Challenges in the New Energy World

By Diane Munro

The international oil market has undergone a paradigm shift since the advent of cutting-edge technology used in the development of nonconventional shale oil in the United States. The game-changing technology that holds the potential to increase both oil and gas supplies has effectively altered the industry's trajectory from one of ever rising oil prices and growing supply scarcity to one more driven by advanced technology that will expand global supplies much further into the future.

Setting the Stage

The groundbreaking technology that near doubled U.S. oil production in seven short years has ushered in a largely unforeseen period of lower oil prices over the past two years, which has had profound repercussions on the economic policies and geopolitical agendas of the Gulf states and oil producing countries around the world. The industry's long-held narrative of steadily rising oil prices against a declining resource base that is increasingly more difficult and expensive to develop propelled oil prices to $100 per barrel (bbl). This injected massive revenue flows to oil producing countries in the Middle East embarking on major projects to diversify their economies and meet the needs of their growing populations. The unexpected plunge in oil revenue over the past two years has wreaked havoc on government budgets and made implementation of projects and reforms more challenging and, at the same time, more urgent. The governments of the Gulf Cooperation Council states and other oil producing countries in the region are tackling the daunting task of reassessing and rewriting their strategies in an era of lower oil revenue to achieve sustainable economic growth; but success is far from certain.

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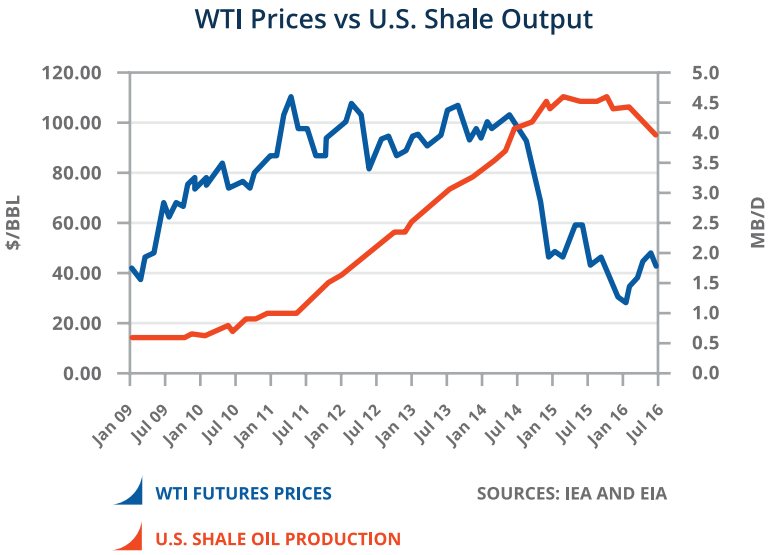
The technological breakthroughs, which combined horizontal drilling and hydraulic fracturing, made viable previously uneconomic vast resources of tight oil locked in low permeability, deep geological formations. Initially, this was thought to be a disruptive technology unique to the U.S. oil sector and sustainable only when prices were hovering around $80/bbl. However, the same relatively small U.S. independent producers that pioneered the shale oil revolution rapidly adapted to the lower oil price environment with more advanced applications of the new technology for better drilling and field management practices, which have sharply reduced costs and increased recovery rates to levels unimaginable in the early days of development. The fast-evolving technology reversed the long decline in U.S. oil production and nearly doubled output from 38-year lows of 5 million barrels per day (mb/d) in 2008 to almost 9.5 mb/d in 2015. Shale, also called tight oil, provided 90 percent of the increase.

The impact of rising U.S. shale oil production on market dynamics was initially muted by an OPEC-engineered cut in supplies when oil prices plummeted in response to declining demand during the great recession from 2008-09. Oil demand growth was flat in 2008 and fell by 1 mb/d in 2009. In response,



OPEC adopted new lower production targets at three meetings in 2008, with production quotas lower by a combined 4.2 mb/d, including a 2.2 mb/d cut effective January 1, 2009 agreed to at the December 2008 meeting in Algeria. Actual volumes cut were, of course, much lower as some members like Venezuela ignored the new agreements. OPEC reduced supplies by 2 mb/d in 2009, and oil prices rose steadily over the year in response, from just over $40/bbl in January to an average $75/bbl by the end of the year.

By 2010, oil demand had rebounded by a sharp 2.8 mb/d as recessionary pressures eased and China's economic engine gathered steam. Global oil demand growth continued to increase by 1.2 mb/d annually through 2014 and by an even stronger 1.5 mb/d in 2015 and the first half of 2016. At the same time, the loss of around 1 mb/d of Iranian supplies following implementation of new U.S. and EU sanctions in 2012 and supply outages in Libya muted the impact of rising shale output. OPEC output in 2014 nonetheless was 1 mb/d higher than the lower 2009 levels but the increase was dwarfed by the surge in U.S. tight oil, which rose by almost 4 mb/d from 2008 levels of around 500,000 barrels per day (kb/d) to a peak of 4.5 mb/d in 2015.

The tipping point came in 2014, when U.S. shale production posted its largest annual increase of 1.25 mb/d, to 3.93 mb/d, and combined with higher output from other non-OPEC producers, pushed global supplies up by 2.5 mb/d and propelled the oil market into oversupply. After peaking for the year at an average $105/bbl in June, U.S. West Texas Intermediate (WTI) oil futures prices turned lower on rising supplies. By the time OPEC ministers gathered in late November to review the market, the price had fallen to just below $75/bbl.

OPEC's surprise decision to abandon any attempts to rein in production and pursue market share in November 2014 was expected to lead to a shakeout of higher-cost shale producers and a return to an upward price trend by mid-2015. The resilience of shale oil producers to adapt to lower oil prices, however, defied expectations and prolonged the rebalancing of the oversupplied market. Shale oil declined by a modest 40 kb/d in 2015 but total non-OPEC supply increased by 1.4 mb/d as long planned projects came online. At the same time, OPEC ramped up production by 1 mb/d, led by Iraq and Saudi Arabia, which only served to add more unused barrels to burgeoning global inventories. However, by mid-2016 non-OPEC production was trending lower and the relentless rise in global oil inventories slowed markedly. Forecasting agencies now expect non-OPEC supplies to contract by anywhere from 600 kb/d to 900 kb/d for 2016.

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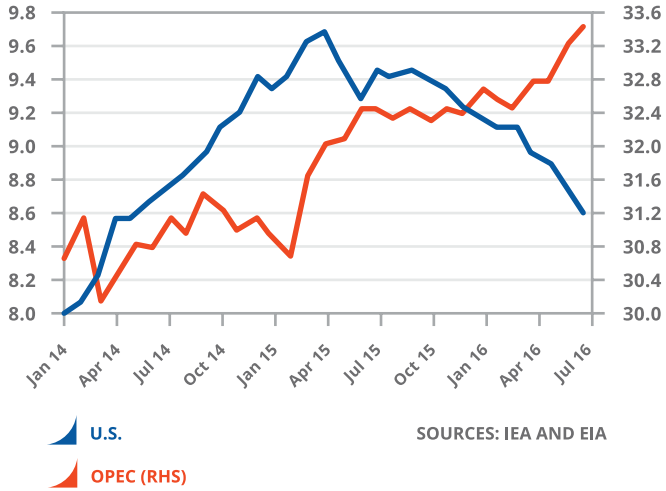
The lower non-OPEC output has come at a steep cost to OPEC, with WTI futures prices in the first half of 2016 averaging just under $40/bbl. OPEC net oil export revenue is expected to fall to about $340 billion in 2016, compared with $404 billion in 2015 and less than half the estimated $754 billion earned in 2014, according to the U.S. Energy Information Administration (EIA). Latest forecasts show a rebalancing of the market taking hold by the end of the year and gathering pace in 2017. Oil prices are forecast to gradually increase to $60/bbl near the end of 2017, according to a recent survey of investment bank oil analysts. But while some shale producers will still be sidelined at those still relatively weaker levels, other companies are already responding to higher prices near $50/bbl by raising production levels.

OPEC has limited options to respond to more technology-driven tight oil production other than to keep output high and prices low enough to hurt the non-OPEC producers. To collectively reduce production, as some members have argued for, would simply cede market share to fast-cycle U.S. shale producers. OPEC announced plans to hold informal talks on the sidelines of the 15th International Energy Forum in Algiers in late September but, after the debacle at the OPEC meeting in Doha in April, analysts have tempered their expectations. However, taking the market by surprise, Saudi Arabia's Minister of Energy, Industry, and Mineral Resources

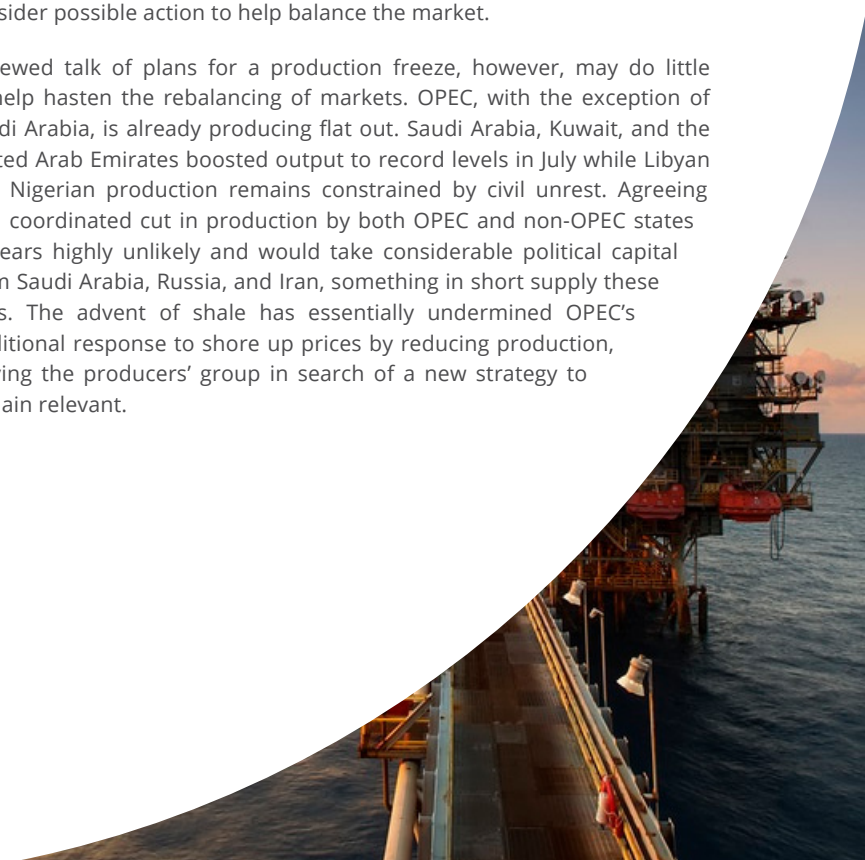
U.S. vs OPEC Oil Production (In mb/d)



SOURCES: IEA AND EIA

Khalid al-Falih in early August signaled his support for a meeting of OPEC and non-OPEC producers in Algiers and said, if needed, the kingdom would consider possible action to help balance the market.

Renewed talk of plans for a production freeze, however, may do little to help hasten the rebalancing of markets. OPEC, with the exception of Saudi Arabia, is already producing flat out. Saudi Arabia, Kuwait, and the United Arab Emirates boosted output to record levels in July while Libyan and Nigerian production remains constrained by civil unrest. Agreeing to a coordinated cut in production by both OPEC and non-OPEC states appears highly unlikely and would take considerable political capital from Saudi Arabia, Russia, and Iran, something in short supply these days. The advent of shale has essentially undermined OPEC's traditional response to shore up prices by reducing production, leaving the producers' group in search of a new strategy to remain relevant.



The Known Unknowns

While OPEC's market share strategy has curbed non-OPEC production in 2016, it has yet to make a dent in the massive buildup in global oil stockpiles that have accumulated since 2014. The oil market now has a myopic focus on a much anticipated rebalancing of oil supplies, and with it a sustained recovery in oil prices above $50/bbl. While there appears to be a consensus that global oil demand will increase annually by 1.2 to 1.4 mb/d to 2020, there are widely divergent views on the outlook for non-OPEC production and the timing and pace of a drawdown in record breaking global oil stock levels. Bullish analysts are projecting a steady drawdown taking hold by the end of 2017 while the more bearish do not see a return to normal levels until at least 2020. Global oil inventories at a historic level of over 3 billion barrels are a key reason why some analysts see oil prices "lower for longer."

The resilience of shale oil producers in the face of declining prices continues to defy market expectations.

While non-OPEC production started trending lower in 2016, industry forecasters are sharply divided on the outlook for 2017 and beyond given the unprecedented cuts in oil companies' spending and capital expenditures. Investments in the oil industry posted the first back-to-back cuts in 30 years in 2015 and 2016, with spending down $300 billion over the two years, according to the International Energy Agency. Meanwhile, consultants estimate anywhere from $600 billion to $1 trillion in future investments have been delayed or cancelled for projects planned for the 2015-20 period. Near term, reduced spending on existing oil field operations for maintaining capacity levels and routine field maintenance is affecting production decline rates and making projections difficult to quantify. Some investment banks and consultants see a further downturn in non-OPEC production in 2017, forecasting declines of 500 kb/d to 1 mb/d.

The resilience of shale oil producers in the face of declining prices continues to defy market expectations. By any measure, U.S. shale oil production would appear to play an outsized role in international oil markets given it represents just under 5 percent of global oil supply compared to OPEC's near 35 percent share. But it is the rapid rise in this new source of supply and its ability to adapt to lower oil prices that has confounded markets. The U.S. EIA, the primary source of data on tight oil, projected in its 2012 Annual

Energy Outlook that output would not even reach 1 mb/d by 2015 and would peak at 1.3 mb/d in 2029 before turning lower. Similarly, in its 2013 outlook shale oil production was projected at 2.6 mb/d in 2015, or almost 2 mb/d below actual levels. Innovative and tech-savvy U.S. producers of tight oil continue to push new frontiers with more advanced application of technology and better drilling and field management practices, making forecasts of cost curves and future production levels moving targets.

By contrast, the outlook for OPEC production capacity increases looks precarious. Many national oil companies are beset with chronic project delays, in part due to a more bloated bureaucratic operating and management structure as well as a lack of technological expertise needed for mature oil field assets. In addition, project developments in Venezuela, Nigeria, Libya, and Iraq, mired in domestic civil unrest and political strife, have been largely suspended. Iran's plans to rapidly increase production capacity following the lifting of international sanctions have been derailed by political opposition to foreign investment in the country and protracted delays in developing a new contract for international oil companies. As a result, Iran's capacity is not expected to reach 4 mb/d until after 2020, let alone its targeted 6 mb/d. Unattractive contract terms for foreign partners have also slowed development of planned capacity increases, with some countries just struggling to bring on enough new capacity to offset decline rates. With the exception of Saudi Arabia and some members struggling with civil unrest, OPEC producers are pretty much pumping at maximum levels now and capacity is likely to remain flat or decline by 2020, leaving some countries marginalized when the market does strengthen.

Indeed, oil markets are historically cyclical in nature, and the sharp reductions in capital expenditures for conventional projects today will eventually lead to a supply shortfall and tighter markets in the future. Whether the recovery in the oil prices takes the form of a sharp rebound or a gradual rise will depend on the pace of the market's rebalancing, rate of non-OPEC production declines, and the ability of OPEC producers to respond with capacity increases, and that is not at all clear given all the known unknowns.

Economic and Political Headwinds

For the GCC states, the protracted low oil price environment has given rise to the mantra "Beyond Oil" and led to ambitious economic, financial, and political reform initiatives that hold the potential to completely change their societies. The GCC states and other oil producing countries long ago recognized the need to plan for a post-oil era, but progress in implementing national reform programs has been slow. Oil producers, who reaped hundreds of billions of dollars in extra oil revenue when prices hovered between $80 and $100/bbl from 2010-14, are now urgently trying to navigate the unprecedented financial crises brought on by oil prices at less than half those levels. Governments in the Gulf Arab states are reducing once sacrosanct subsidies on electricity, gasoline, and water and slashing spending on new projects to stem the rise in growing budget deficits in the short term. Indeed, the International Monetary Fund in the spring praised Gulf Arab oil exporters for their efforts to improve government finances in the wake of sharply lower oil revenue. However, longer term, implementation of wide-ranging economic, financial, and legal reforms is needed to develop non-oil industries, public-private partnerships, and a thriving private sector to create jobs. Reducing energy subsidies may help curb domestic oil demand but more aggressive and progressive domestic energy policies are needed, including private investment in renewable energy resources.

Against this backdrop of shifting oil market dynamics and unprecedented economic reforms, the region is struggling with conflict and political turmoil. The Islamic State in Iraq and the Levant poses an overarching problem for the region while the civil war in Syria has further strained regional relationships and the flow of refugees adds stress on neighboring countries like Jordan and Lebanon. Domestic political turmoil in Iraq continues to destabilize the country, especially in the country's northern Kurdish region. Meanwhile, Iran's meddling in conflicts in Yemen, Syria, and Iraq has worsened the already frayed relationship between Riyadh and Tehran. Prolonged lower oil revenue may exacerbate increased political instability in the region and lead to more oil price volatility.

The Past is Prologue

In hindsight, what was once considered a disruptive technology unique to the United States is proving to be a true black swan event for the international oil industry with far-reaching economic and geopolitical repercussions for oil producing countries, especially the oil-dependent Gulf Arab states.

International oil companies are now competing with mean and lean smaller U.S. independent shale oil producers that increasingly influence price direction with their short-cycle production increases. IOCs are reassessing their focus on expensive, long-term mega developments or high-risk projects in politically unstable regions and searching for smaller projects in which cutting-edge technology can be implemented to maximize recovery rates and can be monetized in shorter time frames for a more balanced project portfolio.

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Meanwhile, state oil companies face the daunting task of restructuring along the lines of IOCs to improve efficiencies and deliver profits. Some national companies lack the advanced technology and experience needed for the development of mature oil fields, which has led to chronic delays in implementing project developments. Revenue-strapped state oil companies may need to shed their nationalistic approach and reconsider their relationships with foreign partners in order to attract much-needed investment and technology or risk being marginalized in the future. The pressure on state oil companies to deliver increased oil revenue has never been more acute but changing the entrenched bureaucratic government management styles to a market-oriented business approach is fraught with challenges in a region where “go slow” is the norm.

Lower oil revenue has hastened the need for critical economic and political reforms in the Gulf Arab states but threatens to upend the sacrosanct social contracts between governments and their citizens, which are seen as crucial for domestic stability. The financial crisis brought on by lower oil revenue has been made more acute by the sharp increase in expenditures on public salaries and benefits, social programs, and infrastructure that were largely instituted to check potential unrest in the region stemming from the 2011 Arab uprisings. When oil prices were hovering between $80 and $100/bbl governments could afford to increase budgets, but maintaining funding levels in the era of $40/bbl oil has created massive fiscal deficits.

A growing chorus of the region's politicians and industry leaders, however, see the downturn as an opportunity to enact long overdue and crucially needed reforms if their countries are to thrive in a post-oil world. The fiscal pressures brought on by lower oil revenue have already set in motion some long-awaited economic restructuring and reforms of domestic energy policies, but much more is needed.

A generational change in the political leadership in the GCC states has raised hopes that the pace of both economic and political reforms will take on a new urgency but success is far from certain. Saudi Arabia's Vision 2030 may offer a roadmap for other Gulf states but it is far from clear if the goals set out in the plan are achievable in the designated time frame. The lack of institutional capacity to implement the significant market and financial reforms set out in national plans throws into question the ability of the countries to make a successful transition to a "Beyond Oil" era.

The oil industry initially underestimated the impact of shale oil on global markets and failed to foresee the onset of the steep decline in oil prices in mid-2014. The industry's new narrative is still being written but what is certain is that technology-driven shale oil production will play a major role in setting the oil price trajectory for years to come, which will compel oil producing countries to embrace more ambitious reforms in a much shorter time frame. Indeed, the protracted period of dramatically lower oil prices has created a new dynamic in the political economy of oil producing countries that will require an unprecedented level of governmental, institutional, and societal change to achieve sustainable economies in the coming years and decades.

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