PETRONAS

National Oil Companies & Partnerships

How to Prosper in the Digital Age?

2018 Whitepaper

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Whitepaper process: Key themes and ideas detailed in this document were harvested from a roundtable held under the Chatham House Rule which took place on the sidelines of ADIPEC in Abu Dhabi in mid-November, 2018

Two hats must be worn by national oil companies (NOCs) in the Arab Gulf and beyond; one as custodians of national energy security and the other as competitive players on the global energy stage. Mastering this juggling act amid intensifying pressures is no small feat. Leveraging forward-thinking partnerships and the digital toolbox as part of the 4th Industrial Revolution will help NOCs thrive in new territory.

A mountain of challenges too steep to scale alone confronts many NOCs and energy entities; unity will trump fragmentation *(Shifting sands: see below)*. The consolidation and diversification of Gulf NOCs' assets is gaining pace as stakeholders try to trim spending, increase output and support the region's National Visions for energy security and globally competitive, knowledge-based economies.

Realizing this goal means Gulf NOCs must continue their transformation into savvy INOCs – national oil companies with influence worldwide – according to 74% of respondents to a GIQ Industry Survey. Following in the steps of Asian peers (i.e. PETRONAS and Sinopec) and European peers (i.e. BP and Statoil) over the last two decades means evolving from the traditional dynamic between NOCs and international oil companies (IOCs). The simplified version of this relationship historically saw IOCs taking the lead in developing Gulf partners' plentiful oil assets; largely a win-win for both parties.

But the dramatic reduction in oil prices since 2014 has especially spurred a change of tact in NOCs' asset management and ambition. A new lease of life was given to oft-discussed plans to increasingly grow horizontally through diversification and vertically through integration. For example, many NOCs now have trading desks, which has historically been a remit of IOCs only.

Combining forces can yield greater economic, environmental and intellectual dividends *(Collaborative sweet spots; page 4)*. This includes broader access to government and third-party capital, a wider array of research and development (R&D) expertise, technologies and talent. In the UAE, the ADMA-OPCO concession was divided into three new separate concessions to maximize commercial value and expand state-owned ADNOC's partner base, for instance. This method also sought to develop partnerships that stretch along the entire oil and gas value chain.

Shifting sands

Collaboration and innovation are vital tools for NOCs and other energy producers trying to solve the 21st century energy puzzle. How to meet rising energy demand, hit the lower-carbon targets detailed in the Paris Agreement while preserving competitive balance sheets? Consider that this quandary must be solved against a backdrop of unpredictable oil prices, geopolitics and a talent shortage. In the Middle East alone, BP Outlook expects energy consumption to rise by 54% by 2040 and data from the United Nations (UN) suggests that the 39% rise in the UAE's population to 13.1 million by 2050 will be echoed across the region.

THE FUTURE IS DIGITAL

Digital fluency is not a nicety within NOCs' skillsets; it is a cornerstone needed for success in the 21st century. Late adoption risks crippling profits.

X2

In alignment with Moore's Law, computer power has doubled every year since the 1970s and more data has been generated in the last two years than in all of previous recorded history. Now, NOCs and other energy entities must learn how to use the data to extract valuable and cost-saving insights.

2023

Research reports company Stratistics MRC expects the global predictive analytics market to grow from $3.89 billion in 2016 to $14.95 billion by 2023 – a compound annual growth rate of 21.2%. Can companies afford to miss this digital bandwagon?

12%

The number of connected Internet of Things (IoT) devices worldwide will jump 12% on average annually, from nearly 27 billion in 2017 to 125 billion in 2030, according to IHS Markit.

20,000

At the beginning of the century, Ray Kurzweil, Futurist and Chief Engineer at Google, predicted that 20,000 years of progress would be crammed into the next 100. But the 4th Industrial Revolution means the rate of progress will be even faster. NOCs must keep pace.

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"What is one factor that NOCs and all other energy companies share? No matter what, they must keep evolving and keep moving. Hedging risk is often easier in a pack than alone, especially on a route littered with unpredictability."

33%+

By 2020, more than a third of the desired core skill sets of most occupations will be comprised of skills that are not yet considered crucial to the job today, according to the World Economic Forum (WEF). How can partnerships ensure that talent today have the skills to be the energy pioneers of tomorrow?

$600bn

Last year, cybercrime cost almost $600 billion, or 0.8% of the world's GDP, estimated McAfee. How can partnerships hone their safeguards against this rapidly-growing global mafia?

Will you catch the train?

The rate of change – and the pace at which industry must react – has drastically altered. Roundtable participants likened the need for agility and awareness to a 'man trying to catch the train of progress.' When the man sees little happening and bores of waiting on the platform, he briefly leaves to buy a coffee. Suddenly, the train pulls into the station and quickly departs before the man returns. Only a few people were ready and managed to board. Their vigilance will be rewarded; the first train enables forward thinkers to reap the dividends of the first mover advantage. The second train carrying the 'first followers' is also valuable, but the competitive and innovative edge of every train thereafter becomes increasingly dulled. Will your partnership get a coffee or be prepped on the platform?

"The compass setting for progress must point towards the horizon. This is even more crucial in an industry seeking solid ground amid a myriad of unknowns i.e. unpredictable oil prices and geopolitics."

This more collaborative ethos has helped NOCs overcome challenges in deep water oil production, brownfield enhanced oil recovery (EOR) and gas development in recent years, roundtable participants said. Careful navigation is still needed. For example, the experience of operating in competitive markets without a monopoly position is considered the biggest hurdle for Gulf INOCs that want to broaden their success internationally, according to 55% of survey respondents.

The compass setting for progress must point towards the horizon, especially as the industry seeks goalposts amid a myriad of unknowns i.e. unpredictable oil prices and geopolitics. Long-term partnerships are a key pillar of NOCs' risk management strategies, as well as other energy entities. Such commitments require firm but flexible financial structures, ambitious but realistic technology developments, sustainable corporate and social responsibilities (CSR) and deep-rooted talent enhancement. Confidence that both parties are fully engaged is also essential. Commercial divorces risk expensive reputational damage. Budding partnerships must also consider changing corporate structures. For example, the initial public offering (IPO) of 5% of state-owned Saudi Aramco that is scheduled to go ahead by 2021 – originally penciled in for this year – could influence the energy giant's data sharing practices and risk appetite later on.

Collaborative sweet spots?

Partnerships that combine intellectual, technological and geographic resources will help solve the conundrums busying boardrooms in energy companies *(Shifting sands; page 2)*. Enhanced oil recovery (EOR) is just one area that can be a pressure relief valve. EOR has been a core facilitator in exploration and production (E&P) for more than a century; a trend that continues to gain pace. Transparency Market Research expects the valuation of the global EOR market to soar from $38.1 billion in 2012 to $516.7 billion by 2023. Thermal recovery, steam injection, miscible gas injection, chemical recovery and Co_2 injection are all on the 'menu' of traditionally popular options. Solar is a recent addition, thanks to a partnership between state-owned Petroleum Development Oman (PDO) and GlassPoint to build the Miraah plant. The generation of 1,021 MW of peak thermal energy via solar panels that will direct 6,000 tons of steam a day towards EOR efforts at the sultanate's Amal field is a world first.

The value of forward-thinking partnerships also applies to thriving rather than surviving regulatory shifts. Take the International Maritime Organization's (IMO) ruling to introduce a 0.5% sulfur cap on bunker fuels, down from today's 3.5%, by the 1 January 2020, for instance. How could more dialogue between NOCs, IOCs, INOCs, technology companies and financial institutions lift the veil on the ambiguity surrounding one of the biggest changes in the shipping industry since engines replaced sails in the late 1800s?

Energy companies' collaborative journey is just beginning; there are a multitude of avenues to explore together. How can partnerships hasten the electrification of energy markets? How to affordably diversify refineries' crude palette to increase the supply of biofuels in the Middle East? Finding solutions by 2021 is key to support the UN's International Civil Aviation Organization's (ICAO) new offsetting scheme, the Carbon Offset and Reduction Scheme for International Aviation (CORSIA). How can partnerships improve the utilization of wastewater in energy production amid warnings by the World Economic Forum (WEF) that scarcity is a top global risk? How can partnerships help increase energy efficiency along the value chain? How can they create a common platform for data sharing and talent enhancement i.e. nurturing the intellectual pioneers of the future? How can partnerships enable the Middle East's oil and gas export market to support the almost doubling of energy demand that the Asian Development Bank anticipates in the Asia-Pacific up to 2030? Great effort precedes great reward; the clock is ticking.

DIGITAL FLUENCY

What appeared as a wave of technological jargon in recent years is increasingly finding its feet as valuable digital knowhow that can boost efficiency and affordability *(The future is digital; page 2)*. The World Economic Forum (WEF) defines the 4th Industrial Revolution as "a fusion of technologies that is blurring the lines between the physical, digital and biological spheres."

Oil and gas companies – both independently and in partnerships – must first understand and then take advantage of this new digital ecosystem. Open mindedness can unlock a treasure trove of economic efficiencies. Lloyd's Register (LR) said predictive analytics are saving companies $7 million on gas pipelines in the eastern US by giving a heads up on an upcoming failure, while Grand View Research estimated that the Internet of Things (IoT) will witness $933.6 billion of investments by 2025.

In alignment with Moore's Law, computer power has doubled every year since the 1970s. More data has

Three is not a crowd

A new player is stepping into the arena with NOCs and IOCs; Silicon Valley-esque companies. The growing influence of digitalization means technology and IT companies are helping the energy industry finetune their digital acumen. Nearly a quarter (24%) of survey respondents expect alignment between NOCs and companies from Silicon Valley to emerge as a popular partnership in the 2020s. This joining will lead the charge over the next decade, bar the prevalence of NOC-IOC partnerships (48%). Meaningful progress is already underway. Microsoft said its new partnership with Chevron will infuse the energy company with even more computing power to accelerate its work in data analytics and the Internet of Things (IoT). The partnership is part of Chevron's efforts to digitize its oil fields and accelerate deployment of new technologies. For example, engineers in Houston monitor data that arrives in five to ten seconds from drill sensors six miles beneath the earth's surface and across four continents. What's next?

"Industry is fast getting to grips with the wave of digital jargon that largely swept in following the significant oil price decline in 2014. Tangible progress is being made, but the digital aspect of NOCs' partnerships is only just beginning."

been generated in the last two years than in all of previous recorded history. Data generation is not the challenge; transforming it into valuable insight is. This will be one of the most valued skills in the next decade at least, so NOCs and the wider energy market should get a head start.

Roundtable participants pointed to the need to properly classify data to iron out time-consuming communication hurdles in partnerships. Classifying data into 'piles' that are private and public is key i.e. intellectual property (IP) versus information that can be shared in the collaborative process. This seemingly simple process is often overlooked. Getting the fundamental processes right really does matter.

Ensuring that the migration of these digital lessons and knowledge flows freely in NOC-NOC, NOC-IOC, NOC-IOC-Tech, and every other type of partnership, will help remove the bricks in the walls that are halting knowledge exchange *(Three is not a crowd; page 5)*. Equally, due diligence is critical to flag any weak spots in a potential partner's digital firewall before increasing said flow of information and data. Cyberhackers, the world's new and largely invisible mafia, are continually widening their destructive influence. The cost of cybercrime last year neared $600 billion, or 0.8% of global GDP, warned McAfee.

Having an 'intellectual army' to bolster protection against cyberattacks feeds into the importance of capturing the digital hearts and minds of both established and emerging talent. By 2020, more than a third of the desired core skill sets of most occupations will be comprised of skills that are not yet considered crucial to the job today, according to the World Economic Forum (WEF). Clearly, strategies to develop talent must be more proactive, imaginative and dynamic across all age groups and skill sets. A partnership is only as brilliant as the minds involved.

Partnerships are not a silver bullet, but they are awash with potential. Clear communication, transparent data and a zest for digital experimentation should underpin NOCs' offering as they seek sustainable and smart partnerships. Together, the industry can start climbing the mountain of challenges – safely and sustainably. ■

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