

Why OPEC can win the battle against US shale



The current stoush between 'Sheikh and Shale' (as *The Economist* has brilliantly described it) presents the ideal opportunity for an examination of the economics (or otherwise) of shale oil production. I've been a long-time skeptic of the hype surrounding shale oil, as it's high prices over the past few years that have made shale oil viable.

If you listen only to the hype emanating from the USA spouted by brokers, deal-makers, drilling-rig operators and company executives, the economics of shale oil are beyond question. But this is far from the truth. Sure, there has been a tidal wave of new oil produced from various US shale formations over recent years, but the commerciality of this oil has been underwritten by the high oil price environment (+\$100 per barrel) over recent years.

Without high oil prices, this shale oil is in most instances uneconomic – a fact we've been at pains to point out. Effectively, it's high prices that have made shale oil viable.

The danger has always been that that if production surges (as it's done over recent years due to the plethora of US drill-rig owners cashing in on the fracking boom), the resulting production glut would drive down prices and render many shale producers uneconomic.

And this is exactly what we're seeing in the latest data cited by Bloomberg. In a recent article titled *Steepest Oil-Rig Drop Shows Shale Losing Fight to OPEC*, journalist Lynn Doan highlights the fact that US drillers have taken a record number of oil rigs out of service during the past six weeks, at the same time as OPEC sustains its production.

The oil rig count has fallen by 209 since December 5, which is the steepest six-week decline since Baker Hughes (BHI) began tracking the data in July 1987. The count was down 55 in just one week alone to 1,366. Horizontal rigs used in US shale formations that account for virtually all of the nation's oil production growth fell by 48, the biggest ever single-week drop.

The Permian Basin of Texas and New Mexico, the largest US oil field, lost the most rigs this week, declining by 15 to 487, Baker Hughes data shows. Rigs in Texas' Eagle Ford formation dropped by 12 to 185, whilst the Williston Basin (home of North Dakota's prolific Bakken formation), declined by six to 165.

"Analysts including HSBC Holdings Plc say the decline shows that the Organization of Petroleum Exporting Countries is winning its fight for market share and slowing the growth that's propelled U.S. production to the highest in at least three decades. OPEC's decision not to curb

its output amid increasing supplies from the U.S. and other countries has driven global oil prices down 58 percent since June.”

“OPEC’s strategy is working, and it will be obvious in U.S. production by midyear when growth from shale plays will come to a halt,” James William, president of energy consulting company WTRG Economics in London, Arkansas, said by telephone Friday. “You can imagine the impact on any industry from a 50 percent impact on sales.”

Shale oil has significant cost disadvantages

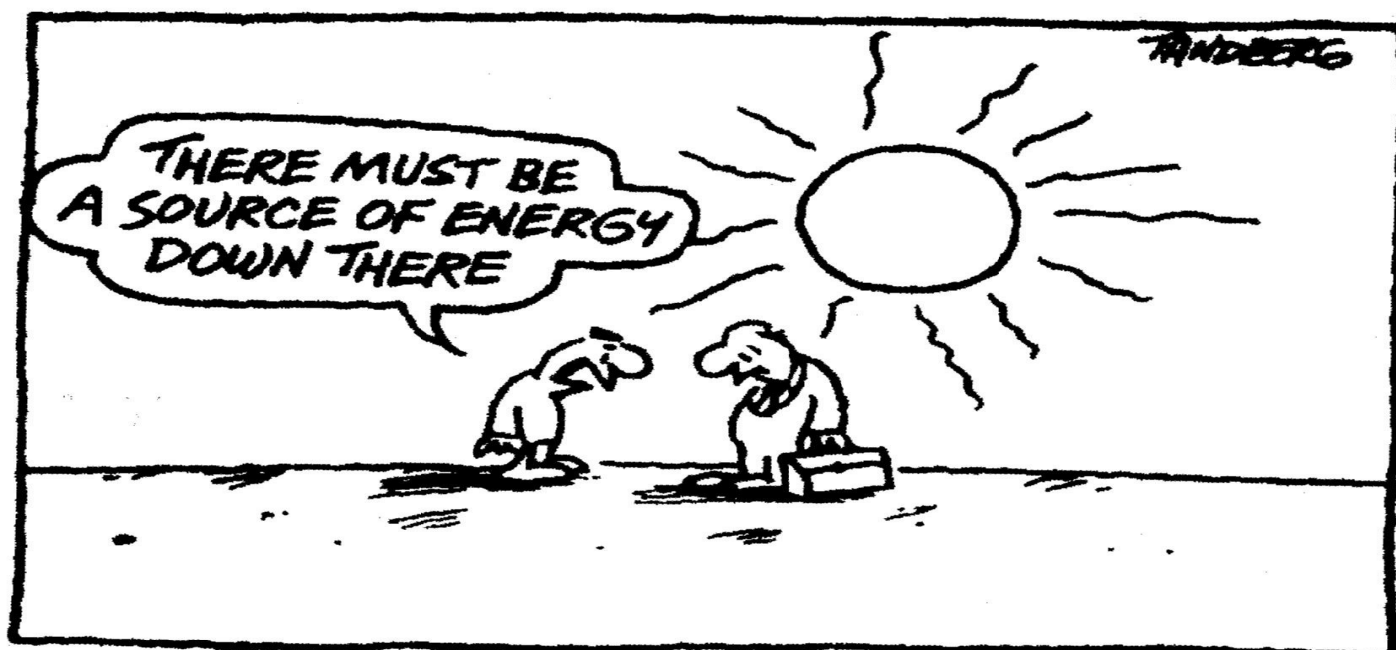
There’s nothing earth-shattering about shale oil – it’s been known to exist for decades. The big change however has been the advance in modern extraction technology, which has made it commercially viable to extract oil from great depths from ‘tight’ reservoirs that typically won’t flow without significant assistance.

But as always there’s always a catch – shale oil requires a high oil price environment in order to survive. The reason is that ongoing operating costs associated with maintaining production from shale oil fields are very high. This is primarily due to the fact that shale oil wells have a very rapid rate of depletion, unlike typical conventional oil wells, where depletion rates are much steadier.

Another significant disadvantage of shale oil production is that hydrocarbons are heavier and thus flow more slowly. The fracking process required to enable the oil to flow ultimately drives up the cost of production (particularly by comparison with conventional oil reservoirs).

What this all means is that shale oil production requires aggressive drilling of new wells in order to keep the oil flowing – which is a very costly business. A business that US drilling rig companies have profited massively from over recent years.

The statistics are stark. Locations within North Dakota’s Bakken Shale are losing 85% of their capacity within a few years. Industry experts Global Sustainability estimate that the US will need to drill 6,000 new wells per year at a cost of \$35 billion just to maintain current production rates. Accordingly, it estimates that by 2017 the US will hit its maximum production levels and ultimately return to 2012 production levels. Given the necessary time, difficulty and cost, shale production break-evens within the USA can range anywhere between \$60 and \$80 per barrel. At current oil price levels this is clearly unsustainable – a situation being borne out in the drastically falling drilling-rig rates cited earlier in our discussion.





Art Berman, a well-qualified shale critic.

You won't have heard of him, but US geologist Art Berman is one of the most outspoken critics of the shale gas revolution. Based on the US Energy Information Agency's (EIA's) own data on US shale gas resources, he concludes that there is only about eight years worth of supply left in the ground - far less than forecast by EIA, which projects dramatic increases in production at least through 2040.

According to an article on Berman's contrarian claims, he "recently studied one area that has been actively drilled for several years and found that between 25% and 30% of the wells drilled that are five to seven years old are already sub-commercial."

On the other hand, industry typically claims up to a 40-year lifespan for new wells, highlighting a very large potential discrepancy. Many of today's wells don't, according to Berman, even cover lease and operating expenses because their production has already fallen too low.

Berman estimates that the average annual decline in the first five years for shale gas is between 30% and 40%, compared to about 20% per year for conventional wells. This means that every three years, the entire shale gas production resource needs to be replaced.

Berman also concludes that the commercially viable area of most natural gas fields is around 10% to 20% of the geographic area. If Berman is even close to being right, the very crude model that the EIA uses to project natural gas production will be well wide of the mark. This is because the EIA projects future production based on geographic area and well density in that area.

But if historical production data comes from the 10% to 20% of the area that is the best producing area, the "sweet spots" as it were, it will not lead to accurate extrapolations for the entire area.

Berman adds that shale gas plays are often unprofitable, even when they're producing at high levels, because it costs a lot more to produce shale gas than it does to do so in conventional plays. He has good company in this assessment. Exxon CEO Rex Tillerson has said that "we are all losing our shirts" on shale gas, though he made this statement when natural gas prices were far lower than today.

Berman sums up his view thusly: "We are spending more and more to get less and less." Berman is certainly the loudest critic and also the source of many other critics' information about

EIA forecasts. Time will tell if shale energy turns out to potentially be the biggest 'ponzi' scheme ever created.

OPEC producers are also under margin pressure, but have a greater capacity to ride out the storm, particularly heavyweight producer Saudi Arabia. It simply doesn't make sense for OPEC to cut production as it has in the past in order to try and restrict supply, if at the same time US shale producers also don't implement cuts. Any OPEC cuts would simply provide price support and relief for US shale producers, who are obviously hurting more. OPEC wants to protect its market share.

Impact on Australian oil companies

In terms of the earnings and share market impacts on the key domestic oil players like Woodside Petroleum, BHP Billiton, Santos and Oil Search, when we examine a chart we see an enormous differential. For example, Australia's biggest independent oil play Woodside Petroleum has seen its share price fall by around 15% along with Oil Search, whilst BHP Billiton is down by around 30% and Santos is down by more than 45%.



And you reckon it's cheaper to leave it running all the time?

What this tells us is that all companies are impacted differently and it's therefore hard to generalize about the impact on oil price falls on the sector. For example Woodside has only been modestly impacted because it generates a sizeable chunk of its earnings from LNG. Furthermore, its share price had taken a battering over the previous 12 months for various corporate reasons, so the stock was coming off a rather low base.

PNG-based Oil Search has also not been as dramatically affected, mainly due to the fact that it's quite a low-cost oil producer and is also diversifying its income stream into LNG. BHP Billiton has a significant shale oil exposure and the cost of producing oil from shale is typically higher than from conventional oil fields. BHP's share price has also been impacted by falling oil prices. Santos is by far the worst affected because it has quite a high debt burden as a result of its heavy exposure to Queensland coal seam gas and export LNG.

Conclusions

In terms of the oil sector generally, the only certainty is that oil prices will inevitably rise again. Prices at these sorts of price levels around \$50 a barrel are unsustainable over the medium to longer-term for most producers within the oil industry. In my view prices of at least \$80 a barrel and probably close to \$100 are required to cover all-in costs of most producers, including exploration and investment in new fields and infrastructure.

Whilst we as motorists and consumers are enjoying the current low oil price environment, this situation will inevitably lead to higher prices in the long run. Exploration for new oil fields is a hugely expensive and risky business and companies will only be incentivized to explore if the returns justify the enormous outlays. Likewise, investment is constantly required in maintaining and revitalizing production infrastructure, whilst also funding new production infrastructure for new oil fields.

Low oil prices now mean that spending to identify new oil discoveries will likely be delayed or even abandoned, disrupting the future flow of oil to market and likely leading to significant price spikes in the future. This is a pattern that's been repeated through many cycles within the oil industry.

Shale oil extraction and production is difficult and costly, which ultimately drives up the cost of production compared to more conventional oil deposits. Given the necessary time, difficulty, and cost, shale production break-evens within the US can range anywhere between \$60 and \$80 per barrel. At current oil price levels this is unsustainable.

The logo for 'minelife' is displayed in a bold, sans-serif font. The word 'mine' is in black and 'life' is in white, both set against a yellow rectangular background.

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Put simply, strong underlying oil prices have encouraged the advent of shale energy and are continuing to facilitate its sustainability. Whilst shale can produce vast new volumes of oil, this comes at a cost – and a robust underlying oil price is necessary for its commerciality. Rather than driving down oil prices, shale’s commerciality is as a direct result of strong existing oil prices. I believe that the current low oil price environment cannot last and that after a period of price consolidation, we will begin to see oil prices climb during H2 2015.