhabi's power and water sector by 50% by 2025 by preventing more than 22.4mn tons of carbon emissions annually. It will also generate 85% of Abu Dhabi's clean electricity, enabling clean, 24/7 baseload power across the country.

New energy horizons

More importantly, we are starting to see a new momentum in nuclear energy from global economies. Countries like the US, France, UK, and China have announced major plans to increase clean electricity production through more nuclear plants. We are very glad that our nuclear program has paved the way for other nations on how this could be done. We have proven that nuclear plants can be delivered to high standards of safety, have security performance, and be built in a timely manner. The outcome is a clean energy system that is stable, efficient, safe, and resilient and supports our country's ongoing economic development and net zero goal.

The potential for clean energy moving forward is wide reaching – and the role of nuclear and renewables is instrumental. To stay ahead of the curve, the UAE is already looking into further applications of nuclear technologies, including hydrogen as a clean fuel. This low carbon fuel is essential to transition to a net zero world, especially for hard-to-decarbonize sectors and it is expected to account for 18% of global energy demand by 2050. The nuclear sector, with its plentiful zero emissions electricity and high purity steam, is poised to capitalize on this new growth market. In fact, the Barakah units have the potential to generate around 1mn tons of hydrogen per year.

At the same time, the oil and gas industry plays a crucial role in the generation of hydrogen, the first being blue hydrogen via CCS infrastructure, which is already underway. This illustrates how both the nuclear and fossil fuel sector are working together to put the UAE on the path to becoming a key player in clean hydrogen generation.

Green finance

We hope to be pioneers for a more sustainable net zero future by illustrating the value clean energy investments can make to the economy. Globally, ESG investments are valued at roughly $30trn and the IEA projects overall investment to double by 2030. Last year, Abu Dhabi became the first market to recognize nuclear as a form of clean energy for green certification. Through the certification, 100% of the electricity drawn from the UAE's grid by ADNOC is powered by electricity generated by either the Barakah Nuclear Energy Plant in Abu Dhabi or Abu Dhabi's solar facilities. This also illustrates how clean electricity can support other sectors to continue to grow in a clean and sustainable manner. The EU has recently announced plans to include nuclear and gas as part of its taxonomy, further demonstrating the essential role these baseload sources play and the potential for clean investment in these industries.

The UAE has become a case study for other global clean energy transitions. We have opened the world to opportunities in our industries and economy. The result will be on display for the world to see at COP28 in the UAE in 2023 – where we will share our experiences and lessons learned on our clean energy journey.

China's Energy Outlook 2022: Supply and Demand?

Xavier Chen, President, Beijing Energy Club

We should revise the hypothesis that Chinese oil demand will continue as it has done in the past ten years. It is reaching a plateau and may already be peaking at 14-15mn b/d.

One reason is weakening macroeconomic prospects. Combined with growing supply chain disruptions, we have overall weaker growth. China achieved 3.2% GDP growth in 2020 and the government has projected 8% for 2021 and 5% for 2022. Government policy is putting more emphasis on economic stability and security, and less focus on growth. In the past, when China had a problem with economic growth numbers, it would implement stimulus packages, but the government today does not have as much money to do this and is focusing on security of employment and domestic issues instead. Contributing to this weakening perspective is the deteriorating international environment – notably China's political relationship with the US and trade wars with various countries. There is also massive substitution taking the place of oil. In 2020, China sold 1.3mn electric vehicles (EVs) and 3.3mn last year.

Natural gas needs

Chinese gas demand will continue to rise, growing by approximately 12% in 2021. The country still has room to double its gas demand in the next 20 years. Gas will be a new focus, not only for domestic Chinese energy companies, but also a new source of demand for OPEC countries and neighboring suppliers like Turkmenistan, Russia, and Myanmar.

Energy crunch crisis

China suffered widespread power shortages last year essentially due to shortages of coal, which accounts for 70% of the country's power generation. There were excessive efforts to close the coal mines in addition to the political issue with Australia, which caused a disruption of exports to China. Plus, the government had a domestic power pricing issue when they set caps on what prices coal-fired power plants could charge, even as coal prices rose, reducing the incentive for power plants to generate electricity. Combined, these factors caused a lot of power rationing and disruption.

"China has decided that the climate change war cannot be 'won in one battle'. And so, coal-fired power plants – which account for 70% of the country's power generation – should be phased down based on the availability and reliability of alternative energies. These are very powerful statements, showing that China has again put supply security ahead of decarbonization."

China's climate commitment

China is already in the implementation stage of its energy transition and has realized what problems that can also bring, such as power shortages. There was also a race last year to reach net zero by the provincial authorities, with dramatic measures to cut supply and control energy demand. Following the government economic policy meeting last December, the communiqué declared that the climate change war could not be 'won in one battle' and that coal-fired power should be phased down based on the availability and reliability of alternative energies. These were very powerful statements, showing that China has again put supply security ahead of decarbonization. Ultimately, reducing CO_2 emissions is subject to several boundary constraints – such as energy supply security, continued economic growth, employment, and financial security.

The Covid effect

The 'zero Covid' approach has not been the right way to manage the pandemic. Covid-19 has become a political issue and China wants to maintain absolute control to ensure no disruption to the Winter Olympics in early February and a successful political party Congress in October. So, until then, it's unlikely that China will manage Covid-19 in any other way. That is going to mean more restrictions and more cities under lockdown, which will restrict demand for oil and transport.

#1
China is the world's biggest consumer of primary energy.[1]

3.3mn
electric vehicles (EVs) were sold to Chinese buyers last year – nearly three times higher than volumes sold in 2020. This is one of the reasons for the country's plateauing oil demand.

2042
could see China's demand for gas double on current levels. Even amid the Covid-19 pandemic, demand rose by 12% last year.

94%
decline in China's coal consumption could be seen between 2018 and 2050 – a monumental achievement for the world's biggest coal consumer if it is realized. This is the upper range of the reduction, which starts at a 44% reduction within the same time period.[2]

55%
of China's total power generation by 2050 could come from renewables. This is the upper goal of a range that starts at 34%.[3]

5%
growth in China's GDP is anticipated this year, lower than the 8% in 2021 and higher than the 3.2% in 2020.

[1] Statista; [2] BP Outlook, China; [3] BP Outlook, China; all unreferenced sources have been provided by the author.

A New Era of Geopolitical Diplomacy?

Dyala Sabbagh, Partner, Gulf Intelligence

Many geopolitical moves in the GCC last year could bear fruit in months to come, notably a tentative restart of nuclear negotiations with Iran and several regional diplomacies.

It is good timing, for the US' pullback from the region – albeit in a manner that still lacks clarity – means strategic diversification and collaboration are more necessary than ever for the GCC. We are witnessing the early moves of a switch from an era of confrontation and conflict to one of consolidation and reliance on commerce. The UAE's broad-ranging partnership with Israel is a primary example, as is the welcomed news of a reconciliation between Qatar and other Gulf countries.

Saudi invites alliances

Saudi Arabia is opening its doors ever wider to foreign investment and easing social restrictions, as part of its huge push to diversify its oil-centric economy. The Kingdom is also keen to advance innovation by leveraging the expertise of its energy sector, developing hydrogen and desalination technologies that could eventually be exported worldwide.

12.4%

increase in foreign direct investment (FDI) inflows in the GCC in 2020, reaching $27.7bn, reflect how the region's bid to broaden its global appeal is working.[1]

2.6%

collective growth rate in the GCC is anticipated for 2021.[2] This robust recovery is largely due to strengthening oil prices, advancing regulatory frameworks, and effective vaccination rollouts against Covid-19.

[1] Economist, UN's annual World Investment Report (WIR), June 2021;

[2] World Bank Gulf Economic Update (GEU), "Seizing the Opportunity for a Sustainable Recovery.

The GCC wants to avoid choosing sides between the behemoths of the US and China – its main strategic partner and its biggest customer, respectively.

Iran's crossroads

The weakest link in the region remains Iran. The potential collapse of the Joint Comprehensive Plan of Action (JCPOA) may be averted, however, as there are signs that an agreement may be reached. The latter would reopen significant trade potential with the GCC.

Quid pro quo

Regional interconnectivity, infrastructure, and trade are increasingly prominent on the energy agenda this year – especially in the Gulf and Eastern Mediterranean. For example, the UAE is funding a project for a solar farm in in Jordan, which could provide electricity to Israel, with Jordan securing access to clean water from Israel in return. The UAE also wants a shortcut to homegrown innovation capacity, which Israel provides. In return, Israeli innovators can access the vast global connections of the UAE's market, enabling them to expand their financial interests. To the north, Turkey's economic crisis could benefit from GCC countries' support. Still, implementing such projects requires trust and confidence – a regional novelty, which will be tested.

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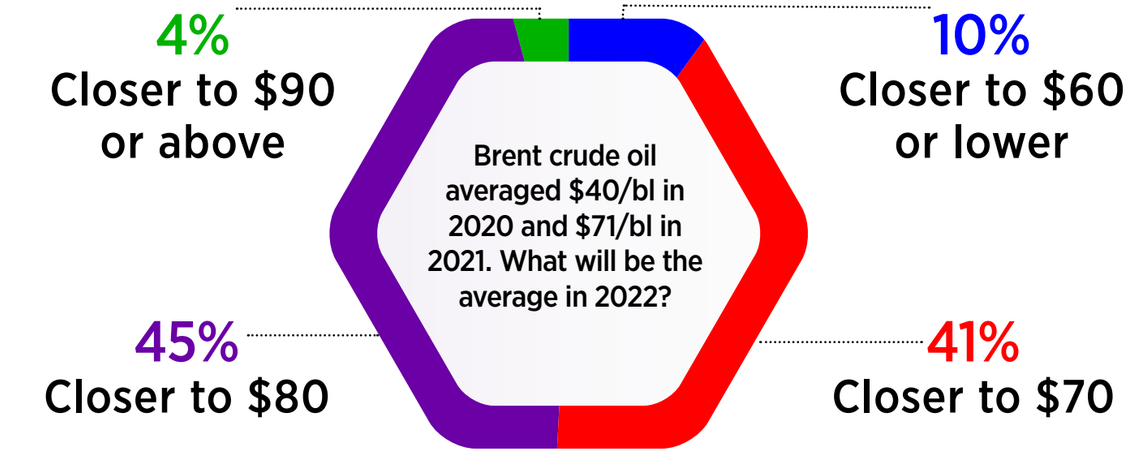
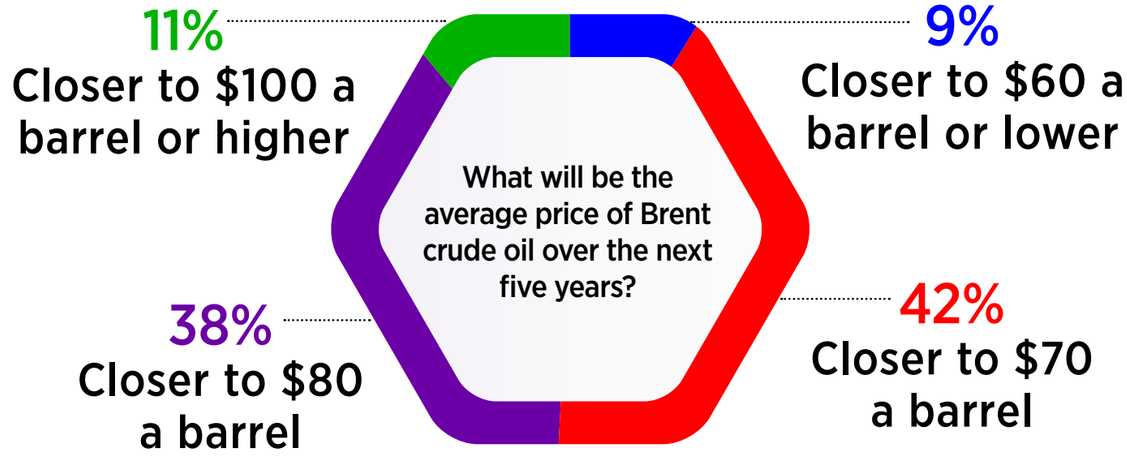
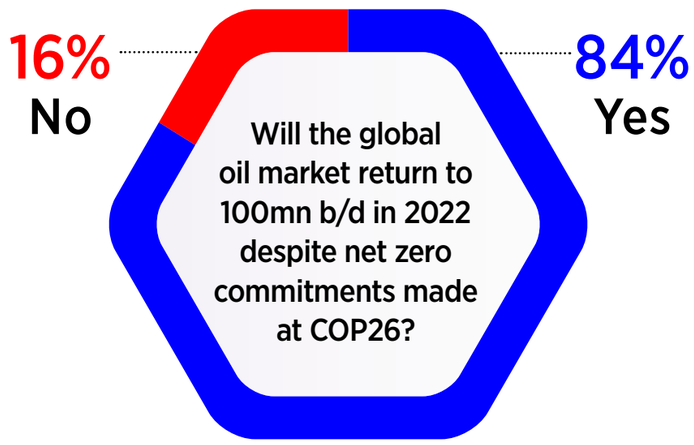
US-China Cold War

The GCC wants to avoid choosing sides between their main strategic partner, the US, and their biggest customer, China, in a US-China Cold War. China continues to seek and secure market share in under-invested areas in the region, honing its competitive advantage. The US does maintain some leverage on China's energy supplies with its hegemony over the waterways of the Gulf, but it will still be tough for Washington to push Beijing's influence aside.

ENERGY SURVEY: BLENDING OIL AND NET ZERO IN 2022?







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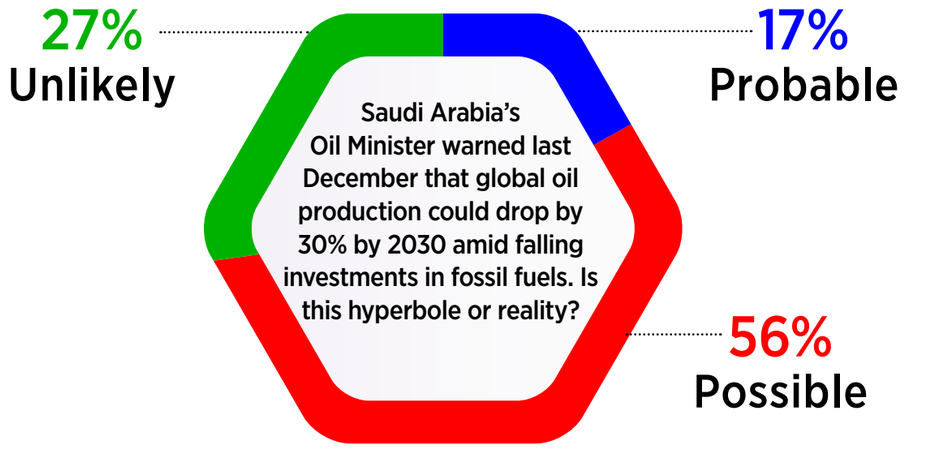

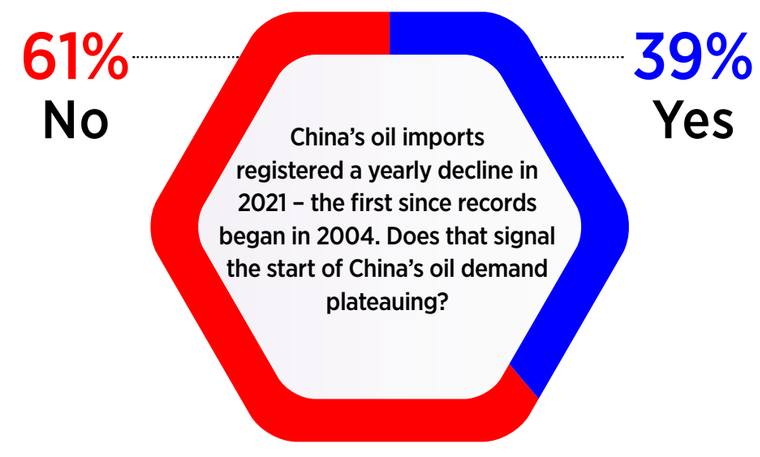

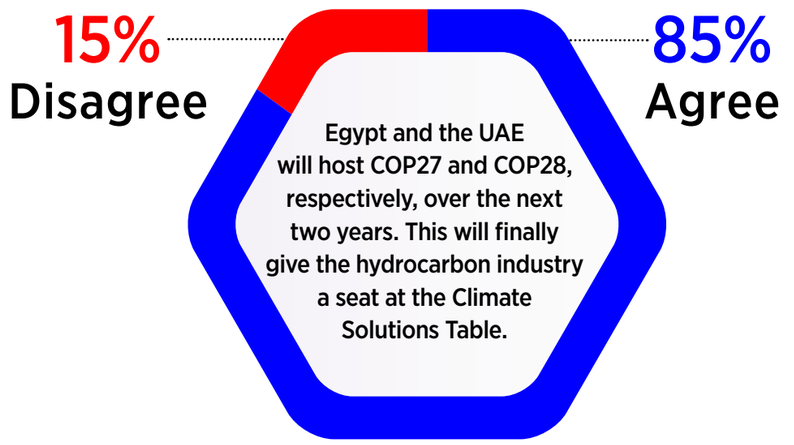

UAE National Energy Industry: A Roadmap to Reach Net Zero?

- **H.E. Yousif Ahmed Al Ali, Assistant Undersecretary for Electricity – Water & Future Energy Affairs, Ministry of Energy & Infrastructure, UAE**
- **Hatem Al Mosa, CEO, Sharjah National Oil Corporation**

Has the UAE laid the foundations for its 2050 net zero roadmap?

H.E. Yousif Ahmed Al Ali
The UAE is well on its way to reducing its carbon footprint. It was the first nation in the region to announce ambitious renewable energy programs. In 2006, the country set a 7% target for renewables in its energy mix. This is now a 24% target, which we expect to achieve in the next two years. The UAE has a mix of clean energy sources and nuclear plays a very important role within that. We also have almost 6GW of solar energy, half of which is operational, and the remainder is expected to be operational in the next few months. The UAE is at the forefront of adopting sustainability and carbon reduction technologies. It was the first in the region to build carbon capture and storage (CCS) and waste-to-energy projects and it has the lowest carbon footprint per oil barrel. ADNOC's CCS project's current 800,000 tons of capacity aims to reach 5mn tons of CO_2 capture each year by 2030.

Hatem Al Mosa
Net zero is a formidable task for any country, no matter how advanced. Many countries, including the UAE, have stated their intention to reach net zero by 2050, but we have yet to see a roadmap. Net zero means that every sector and everything that uses energy in a country is netted out to zero. This requires all parties to work together on an action plan and it requires collaboration between all energy players and all sectors that consume energy.

H.E. Yousif Ahmed Al Ali
Nobody has an absolute clear plan on what needs to be done to achieve net zero by 2050, nor what technologies will be needed. What we can focus on today, however, is the low hanging fruit, such as successfully operating our nuclear plants towards this goal. Plans beyond that still need to be studied and discussed between different entities. Under the umbrella leadership of the UAE's Ministry of Climate Change and Environment, we have representatives of all stakeholders who will work together to achieve net zero. The Hydrogen Leadership Roadmap, for example, has been announced from the Ministry's side.

> *"Net zero is a formidable task for any country, no matter how advanced. Many countries, including the UAE, have stated their intention to reach net zero by 2050 – but we have yet to see a roadmap."*
>
> – Hatem Al Mosa

> *"Subsidies are a thing of the past."*
>
> – H.E. Yousif Ahmed Al Ali

Could the UAE further leverage its existing gas infrastructure?

H.E. Yousif Ahmed Al Ali
The UAE has natural gas networks nationwide, so gas produced by ADNOC in the southwest of the country can be used in Fujairah, for example, and so on. We have very good infrastructure when it comes to interconnections between gas, electricity, and water.

Hatem Al Mosa
Natural gas is going to be the main transition player to achieving net zero. To deliver energy reliably – 24 hours a day, 365 days a year – we need all types of infrastructure. This includes gas storage, energy storage, hydrogen storage, plus transportation and consumption infrastructure.

Would the UAE government subsidize electricity to make green hydrogen work?

H.E. Yousif Ahmed Al Ali
Subsidies are a thing of the past. It took us a long time to get away from them, so it would not be wise to think of doing so again. Instead, we need to support R&D in technology and help the creation of the legal infrastructure to ensure we have sustainable and economically feasible projects.

24%
is the percentage of renewables that the UAE wants to have in its energy mix in the near-term – a goal it expects to achieve by 2024.

$160bn
investment up to 2050 was pledged by the UAE last December to hasten renewable energy development, as part of its net zero target by mid-century – the first country in the Middle East and North Africa (MENA) region to set such a climate goal.[1]

7
low carbon hydrogen projects are underway in the UAE, which announced its Hydrogen Leadership Roadmap last November. Part of the UAE's plans is a 25% market share in key export markets, including Japan, South Korea, Germany, and India, along with other high-potential markets in Europe and East Asia.[2]

[1] The National; [2] WAM, UAE

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Economics of clean hydrogen?

Green and blue hydrogen are the future, but they are not currently competitive with gas. The downstream process of turning gas into blue hydrogen is an extra cost. Green hydrogen requires significant advancements in electrolysis technology to make it more competitively priced, for example. Eventually, green hydrogen could cost less than $15, or even less than $10, per million BTU ($1.4 - $2.0 per kg). It is doable – we will get there in ten years.

– Hatem Al Mosa

Energy & Investment – Mind the Gap: Irresponsible vs Responsible Capital?

Badar Chaudhry, Senior Vice President, Unit Manager, Energy Sector, Mashreq Bank

Stricter regulations, shareholder expectations, and an overarching global climate change agenda are shedding a spotlight on the investment gap in oil and gas.

Investment in upstream oil and gas dropped by 25% in 2021, to approximately $240bn. To meet energy demand going forward, $500bn per year is required – so it is critical to strike the right balance in funding conventional and non-conventional resources.

In the Middle East, national oil companies (NOCs) are working on cleaner and greener production solutions for their oil and gas, which in turn is boosting their Environmental Social Governance (ESG) credentials and attracting more international investors. The industry is not only a source of energy, but also a feedstock in industries that whole economies depend on (such as petrochemicals) and therefore, must be preserved. Oil and gas revenues are also needed to finance new technologies and cleaner energy as part of the transition.

25%

decline in upstream investments for oil and gas last year brought the total investment to $240bn. Approximately $500bn per year is required to meet future energy demand.

$50trn+

in ESG assets are anticipated by 2025, representing more than a third of the projected $140.5trn in total global assets under management (AUM).[1]

[1] Bloomberg Intelligence

Variables matter

Future investment strategies in oil and gas require comprehensive consideration. Economic and demand growth forecasts for the next ten years differ widely, as do price expectations – therein lies one challenge. Against this backdrop lie difficult questions. Should oil and gas investments in poorer nations, which have no other option on which to build their economies, be discouraged? Do the same rules apply to wealthier nations? ESG comparisons are also using different metrics. All these factors, and many more, need clarity for sustainable and profitable investment decisions to be made. The transition must not move too quickly – the world needs higher fossil fuel prices to fund the transition. Plus, energy markets still need to find resolutions to key climate issues, such as carbon pricing and storing renewable energy.

An array of capital

NOCs are becoming more creative in tapping different sources of finance – one reason why financial structures are changing in the region. This includes Saudi Aramco's debut initial public offering (IPO), other regional companies' large and competitively priced debt financing packages, plus more green-orientated finance. Egypt became the first sovereign from the MENA region to issue a green bond in late-2020, for example, spurring similar requests from other nations in the region.

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Up production, cut emissions

A healthier oil price and an increasingly strict climate agenda are causing NOCs to hasten their oil and gas production in a bid to capture as much market share as possible. Therein lies a delicate balancing act. Saudi Arabia and the UAE have invested in projects to enhance their oil production capacities – Saudi Arabia is targeting 13mn b/d by 2027, for example – yet the Kingdom and the UAE have also committed to net zero by 2060 and 2050, respectively. How to hit both goals in a timely and cost-competitive manner remains to be seen.

IN FOCUS

Global Macro Economic Outlook

Khatija Haque, Chief Economist & Head of Research, Emirates NBD

While the rapid spread of the Omicron variant of Covid-19 disrupted some activity at the start of 2022, it looks likely that the impact over the year will be manageable – especially as countries start to cut self-isolation times.

Global growth will likely slow in 2022, with the International Monetary Fund (IMF) forecasting 4.4% growth, down from an estimated 5.9% in 2021 (based on projections in October 2021). This is predicated on the reopening gains having largely been won last year. However, ongoing supply chain issues and associated high inflation present a challenge to growth. Plus, high energy costs in winter will constrain household finances in many northern countries, potentially weighing on consumption.

A more balanced 2022

Oil prices began 2022 on a strong footing, supported by some near-term supply disruptions in North Africa and North America. Even the prospect of the US' tighter monetary policy did not appear to derail the potential for high oil prices. OPEC+ is still adding to monthly production and is likely to restore all its pandemic-related curbs by mid-2022. Markets appear to be interpreting OPEC+'s increased output as a sign of confidence that demand will be robust enough to absorb additional barrels. Aside from OPEC+, production from the US, Canada, and others is likely to move higher by December. Overall, demand is likely to return to pre-pandemic levels by the second half of this year.

Oil demand is likely to return to pre-pandemic levels by the second half of this year – even as growth slows compared with 2021

US: Policy Focus turns to inflation

There has been a steady improvement in the US' labor market in recent months, with headline unemployment falling to 3.9%. Plus, the proportion of prime age workers in employment has risen to levels last seen prior to the pandemic. But Consumer Price Index (CPI) inflation has risen markedly to 6.8% – levels not seen for nearly 40 years. With these dynamics and others in play, the Federal Reserve's focus is now squarely on containing price growth, especially as consumers' confidence has already fallen far below historical averages. Meanwhile, the US dollar is likely to remain strong against peers like the Euro and Japanese Yen. And equity markets still generally appear relatively sanguine to the prospect of tighter monetary policy, although some specific sectors could endure volatility, particularly technology.

4.4%
global growth in GDP is anticipated this year, down 1.5 percentage points on the 5.9% growth rate in 2021.[1] Other leading estimates anticipate 4.1% growth this year.[2]

$100trn+
is the forecast for the world's total economic output this year – the highest level ever.[3]

6.8%
rate of inflation has been reached in the US, the world's biggest economy – a level not seen for nearly 40 years.

50%+
of emerging markets and developing economies (EMDEs) experienced above-target inflation in 2021, prompting central banks to increase policy rates.[4]

57%
of respondents to a survey by McKinsey expect both the global economy and countries' economies to improve by mid-2022 – noteworthy considering the pandemic recently triggered the worst economic squeeze in nearly a century.[5]

[1] IMF; [2] World Economic Forum (WEF); [3] Cebr, Reuters; [4] WEF; [5] IMF

IN FOCUS

The Gulf in Global Geopolitics: Navigating the Great Power Competition?

Dr. Jonathan Fulton, Assistant Professor of Political Science, Zayed University Abu Dhabi

Geopolitics have jumped ahead of market fundamentals as the major driver behind higher global oil and gas prices.

Currently, fears of a confrontation between the US-led NATO powers and Russia over the future of Ukraine have helped push crude above $90/bl. With concerns growing over dwindling global spare capacity, major producers in the Gulf find themselves once again in a key position to ensure global demand is met by ample supply. Meanwhile, a more active Russia has seen the Kremlin form a key strategic economic alliance with oil producers through the OPEC+ producer grouping. With Russia's current output of 10mn b/d, the grouping of producers currently controls around 45% of global supply – giving it tremendous power to influence prices.

31
security incidents targeting energy infrastructure in the Gulf occurred last year – a record high.[1]

60%
of the Gulf's crude is shipped to Asia.[2]

[1] S&P Global Platts Oil Security Sentinel; [2] Speaker

The Chinese government has long been reluctant to encroach on the US' strategic sphere in the Middle East. Now, that is changing.

Great Power Competition

The emergence of the "Great Power Competition" is one to watch in 2022. A policy to focus on China and Russia as major threats began under President Donald Trump and continues under the Biden administration. This raises several strategic challenges for the Gulf, including a "fear of abandonment" among Gulf states that are now beginning to question the US' guarantee to defend the region against all future threats. Therein lies an opening for China to deepen its influence in the Middle East – one it is actively taking. Unlike Russia, the Chinese government has long been reluctant to encroach on the strategic sphere of influence maintained by the US' military presence in the Middle East. But that is changing. For one, China and Saudi Arabia are discussing greater defense cooperation amid a surge in Beijing's military equipment exports to the region. Generally, the Cold War concept of the "West" is now a waning notion amid growing differences between the US and its traditional allies – including European powers – on several points since the global financial crisis in 2008.

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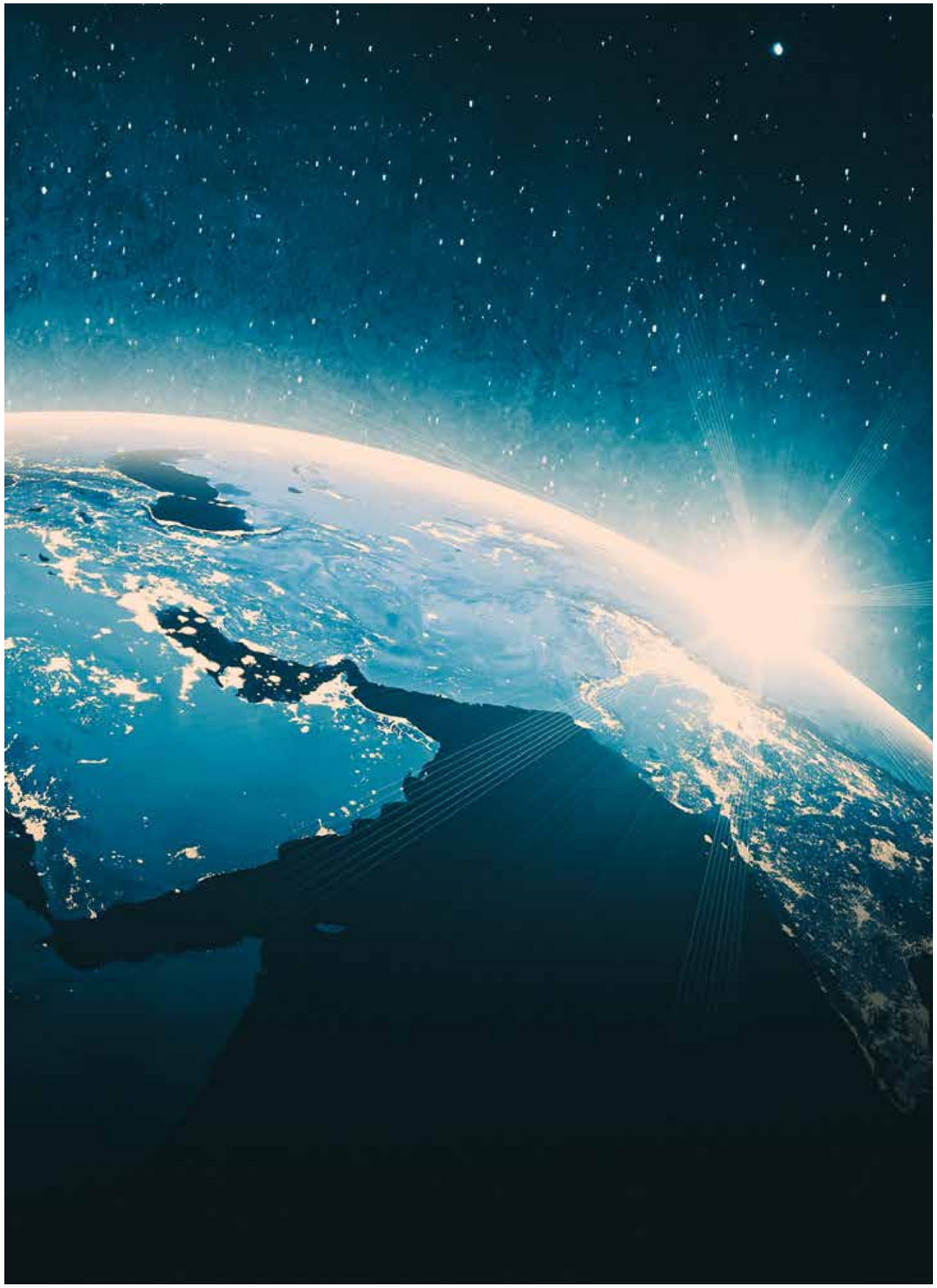

IN FOCUS

Utilities 3.0: Getting to Net Zero and Beyond?

Jeremy Crane, CEO & Founder, Yellow Door Energy

Utilities 3.0 signifies the distributed generation of power. In other words, power is produced where it is consumed, eliminating the need for transmission. The transition to Utilities 3.0 is enabling businesses to lower costs, achieve their carbon reduction and net zero objectives, and ultimately improve resilience.

We are fortunate to have an extremely reliable grid in the UAE. It is expected that half of the new generation capacity in MENA will be through distributed generation, with the other half coming from traditional centralized generation. The main driver is cost. Businesses are looking to reduce costs, especially in a post-pandemic world. For many manufacturers, their power costs are around 20% of their overall production expenses. If that can be reduced by 10%, 20%, or even 50%, then the business becomes more efficient and competitive. Generally, the distribution of power costs about 4-6 cents per kilowatt-hour. The cost of local generation is also about 4-6 cents for many of our customers. So, removing the distribution cost can halve the cost of electricity. On a national level, governments and utilities can reduce their capital investments. Instead of investing millions or billions of dollars in building new grid infrastructure, they can take down regulatory barriers for on-premises generation in designated areas and reduce power subsidies.

"There is not one utility model that wins."

"Instead of investing millions or billions of dollars in building new grid infrastructure, governments and utilities can take down regulatory barriers for on-premises generation in designated areas and reduce power subsidies."

The need for different utility models

There is not one utility model that wins. In the long-term, perhaps half of our generation would come from distributed generation in the industrial parks and commercial sectors. However, high-rise buildings still need centralized generation, which can be very effective. It is important to assess alternative energy generation sources. For example, we have a new customer that consumes 30MW hours on a continuous basis, so we provide them with a solution that couples solar with natural gas. Through this solution, the customer produces all the energy they need and saves 30-40% on their electricity costs.

It is also worth considering that the cost of battery storage is coming down. We also see alternatives to electricity storage in the form of thermal, or a time-shifting use of power. By 2025, we will be able to economically service 24/7 energy needs, even in lower cost energy markets like the UAE. This will come sooner for markets such as Jordan and Pakistan, where the cost of energy is higher.

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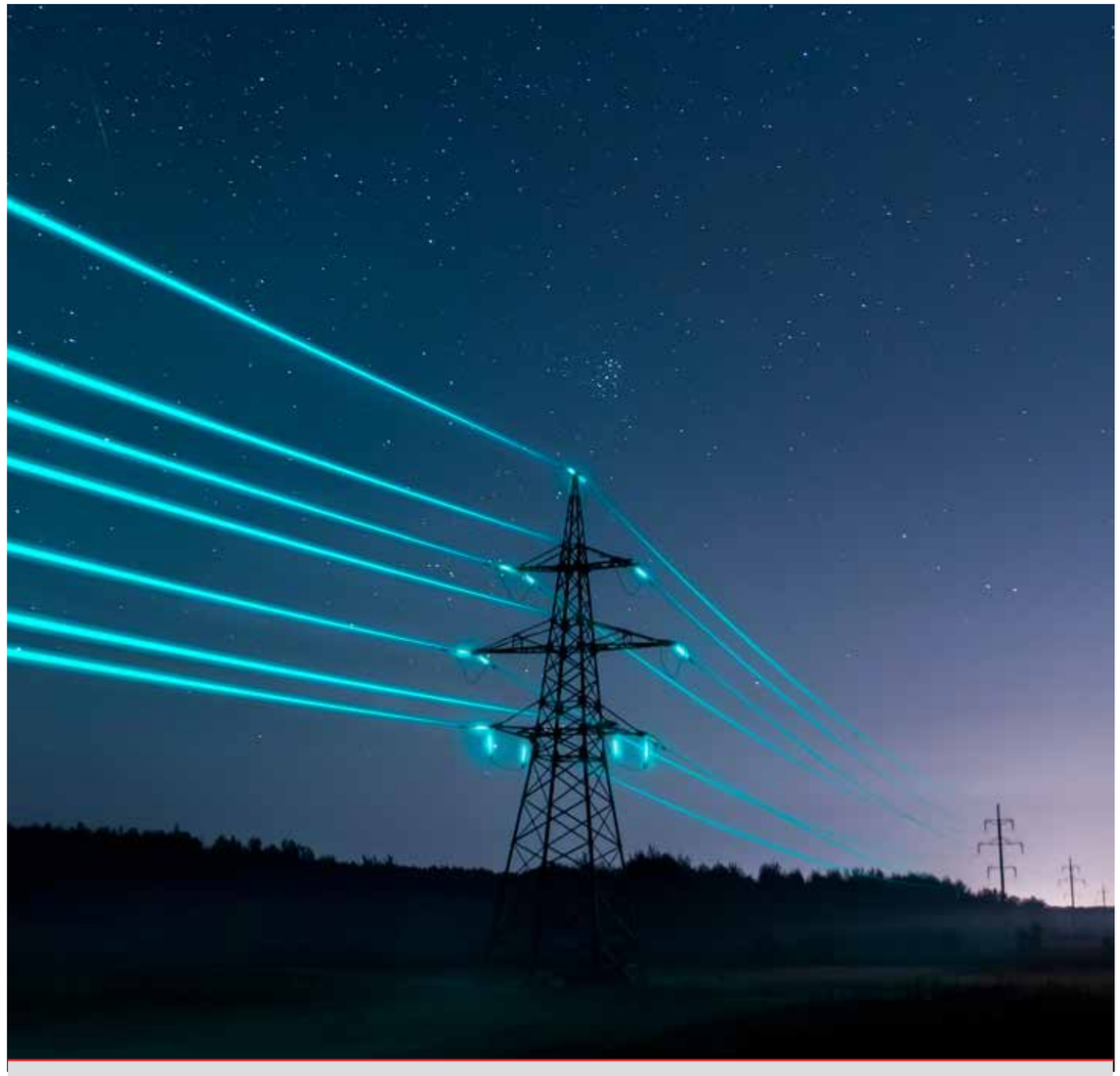

20%
of many manufacturers' costs are attributable to their power bill.

40%
savings in electricity costs have been achieved for one customer by combining solar and natural gas for their power generation.

$328bn
is the anticipated value of the global battery market by 2028. Part of this rising demand is from EVs. For example, Nissan Motors plans to invest in a new gigafactory with a capacity to manufacture 100,000 EV batteries per year.[1]

[1] Reports and Data

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IN FOCUS

Lessons and Language of the Climate Debate?

Dr. Frank Luntz, Visiting Professor, NYU Abu Dhabi & Leading US Election Pollster

Think of mothers

No matter where you are from, there is nothing that frightens a mother more than putting a glass under a tap and getting dirty water. Clean water is what we expect from a civilized society. So, think of a mother as you make your appeal for what you are doing on climate. The world has limited time, as highlighted by the muted results of COP26.

Health, health, health

The impact on health will be the number one component of the global climate conversation within a year. We talk about economic growth all the time – this is an academic term, but it is not something the public relates to necessarily. They want a healthy economy, a healthy marketplace, a healthy future, and healthy families. Therefore, stick the word "health" into your messaging wherever possible.

"No matter where you are from, there is nothing that frightens a mother more than putting a glass under a tap and getting dirty water. So, think "mother" as you make your appeal for what you are doing on climate."

UAE's best path

To start, embrace a focus on results and solutions, rather than metrics or measurements – this will help get the public on board. Also consider which words translate best from Arabic into other languages, especially English, to ensure the maximum level of global understanding. Some Arabic words have multiple or poor translations in English. I want the UAE to have the reputation it deserves. It will not get it unless people think the country is aggressively and effectively addressing the climate issue.

US vs UK

How we communicate directly impacts how we react, so it is very important to get it right for your audience. For example, the number one visual for communicating the importance of addressing climate change in America is the image of 'cradling of the earth', i.e., two hands passing the globe onto the next generation. In the UK, visuals that emphasize animal life have the greatest impact, even more so than images of fires or floods. In terms of language, the US tends to adopt a positive-consequence-positive structure to its messaging – beginning and ending with language like 'aspire' and 'achieve' and highlighting the danger in the middle. In the UK, language focuses more on the need for action, asking: What can we do now for a better tomorrow? And in turn, the country rewards those who move the fastest.

Make it personal

The word 'commitment' holds great weight and should begin and/or end your communication on climate, from the content on your website to your CEO's speeches. To be seen as a forward-looking and responsible company or government, your language must reflect your commitment to children and grandchildren, your commitment to protect and preserve the environment, your commitment to responsible governance, and so on. Plus, you must promote transparency, accountability, and enforcement – all of which are meaningful and measurable.

25%

more of the surveyed public favors the term 'carbon neutrality' over 'net zero'.

INSIGHTS

Energy Security vs Energy Transition: Where Should the Money Go?

Energy security and energy transition are arguably the same point. One cannot succeed without the other and any successes will rely on liquid and sustainable financial resources – so a careful balance is paramount. It is important to remember that one size will never fit all; countries, companies, and investors face different circumstances and so they must adopt different approaches.

Some nations are energy rich and have infrastructure at the ready, while others have fewer resources and larger populations, for example. As a fundamental rule, we cannot expect developing economies to move at the same pace as developed ones. But that does not change the fact that finding a balance as soon as possible between energy security and the energy transition is non-negotiable.

Greater uncertainty surrounds low carbon and renewable energy in terms of pricing, technology, and policy, yet great innovation is also being carried out. In contrast, conventional energy markets have longer been established and "know the ropes." Therein lies a valuable opportunity for knowledge exchange between the two, which in turn will help spur finances. Upstream investments in oil and gas must be near pre-Covid levels of $525bn up to 2030 to support energy security, while investments in clean energy must simultaneously more than triple from current levels to $4trn by 2030 to meet net zero by 2050.[1] Efforts are certainly underway across the globe, including $130trn of private capital allocated by the newly established Glasgow Financial Alliance for Net Zero – but there is still a long way to go to finding the right balance.

The long, thorny road of international negotiations to establish carbon offsetting systems will continue until an increased level of transparency is found.

ESG plus commercial viability

Awareness and education around the energy transition globally has started to pick up and is resulting in greater pressure on policymakers. The Middle East is at an advanced stage compared to other emerging markets, like China and India. This is in driven by a very public, positive, and proactive stance by regional governments. For example, announcements by Saudi Arabia and the UAE at the end of 2021 alone included $264bn worth of financial packages to support clean energy (itself ticking both energy security and energy transition boxes).

Carbon pricing must evolve

The biggest unknown policy today that unites both energy security and the energy transition is carbon pricing. Without clarity over pricing, governments and companies will struggle to fully commit and invest to energy security and the transition. They urgently need signposts. The long, thorny road of international negotiations and agreements must continue until an increased level of transparency is found.

We are all looking at the same energy-climate quandary, just through very different lenses. Each country, each company, and each investor will find different solutions – diversity that financiers must embrace.

Policy to encourage finance

There is no shortage of capital, but government-led strategies must improve to make it easier for the private sector to invest confidently and sustainably. In many places, energy economics are increasingly aligned with government policies, such as hugely ambitious solar power project developments in the UAE. But policymakers must do more to guide the private sector and in turn, the private sector must be more open-minded to new financing structures that support clean growth, such as green bonds.

$4trn

is the annual investment in clean energy needed annually up to 2030 to hit net zero by 2050 – nearly triple the world's current level of investment.[1] Simultaneously, the $500bn plus investment in upstream oil and gas before the Covid-19 pandemic must be recovered to help sustain energy security, having nearly halved over the last few years.[2]

$755bn

was the global investment in the energy transition in 2021 – rising by 27% from $595bn in 2020 and a huge gain on the $264bn in 2011.[3]

8.6%

of the world's operations are currently circular, which represents an untapped opportunity as a circular economy can yield up to $4.5trn in economic benefits by 2030.[4]

9mn+

deaths occur worldwide every year due to air, water, and soil pollution – this is equivalent to nearly the size of the UAE's total population. Investing in the energy transition has direct and significantly positive implications on global health.[5]

$100bn

is the potential size of voluntary carbon market by 2030.[6]

[1] IEA; [2] Speaker; [3] BloombergNEF; [4] World Economic Forum; [5] Guardian; [6] Financial Times

INSIGHTS

Net Zero in Exploration & Production: Urgent Challenges to Address in 2022?

As the major source of global emissions, the energy sector holds the key to responding to the world's climate challenge – and Exploration and Production (E&P) play a pivotal role.

So far, CO_2 emissions from energy and industry have increased by 60% since the United Nations Framework Convention on Climate Change (UNFCCC) was signed in 1992.[1] While we have seen a dramatic and positive surge in global commitments and actions from the energy community, including E&P, they are still far off what is needed to limit the rise in global temperatures to 1.5 °C.[2]

So, the energy community must leverage its thousands of years of collective experience more than ever to spur progress. Therein lies a particular opportunity for the Middle East's oil and gas community – historically the global hegemon – to showcase its central role as an energy innovator, especially in the lead up to COP27 in Egypt this November and COP28 in the UAE in 2023.

Over the decades, the oil and gas industry in the Middle East has identified hard-to-reach potential and then managed extremely large projects with highly complex engineering, often in dangerous environments. As one roundtable participant said: "If there is a group of professionals on the planet who can make a pivot to take the carbon out of hydrocarbon, it is the oil and gas industry." Still, the E&P community faces a difficult juggling act as it focuses on a two-pronged approach: increase output to meet demand while reducing CO_2 emissions to meet climate targets.

The first step for E&P? Establish a roadmap. The next 28 years up to 2050 are going to go in a flash – and we must be ready as soon as possible. It is so easy to talk about net zero – achieving it will be something else entirely.

If there is a group of professionals on the planet who can make a pivot to take the carbon out of hydrocarbon, it is the oil and gas community.

Optimize, optimize, optimize

Great progress can be achieved this year simply through the optimization of operations. Such efforts can generate up to two weeks of extra uptime for refineries, while halving maintenance costs, and using significantly less energy, one roundtable participant pointed out. Increasingly applying such approaches to E&P should yield similarly attractive results. This also directly links to being able to monitor and improve the carbon intensity (CI) of energy operations – a data point which will become far more scrutinized in 2022. Part of this means re-examining procurement decisions, which includes opting for more sustainable design choices and working with companies who are actively strengthening their ESG credentials. For example, up to 30% of construction materials at energy sites are wasted, another roundtable participant highlighted.

Ramp up digitalization

Embracing a digital toolbox will "make the difference in accelerating the energy transition now, versus waiting for efficiencies to trickle along," one roundtable participant stressed. Many digital aids are low-hanging fruit such as artificial intelligence (AI), robotics, predictive analytics, and big data. A 30% level of inefficiency exists across oil and gas companies' value chain. Against this backdrop, the investment in, and the integration of, technology will emerge as a "savior" for the E&P community as it supports the energy transition, another roundtable participant said. A greater focus on R&D in the Middle East will also help the region – already a technological trendsetter in many ways – enhance the commercial application of innovation in the energy markets. This feeds directly into reducing the industry's long-running challenge of being able to recruit and retain talent, as young talent is especially keen to work with forward-looking, digitally active companies.

Embrace carbon pricing

How carbon pricing will inevitably affect your business must be factored into internal discussions at the very least in 2022. "A carbon price of around $150 is more of a threat scenario for me right now, but I believe it will be the case in the medium-term," one roundtable participant explained. Another roundtable participant said his company operates on a five-year forecast of estimated carbon prices and runs sensitivity scenarios based on that, adjusting the portfolio if an area seems particularly vulnerable. Such proactive behavior must be the norm in 2022 as carbon pricing initiatives become a "must have" instead of a "nice to have" and the established initiatives – such as the EU Emissions Trading Scheme (ETS) – continue to mature. There are now 65 carbon pricing initiatives implemented worldwide, up from just two in 1990. Overall, these initiatives cover 11.65 $GtCO_2e$ in 2021 – representing 21.5% of global GHG emissions.[3] The funds generated by the implementation of a carbon tax can also be fed directly back into R&D for more incentive schemes for the private sector, including E&P, to help them embrace clean energy – thus greasing the commercial wheel of low carbon energy growth.

42%
is the percentage of global GHG emissions that are attributable to the oil and gas industry.

60%
rise in CO_2 emissions from energy and industry have been recorded since the UNFCCC was signed three decades ago.

21.5%
of global GHG emissions were covered by 65 carbon pricing initiatives in 2021 – up from two in 1990.

[1] International Energy Agency (IEA); [2] IEA; [3] World Bank, Carbon Pricing Dashboard

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Focus areas for E&P

- **Focus on what can be controlled:** Identify your CO_2 emissions and mitigate them, while working more closely with supply chains that are also focused on low carbon growth.
- **Focus on enhancing technology development:** E&P's influence and expertise means it has a responsibility to be a first mover in low carbon technology development.
- **Focus on building stability:** Poor energy security threatens health, civil dynamics, the environment, and much more. E&P has a responsibility to help sustain an even keel.

INSIGHTS

Natural Gas in the Middle East: Accelerating Low Carbon Goals?

Called the greenest fossil fuel, natural gas has a vital role to play in the energy transition – but there are still many areas that need work to reach its full potential.

Opportunities undoubtedly abound. For example, the CO_2 emissions in today's global power sector can be reduced by up to 1.2GT by switching from coal to existing gas-fired plants, assuming relative prices and regulations are supportive.[1] Doing so would bring down the global power sector's emissions by 10% and total energy-related CO_2 emissions by 4%. Gas is also viable at a scale that is not currently viable with renewable markets, which is pertinent considering the Middle East's soaring energy consumption and fast-growing populations.

Long-term push

The Middle East is home to 40% of the world's natural gas reserves, with huge investments already made in infrastructure, transport, and a globally competitive export market. Against this backdrop, the UAE wants to be self-sufficient in gas by 2030 and Abu Dhabi recently announced a plethora of gas project contracts worth $20bn in a bid to increase exports. Saudi Aramco is developing the $100bn Jafurah gas field and aims to have its power sector consist entirely of gas and renewables by 2030.

Cheap gas key to blue hydrogen

Billions of dollars are already being allocated to clean hydrogen projects around the world – a budding market that gas plays a major role in. The Middle East also has a significant competitive advantage over other geographies thanks to its vast supplies and established infrastructure. The global market for blue hydrogen is still at a very early stage, but political and corporate appetite is fast intensifying. Many countries – such as the UAE and Saudi Arabia – are setting ambitious growth targets and large utilities are making long-term purchase commitments. Part of the market's growth will include pinning down the economics, technologies, and talent needed to create a more sustainable outlook. For example, the full life cycle GHG emissions from burning blue hydrogen for heating were more than 20% greater than using conventional natural gas.[2]

Infrastructure & finance

The Middle East's access to gas as a feedstock and the region's extensive transportation networks for natural gas (and potentially blue hydrogen) nationally and internationally should help gas stakeholders attract competitive finance in 2022. But banks will also be somewhat cautious, wanting to see offtake agreements and/or government credit guarantees for projects – such structures give them more confidence to lend. Companies looking to tap international markets must also be more transparent in their disclosures to lenders and investors than ever before.

37%-79%
share of oil and gas in primary energy in the Middle East by 2050 is anticipated – clearly natural gas remains a key part of the energy mix.[1]

40%
of the world's natural gas reserves are in the Middle East.

$20bn
worth of gas project contracts have been accelerated by Abu Dhabi since last November.

[1] BP Outlook, Middle East; [2] Bloomberg

[1] International Energy Agency; [2] Cornell and Stanford Universities, S&P Global Platts

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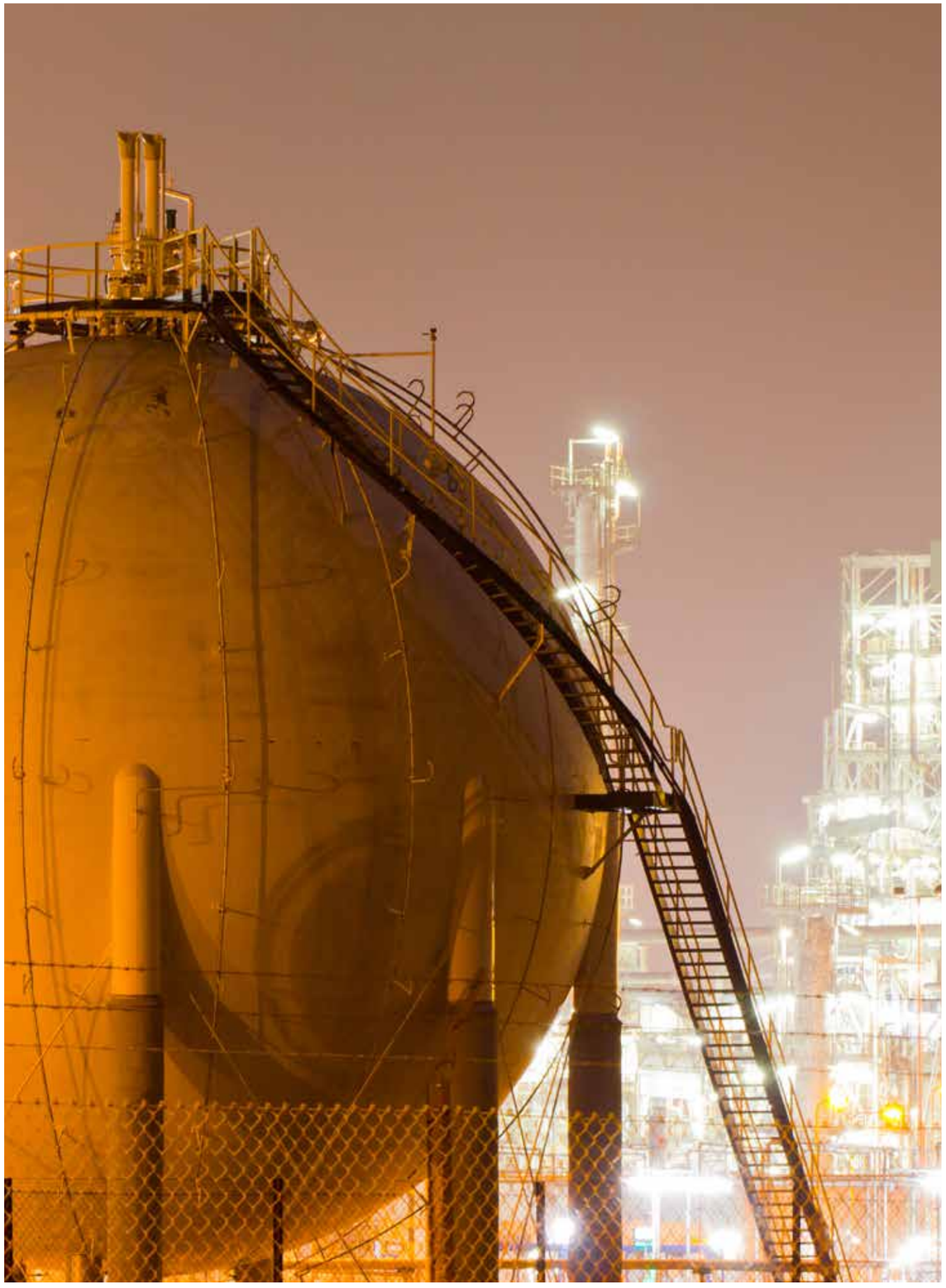

INSIGHTS

Digital: Leveraging Solutions to Accelerate Low Carbon Goals?

Digital technologies are vital allies in making low carbon growth across energy markets a reality – and yet, many are still underleveraged.

Bolstering the application of green technologies can help energy entities drive operational efficiency, streamline costs, enhance safety, and support investors' confidence to support in the energy transition. While awareness and appetite for embracing digital fluency is ramping up across the Middle East, many efforts are still fragmented, especially across national borders. Some nations like the UAE are making significant and innovative efforts, while others are still considering how best to proceed in what can be referred to as a "tsunami of digital offerings."

However advanced a country or company is in their digital journey, one point is unanimous: digitalization is not an overnight success. Creating long-term positive disruption across the complexity of the energy markets is not an easy nor cheap task – but the environmental and economic payback does greatly outweigh initial investments.

Scaling up

Scaling up digital technologies – notably those used in solar, wind, and hydro power generation, as well as CCS – is critical to maximizing their positive impact. Therefore, energy companies must "think big" when it comes to how they monitor, measure, and reduce emissions. Small, siloed efforts risk a stop-start process that investors eventually find frustrating, dulling overall appetite to embrace digitalization – a route that must be avoided.

Corporate agility and reinvention

Such reinvention could mean changing business and operating models entirely or just adopting low hanging fruit technologies to help reduce existing CO_2 emissions and optimize operations – any progress in the right direction is worthwhile. There is no rush to transform entire ecosystems into digitally enhanced entities overnight, as such a push can risk expensive mistakes. Equally, energy demand is expected to increase by 50% in the next three decades, so tens of trillions of US dollars must be invested in digital aids – the more creatively, the better.

Digitalization is not an overnight success – it takes talent, money, time, and collaboration. But the benefit of efforts today will last well into the 21st century.

Record, report, reduce, replace, remove

Data governance is critical to deliver carbon measurements that hold companies accountable to the carbon footprint they currently have, as well as the one they are aiming for. Poor data management starts to muddy these waters, which in turn risks data credibility and ultimately, reputational value. The benefit of data visibility has led to many ground-breaking moves in the energy management sector, such as smart buildings and EVs. Data is the building block to all things digital – without it, companies digitally enabled plans will crumble. Plus, the Middle East is interacting on a global scale and so it must meet global standards.

Upskilling talent

To convert to a data centric organization, companies must include data-centric talent – it is that simple. Accordingly, the energy industry must start to attract and retain talent that can bring in digital skills. A particularly positive development is that some technologies moving more into the mainstream – such as digital twins – enable organizations to reskill and upskill internal talent at a far faster rate, saving time and money while reducing risk.

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$1.3trn
of value can be captured in the global electricity sector with rapid digital transformation by 2025.[1]

1bn
households could participate in interconnected electricity systems by 2040, with 11bn appliances.[2]

25%
reduction in energy use can be achieved by the deployment of intelligence transport systems (ITS).[3]

50mn
tons of electronic and electrical waste (e-waste) are generated worldwide every year – weighing more than all the commercial airliners ever made. Only 20% of this is formally recycled.[4]

$62.5bn
is the economic value of the e-waste produced per year. Consider that there is 100x more gold in a ton of e-waste than in a ton of gold ore.[5]

[1] World Economic Forum; [2] International Energy Agency; [3] UNECE.Org Report; [4] UNEP; [5] UNEP

Consultancy
Intelligence
Publishing