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WHAT DO OIL AND GAS COMPANIES DO NOW?

MITIGATING THE RISKS IN AN UNCERTAIN MARKET

PRESENTED BY:

KEVIN SMITH AND STEPHEN GEORGE

CHIEF COMMERCIAL OFFICER AND CHIEF ECONOMIST

If you read the press these days you know that there is no shortage of theories pertaining to the price of oil and the associated impacts to the overall market. For all those whose crystal ball is working and are confident in the prediction of the future of the oil price, we wish you the best in your lucrative and early retirement. For everyone else, it's not a matter of certainty but a focus on playing the odds. In order to safely risk your money in this market, it's important to understand the various scenarios that can play out in the oil market and look for improvement strategies that play the odds on addressing the most likely ones.

The obvious first question is what are the "likely scenarios"? For oil price, there are theories that place us below $10/bbl and a few that put us back well above $100/bbl, but the prevailing thinking is "lower for longer" but not rock bottom for longer. The consensus view seems to be that the price will bounce back from today's price of around $30/bbl, but not back to anywhere near $100/bbl for those who might be holding out hope. While not the forecast that most of us in industry are hoping for, it does provide a platform from which many in the industry can still be profitable if they manage the operations well. For product pricing, the near future most likely sustains continued healthy gasoline pricing but weaker pricing for other products, meaning that for many refiners their margins are not optimal but they are still making money with the potential to make more if they are able to optimise refining yields.

In order to have a view on what actions to take in response these scenarios, it is important to first look at the key market drivers behind them, and based on those drivers start making business decisions that play the odds. This paper and the KBC paper series that will follow over the coming weeks and months will stay on top of the market and the challenges and opportunities presented by market conditions, as well as delving into more detail as to how to address some of those challenges and opportunities.

Overview of Key Market Drivers

As the history of the Oil and Gas industry tells us, things will change, and forecasting the future is more about understanding the various drivers in the market at any given time and thinking through the different market scenarios that will result from those drivers. While we've recently published our current perspective on the market and the impacts to companies in various market sectors, below are the key drivers we are watching. We will continue to update our published perspectives. While there are some direct connections between crude oil and product pricing, the industries face different challenges and we have separated the drivers below.

Drivers for Crude Oil Pricing

1. Supply/demand balance - Global surplus production of around 1.5 million bpd means that the market is 'flooded with crude'. However, the downward pressure that is pushing prices below levels sustained by production fundamentals (e.g., costs) means that we will likely see global production start falling off fairly soon unless something else happens to reverse pricing trends.
2. Lack of action by OPEC - Since November 2014, the "what will OPEC do" question has dominated industry discussions. As OPEC and US light tight shale oil (LTO) have been at a standoff on production, OPEC production has risen to a current level around 32.4 million bpd (including Indonesia) as OPEC members push

up output to maintain their independent cash flow and fiscal requirements. This is a key driver on pricing and the flood of oil mentioned in the first point.

3. Financial speculation - It's not news that market traders have as much to do with pricing as actual market fundamentals, so paying attention to their actions and motivations can help predict pricing. A significant increase in the level of short interest in the market since around November 2015, when prices were around $40-45, has fueled bearish sentiment, and prices are falling. However, as prices have tested levels below $30/bbl and then started to rally, they are triggering short covering, which should bolster prices. If this pushes prices back into the mid-$30s, market conditions should start to support sustaining LTO output. If this happens, we will find support for sustained oversupply as the battle for market share vs pricing resumes. Ultimately someone will have to yield, but it is not clear today that this has to be US LTO.
4. US as an Oil Exporter – The end of the US export ban has allowed the WTI-Brent differential to close as US crudes can now command global market prices. This either provides a bit more 'headroom' for US output, or it pressures the Brent price down to the WTI level. As market conditions allow the WTI price to rise a few dollars to close the gap with Brent, marginal US LTO becomes more economic, also sustaining the oil production battle referenced in the first point.

Drivers for Product Pricing

1. Low Oil Prices – the low oil price has proved a strong spur to product demand, especially for gasoline. Global oil demand rose strongly in 2015 and expectations are for continued strength in 2016 and 2017 while prices remain in the current lower range.
2. Gasoline supply tightness – there are a number of factors currently driving up gasoline demand - especially the demand for octane barrels (i.e., reformate, alkylate). Demand for naphtha for petrochemical feedstock and gasoline has also been driving demand for condensate and light ends. These dynamics are providing a good market for European and US refineries to make money and sustain runs at high production levels. However, shifting operations to gasoline-focused production is not always straightforward and requires a reconsideration of operating parameters, crude oil and blending programs. Some new refineries have been designed to maximise diesel production (especially in the Middle East) and will struggle to respond to the current need for flexibility toward gasoline.
3. Distillate glut, especially for diesel - slackening demand growth for diesel in China and Europe, large new Middle East refineries, forthcoming Russian upgrading projects all signal a strong oversupply for distillates for a year or two, which is reflected by current diesel cracks, the rise in Chinese exports and the tendency toward storage of distillates in Europe. This trend is principally around diesel and gasoil, as demand for jet fuel remains quite strong.
4. Fuel oil glut – So- called Chinese "teakettle refineries" – small, private refineries that typically refine residue feedstocks – have recently been permitted to import around 1 million bpd of crude oil, which is leading these refineries to reject fuel oil feedstocks. This is driving a global glut of fuel oil that will reduce when Russian upgrading projects are completed, but that will in turn tend to drive the distillate surplus. Realistically, only run cuts or a recovery in distillate demand can lead the products market back to balance.

Drivers for Product Pricing

While every company has a unique combination of market drivers impacting its operations thereby creating a unique set of challenges and opportunities, there are some common themes worth exploring. As with our continued vigilance and reporting on market conditions, we will continue to look for and report out on common themes in the coming weeks and months. The themes below are not intended to be an all-encompassing list but a highlight of some of the key challenges/opportunities.

1. Maximising field value (Upstream Production): In the years leading up to last year's plunge in oil price, the high oil price drove a focus on production with cost of product a distant secondary consideration. In the current market, this is a luxury that can no longer be afforded and for companies to remain viable in challenging market conditions their attention must be turned

toward optimising the margin per barrel of production. While the details vary for each company, some of the key factors to be addressed are:

a. Optimising the Cost of reliability
b. Optimisation of overall value chain (for vertically integrated organisations)
c. Risk Control
d. Organisational efficiency, including managing the "crew change"
e. Balancing Field and Asset Management and Optimisation

2. Optimising Yield Mix (Downstream Production): A significant market opportunity exists for refiners who are able to better align their yield mix to current market demand to address the supply and demand imbalances. While significant yield shifts will likely require at least a minor level of capital investment, many facilities still have room for improvement through better operation of their assets. Single refineries that have already invested in a mix of upgrading facilities will have greater flexibility for yield shifts while other organisations with a mix of facilities can optimise their network through integration and improved logistics. Whether a single 'merchant' refiner, a major NOC, or global player with mixed assets, maximising margin through yield optimisation is only possible through: optimisation of the entire refinery as a single asset or optimisation of the mix of refining, petrochemical and midstream assets as an integrated system with the associated logistical challenges. For the more complex asset mix, system optimisation is best supported by integrated facility-wide simulation modelling and application of supply chain modelling technologies. Supporting this optimisation effort, some of the key factors to be accounted for to capture identified optimisation opportunities are:
   a. Hydrocarbon supply chain optimisation
   b. Asset integration
   c. Operational and production planning effectiveness
   d. Key data in the hands of the correct decision makers
   e. Operator production management capabilities
   f. Maximise on-stream time, optimise shutdowns and minimise slowdowns
   g. Molecular management through application of advanced technologies

3. Addressing the Growing Skills Gap (Full Market): The exit of operational experience and expertise from the market is nothing new as it has been on everyone's radar for at least the last 5 years. (The Big Crew Change) Today the challenges created by this exodus of skills from the market are being exaggerated by staffing reductions being made throughout the industry. The impacts are highlighted by the need to operate both more efficiently and more effectively in order to capture the full value of an asset in the market. The need for effective shift team performance has never been more critical. High functioning shift teams directly impact production optimisation, unit availability, and the ability to reliably meet production targets. Opportunities in crude selection as well as product portfolios can be sub-optimised by capability gaps in the control room as evidenced by poor handling of changing operating conditions. In addressing this skills gap there are several factors that need to be assessed and addressed regardless of your position in the market:
   a. Integration of Smart Tools into operations management practices
   b. Application of accelerated capability development methods
   c. Alignment of performance expectations and support for operations teams
   d. Development of future leaders at the site level

4. Keeping an Eye on Safety (Full Market): In the last two decades there has been a revolution in terms of plant safety within the Oil and Gas industry resulting in safety records that were unimaginable previously. However, any time the basic human needs associated with job security are threatened you will see the risk tolerance of individuals change, and it is imperative that organisations take action to make sure that safety performance is maintained when individual focus is shifting to job security in a market environment experiencing dramatic reductions in staffing. The key factors in balancing an on-going focus on safety with the operational needs of the organisation in the current market are:

a. Recognition and communication of the linkage between safety and business objectives (such as unit reliability and availability) at all levels in the organisation
b. Creating an environment where safety is valued as an integral part of all aspects of the job and not something separate or extra
c. Understanding that safe operations affect not only the facility, but have a major impact on the surrounding community and are part of the site's "license to operate"
d. Production management capability of operational staff (see point 3 above)
e. Alignment of Production targets defined in Unit Scorecards to process safety limits (Operating envelope and Integrity Operating Window)

5. Business Model Optimisation (National Oil Companies): A unique challenge is presented to national oil companies (NOCs) and the business models they have been running for years. Specifically, a business model focused on balancing social responsibility for job creation against operating costs will struggle in the current market environment. In order to remain both viable in the market and effective at supporting the macro-economics of their nations, NOCs need to shift their business models to better align with the structure and practices of highly performing organisations in the private or publically traded sectors. For NOCs willing to make this shift to ensure their long term success, the key factors for consideration are:
   a. Alignment of the organisational structure, roles and responsibilities to corporate objectives
   b. Effective manpower loading to optimise performance
   c. Work practices effectiveness and alignment
   d. Organisational capabilities and transition support
   e. Elimination of silos within the organisation and between business units to harness the full capabilities the business and the supply chain

Conclusions

The question remains, "What does all of this mean to operating companies in the industry?" The answer is both complex and unique to every operating company. In order to determine the answer for your facility, you need to understand the true state of your business and organisation, the specific market opportunities and challenges impacting your market space, and you need to take a position on what will happen in the market in the years ahead. Armed with this view, you can plot a path forward to navigate both the market and your organisation in order to define an overall optimisation plan that drives business performance not just for today but sets you up for market leading competitiveness in the months and years to come. With that said, immediate actions should focus on driving business performance balanced against a continued focus on safety while building the capabilities needed to sustain long term performance. Recognising this sounds like a difficult to impossible set of objectives. In reality this is quite achievable assuming you take a balanced approach to addressing your specific issues and challenges, leveraging solutions that are practical for your organisation. As noted previously, in the coming weeks and months KBC will be publishing a series of articles addressing specific issues and opportunities, as well as providing updates on the market direction. In the meantime, KBC is always happy to discuss these perspectives in more detail. Stay tuned for additional insights and perspectives.

About KBC

KBC Advanced Technologies is a leading consultancy and software provider to the global hydrocarbon processing industry. With over 30 years of experience, KBC combines industry leading technology with experienced engineers and operations personnel using robust methodologies to create personalised, sustainable solutions for its clients.

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