الإتحـاد الخـليجي للتـكرير
Gulf Downstream Association

Gulf Downstream Whitepaper II

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STRETCHING THE MARGIN

What are the Top 3 Strategies for Gulf Refiners to Stretch the Margin of Each Barrel of Oil Produced?

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Founding Companies

Knowledge Partner

EXECUTIVE SUMMARY

Think differently; this will be the much-needed relief valve on the intensifying pressure points facing refiners. More than half (55%) of respondents to a GIQ Industry Survey said refiners' reaction to market changes has a greater impact on stretching the margin of each barrel of oil refined; 45% said it is maximizing operational efficiency. Of course, it is both: two sides of the same operational coin.

What are the Top 5 Strategies to Improve Efficiency and Utilization?

- ✓ Talent: Optimize Operations, Improve Reliability
- ✓ Build Local Synergies
- ✓ Leverage Digitalization i.e. Predictive Analytics
- ✓ Product Diversity i.e. Chemical Integration
- ✓ Establish Catalyst Management Systems

**The Top 3 Recommendations are detailed on page 6-7*

What are the Top 5 Ways to Plan for Uncertainties?

- ✓ Enhance Collaboration and Partnerships
- ✓ Curate an Agile Culture
- ✓ Bolster Flexibility Along the Value Chain
- ✓ Create Environmentally Friendly Products
- ✓ Optimize Feedstock Processes

**The Top 3 Recommendations are detailed on page 8-9*

Connecting the Dots

The bulk of refiners' improved reactions and efficiencies have been in response to market stresses. For example, the declining oil price from 2014, settling in today's $60s/bl range, spurred efforts to streamline operations and cut costs. Since then, incentives have only swelled. From rising energy demand to stringent environmental targets as per the Paris Agreement, geopolitical strife and intensifying competition i.e. the US' burgeoning oil market. Refiners are in a new world of pressure.

Yet, efforts to adapt have not kept pace, even slowing in some cases. Now, progress must be accelerated in line with market pressures; all of which will only carry more influence in the 2020s. Refiners must operate a new status quo of heightened efficiency, regardless of market strain or robustness. This will lead to healthier market sentiment, less price volatility, greater confidence for much-needed investors and improved safety. The incentives far outweigh the challenges.

Ambitious Plans

The majority of respondents (58%) agreed that fully integrated international oil companies (IOCs) have established an internal culture that's lean, agile and relentless in stretching the margin of each barrel of oil produced. And they concurred that appetite among major Gulf refiners is strong enough to adopt this philosophy by the end of 2020. The remaining 42% do not have the same confidence in the tight schedule. But marked change among even half of the refining market this year would herald a cultural transformation. Every step of progress speaks volumes; not just for refiners' balance sheets, but for bolstering investors' confidence.

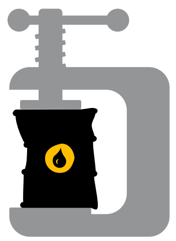
Amid the long-term slowdown that is forecast in refining capacity, 59% of respondents expect it to be difficult to justify building large new refineries in the Gulf region after 2025 (i.e. replicating Kuwait's 650,000 b/d Al Zour refinery and the UAE's 800,000+ b/d Ruwais refinery). Consider this survey result against expectations that refining capacity will grow more than 6.8mn b/d in the next five years, largely from projects in Asia and the Middle East, according to McKinsey. Clearly, refiners need to make it easy for ivestors to support their blueprints.

DEFINITION
4th Industrial Revolution

The 4IR represents a fundamental change in the way we live, work and relate to one another. The speed, breadth and depth of this revolution is forcing us to rethink how countries develop, how organizations create value and even what it means to be human.

Source: World Economic Forum (WEF)

Squeezing Potential



36%
The Middle East remains the largest oil-producing region up to 2040, representing 36% of global liquids, according to BP Outlook – Middle East.

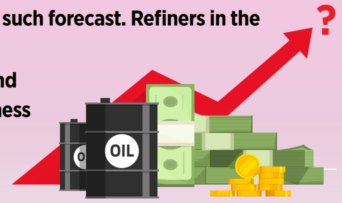
1mn b/d
Global oil rises by around 1mn b/d on average every year until 2025, according to the International Energy Agency's (IEA) Stated Policies Scenario in its latest World Energy Outlook.

27%
The global population will climb by more than 2bn – a 27% increase – by 2050 to 9.8bn. Increasing refining output at more competitive margins – i.e. stretching the value of each barrel of oil produced – is a safe risk-reward proposition.

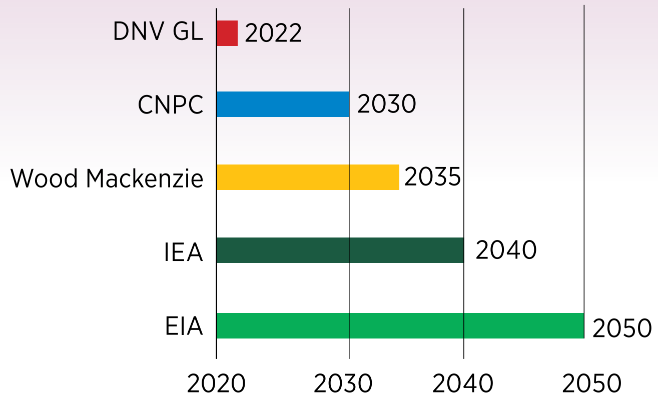
1st
The rise in Africa's oil consumption up to 2040 is larger than that of China, according to the IEA. Benefitting from proximity, streamlining operations and maximizing efficiency in the Middle East could spur refiners' offering to the region's continental neighbor. More than 500mn people will be added to Africa's urban population in the next two decades.

Peak Oil: Guessing Game Continues

Market forecasts are not crystal balls; different opinions abound. The year of peak oil demand is one such forecast. Refiners in the Gulf Cooperation Council (GCC) must be alert to this inevitability and sustain the industry's competitiveness in what will be an increasingly diversified energy basket.



International companies weigh in with their projections:



Source: GI Research, DNV GL, CNPC, Wood Mackenzie, IEA, EIA

Flexibility Wins

Integrated refineries with sophisticated flexibility, notably an ability to upgrade crude oil into high quality and cleaner burning fuels, will be the most attractive to investors in the 2020s, highlighted 75% of respondents. Others will become redundant as new market pressures that demand greater flex emerge.

For example, the International Maritime Organization's (IMO 2020) ruling to reduce sulfur limits in bunker fuels from 1 January 2020 was the most recent – and profound – test of Middle Eastern refineries' ability to adapt to major change. The competitive edge of integrated refineries, able to change their crude palettes relatively quickly, fared best. The value of such suppleness will only strengthen in the 2020s as more changes inevitably emerge amid the global transition towards a greener world. In the next decade, refiners will have to engage in the greener fuel conversations relating to the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) when it becomes mandatory from 2027 (the pilot phase starts in 2021).

Digital: Keeping Pace

Millions of US dollars have been wasted in poor efficiency as the Gulf's oil and gas downstream operators failed to take full advantage of digital disruptors, said 85% of respondents. This should read as an unnerving reveal considering digitalization has the potential to create around $1trn of value for oil and gas firms between 2016-2025, according to the World Economic Forum (WEF).

> **"When markets are positive, no one is concerned about bottlenecking their refinery. But this is old thinking!"**

More insights into how refiners can – and must – finetune their digital awareness and applications can be found in a Whitepaper from a GDA roundtable event in November 2019, titled *'Work of the Future and the Future of Work.'* As the pace of change will only accelerate, building digital fluency and adaptable intelligence (AQ) within the refining industry is critical. The latter relates to nurturing an ability to thrive and think critically and creatively in a fast-changing and unpredictable environment. Failing to digitally evolve means technology (or a lack of) will turn into a threat to refiners' business growth in the 2020s, workshop participants warned. This loops back to what should be the new game plan: refiners must think differently. As refiners enter a new decade, they must shrug off old habits in order to curate an efficient, competitive and digitally enabled future. When it comes to stretching the value of each barrel of oil, each inch of progress counts. ■

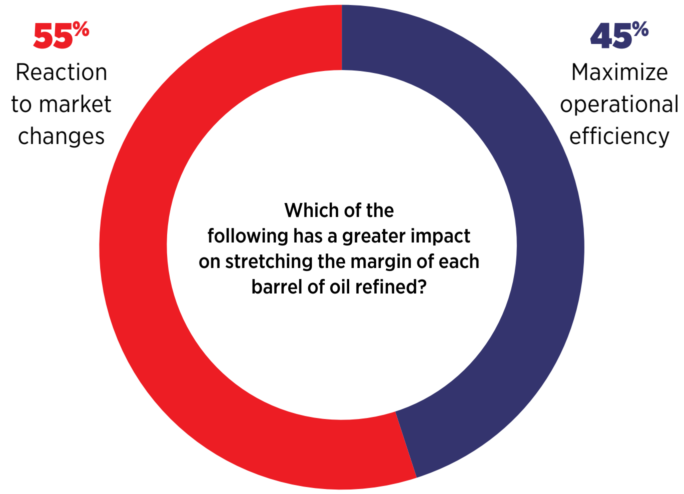
Source of Whitepaper Findings

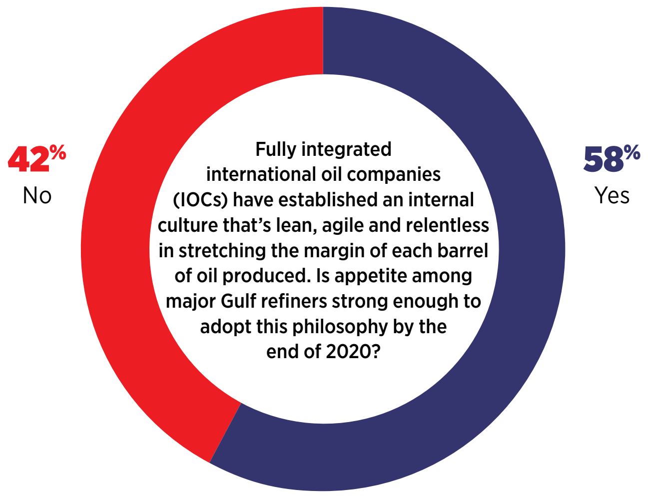
The Workshop encompassed the views and expertise of more than 40 high-level downstream operators. The sessions were conducted in early December in Bahrain under an Open Mic policy and the Chatham House Rule; both to encourage openness and sharing of information. Shared recommendations – a minimum of three per participant – were collated into the top three themes, as detailed in this Whitepaper. Further use of material must cite this Whitepaper.

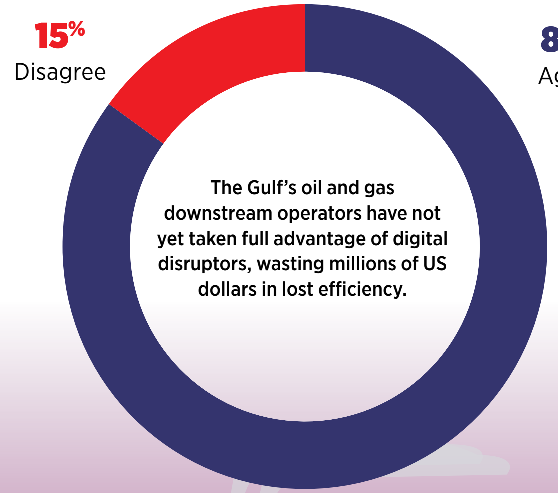
GIQ

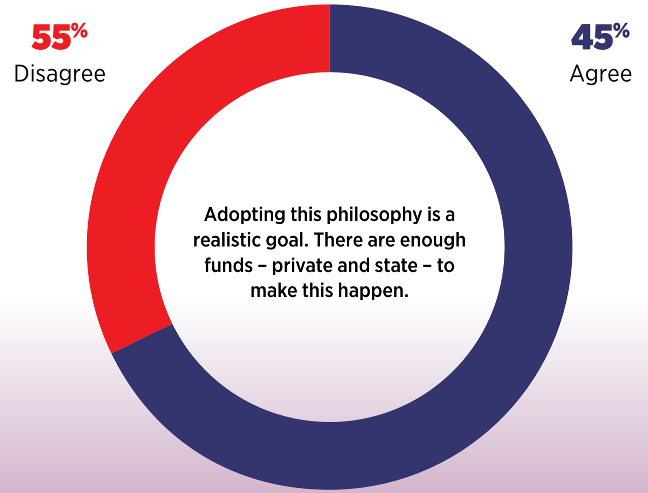
SURVEY

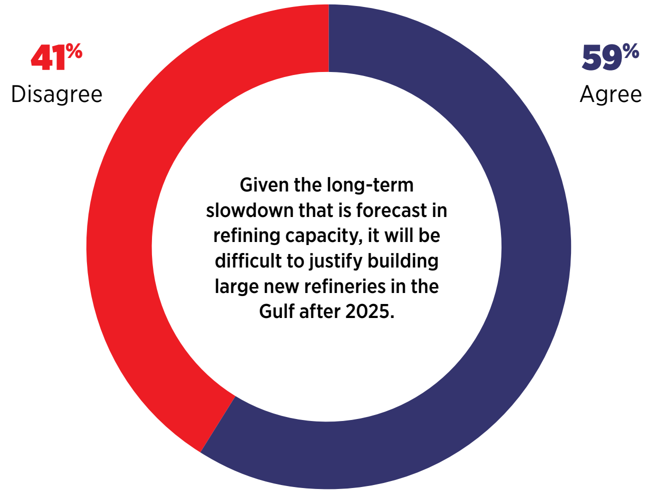
How Should Refiners Place their Bets in the 2020s?

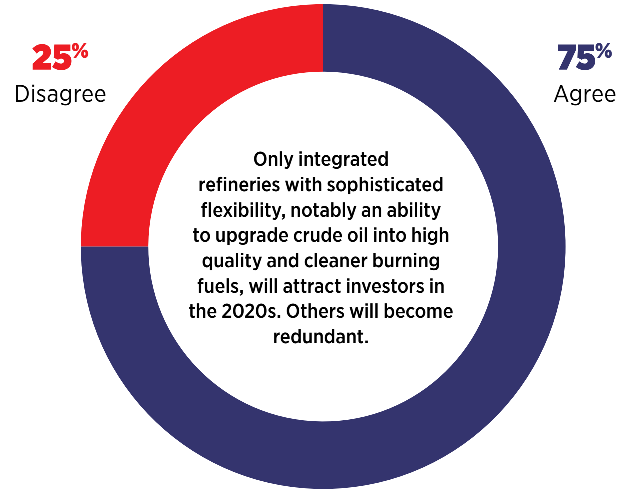






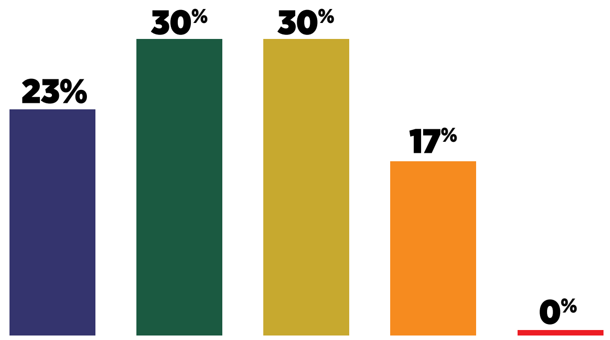






From a score of 1-5, how would you score Gulf refiners' performance in preparing for IMO 2020?

A. 1 *(not prepared)*
B. 2
C. 3
D. 4
E. 5 *(well prepared)*



STREAM 1
Top Three Recommendations

What are the Top 3 Strategies to Improve Efficiency and Utilization?

1. Talent: Optimize Operations, Improve Reliability

A tool is only as effective as the worker directing it. So, optimizing operations to bolster utilization means going back to the beginning of the value chain: talent. Heightening the quality of knowledge and critical thinking within a workforce means proactive decision-making saves expensive failures and downtime periods. For a region rich in highly educated individuals, there is still a shortage of skills for hire. This weakens refiners' ability to 'lead locally', which would support nationalization goals. Refiners must make careers more appealing i.e. sustaining high salaries, an ability to opt-out of offshore stints and offering professional advancement, notably in digital skills. In the world's 12 largest economies, 120mn people (equivalent to nearly a third of the entire population of the Middle East and North Africa) may need to be reskilled because of automation over the next three years, according to an IBM study in 2019. Local refiners must keep pace, as illustrated by the majority of respondents to a GIQ Industry Survey at a GDA roundtable event in November 2019, titled 'Work of the Future and the Future of Work.' A resounding 82% said Gulf refineries must accelerate their adoption of the 4IR toolbox to have shorter turnarounds. Improved talent would also streamline maintenance processes, therefore improving reliability and cutting unnecessary expenditure. Historically, maintenance and reliability have been considered and managed separately. Going forward, refiners must ensure they have the talent to create seamless corporate management processes for a centralized system i.e. rolling maintenance and reliability into one. This cohesiveness will help identify the cause-and-effect in maintenance, which may be hampering reliability, far quicker and accelerate operational optimization.

2. Build Local Synergies

Unity is an effective shortcut. For one, coordinating shutdowns would reduce sudden production pressure on any one refinery (such spikes trigger price volatility). The same applies to feedstock availability and improving intermediate stores. For example, the shutdown of a 70,000 b/d diesel hydro treatment project means storage must be found for that volume for the duration of the downtime. Often, the majority can be stored on site or offshore. But another option is putting extra supply into a nearby market and selling it directly at a competitive price, avoiding the third-party trader. This works vice versa too, for when the partner refiner has downtime and needs to offload their volume without suffering financially. A consistent process via synergies ensures greater reliability, giving refiners breathing space to work on further improving efficiency and boosting utilization. Creating a local synergy also saves expenditure by cutting out the middleman. For example, buying and selling vacuum gas oil (VGO) via a trader, as is currently the normal practice, is more costly than bilateral agreements between refiners. Plans for the GCC integrated electricity grid illustrate the value of cross-infrastructure and cross-border cooperation within an energy market. But conversations around establishing the grid have lasted decades; refiners cannot wait that long.

3. Leverage Digitalization i.e. Predictive Analytics

Embracing digitalization can unlock seemingly endless benefits for refiners. It pays to learn about the 4IR. Interconnected emerging technologies can generate $50bn in savings in the global oil and gas sector alone. Artificial intelligence (AI), blockchain, robotics, sensor technology, machine learning, deep learning and edge computing can cut capital expenditure by 20% and operating costs in downstream by 1%-3%, detailed McKinsey. Predictive analytics are fast emerging as a key focus for refiners. They help maximize the availability of assets, enable identification and critical planning for upcoming faults, as well as improve the accuracy of forecasts (the latter is pivotal to investors' decision-making process). Digitalization is an inescapable part of refiners' future and some are making headway. For example, Saudi Aramco's premises in Dhahran have been remodelled into a 4IR Centre for a targeted focus on cutting-edge digital technology. But cultural change is still underway. Three quarters of Middle East CEOs across all industries see the speed of technological change as the most significant threat (rather than benefit) to their organizations, revealed PWC's 22nd Annual Global CEO Survey in 2019. Refiners cannot make this mistake. ■

STREAM 2
Top Three Recommendations

What are the Top 3 Strategies to Plan for Uncertainties?

1. Curate an Agile Culture

Historically, refiners have been somewhat spoiled. Cheap oil, vast land availability and government funding support have benefitted all. But the margins of ease are rapidly narrowing. Cheap oil is largely no more, demand is soaring, international competition is intensifying, pockets of geopolitical strife remain, plus climate change brings new meteorological uncertainty. So, the industry must bolster its agility and flexibility, from processes to business outlooks so that it surfs (not drowns) amid the unpredictable pressure points. One driver in this adaptation will be the young workforce (millennials) who tend to be more intellectually agile than older generations (baby boomers). Merging this intellectual agility and experience and wisdom, respectively, will be vital in crafting a culture of innovation and adaptability while managing risk. The refining industry is generally slow to big changes. So, a cultural revamp – i.e. heightened innovation and digitalization – means adopting a 'show, don't tell' approach to get downstream leaders and investors on board.

2. Enhance Collaboration and Partnerships

It is simple: just talk more.
Communication is critical to bolstering collaboration, which in turn is essential to countering uncertainties. As the adage goes: several brains are better than one. To kick- start change, establishing local 'clusters' of refineries and associated professions within a 60km radius of your refinery can be explored in 2020. From meeting face-to-face to digital 'chats' (when integrated data systems automatically update), sharing knowledge and ideas is vital to hedging against the unknown in the 2020s. Better communication means the financial toll of unexpected downtimes can be offset by a neighboring refiner, while sharing ideas about how to improve operations can prevent two research and development (R&D) teams at two refineries spending funds on exploring the same challenge. Collaboration is improving within refining companies, but cross-company and cross-border collaborations are generally weaker.

3. Bolster Flexibility Along the Value Chain

Optionality: this is essential to building more flex into refiners' operations so they can better cope with uncertainties. For example, buying feedstocks on both the spot and short-term market, building alliances with other operators to coordinate shutdowns, improving intermediate storage and talent enhancement. This extends to reviewing how refiners configurate their projects and processes. For example, do they need to ally with a licensor to see what further enhancements can be made on their existing asset? To further cushion against uncertainties, refiners should not limit themselves to having one customer or focus on one region. Choice is crucial in a market where the geographic supply-demand dynamics are ever-changing. This means broadening refiners' horizons, notably to Africa, which the IEA expects to have greater oil consumption up to 2040 than that of China. The business case will show that it is worth the spend. Back up plans are a good idea – always. ■

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