

Oil & gas macro outlook

Oversupply short term, lower break-even long term

The oil markets have been in turmoil now for 16 months, with January 2016 trading the most tumultuous we have seen in years. Crude prices have plummeted to levels not seen since mid-2004 and both slowing Chinese demand growth and Iranian exports are weighing heavily on the market. We align our short-term forecasts to the EIA, which does not expect a reversal in inventory builds until H217. This reduces our forecasts for Brent in 2016 and 2017 to \$40/bbl and \$50/bbl respectively. Longer term, a fundamental shift in costs is likely to result in a lower break-even for marginal cost producers; this sets the base for our long-term oil price assumption. As a result, we reduce our long-term Brent assumption from \$80/bbl to \$70/bbl.

Oversupply to remain in the short term

Barring a reversal of the Saudi-led OPEC market share protection strategy, it appears highly likely that the global supply glut will continue for at least another 12 months. The US Energy Information Administration (EIA) in its recent Short-Term Energy Outlook does not expect inventory draws until mid-2017 at the earliest, and ongoing cost deflation that continues to keep marginal economic fields in production could extend this supply overhang further. Reduced Chinese demand growth and the impact of lifting sanctions on Iran are adding to the oversupply fears and downward pressure on prices.

2016/17 forecasts: Going with consensus

Given the volatility in the oil markets and considerable uncertainty to macroeconomic trends we could see in 2016/17, we feel it prudent to align our short-term assumptions with that of the global agencies. A continued supply overhang over the next 12 months is likely to result in reduced prices for at least the next two years. We adjust our assumptions to the latest EIA forecasts for Brent of \$40/bbl in 2016 (from \$60/bbl) and \$50/bbl in 2017 (from \$70/bbl). The EIA does not expect prices to start to increase markedly until H217 once the supply overhang potential starts to unwind.

Long-term assumption reduced to \$70/bbl

The oil price collapse since H214 has driven material cost deflation through the industry, some of which may never be recovered. Rystad Energy has estimated that break-even prices for marginal producers have fallen c 15-25% during 2015 and this trend is likely to continue into 2016. Our own research indicates offshore projects can already be executed for full-field costs 20% below the levels of 2014, with further cost deflation expected in 2016. Against this backdrop, we expect there will be a structural shift in the market to lower break-even prices. Given our approach of setting our long-term oil price assumption around an economic return for the marginal producer on the global supply curve, we consequently move our long-term Brent assumption from \$80/bbl to \$70/bbl.

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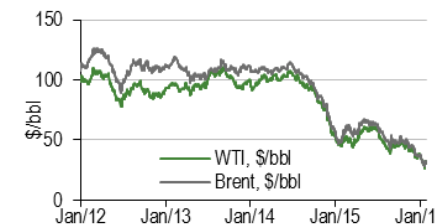
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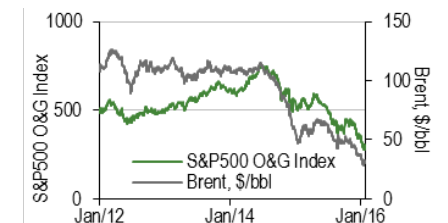
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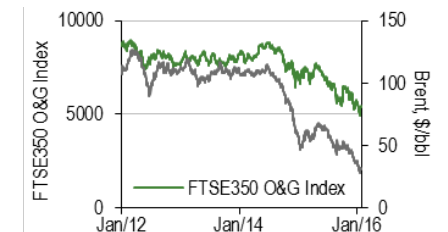
WTI vs Brent



S&P 500 Oil & Gas Index



FTSE 350 Oil & Gas Index



Source: Bloomberg

	WTI \$/bbl	Brent \$/bbl
2013	98.0	108.8
2014	93.2	99.1
2015	48.7	54.2
2016e	38.5	40.0
2017e	47.0	50.0

Source: EIA, Edison Investment Research

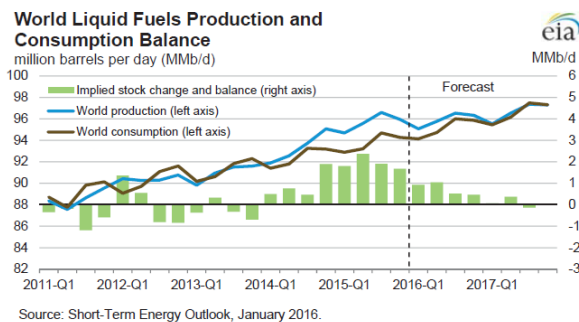
Crude oil price short-term outlook

Market thesis: Oversupply to remain in the short term

The oil markets have been in turmoil now for 16 months, with recent trading at its most tumultuous in years as crude prices have plummeted to levels not seen since mid-2004. A Saudi-led OPEC market-share protectionist policy has driven a marked increase in inventories over 2015, with lifting of Iranian sanctions and potentially slowing Chinese demand set to extend the supply overhang.

The US Energy Information Administration (EIA) in its recent Short-Term Energy Outlook (STEO) forecasts that, having run at an average of 1.9mmb/d during 2015, this inventory build is likely to continue with an additional 0.7mmb/d supply overhang in 2016. Based on this analysis we are not likely to see a reversal of this trend for at least another 12 months, with stock reduction only envisaged from mid-2017 onwards (Exhibit 1).

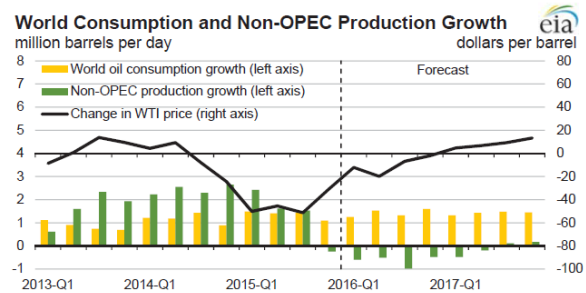
Exhibit 1: World liquid fuels production and consumption balance



Source: Short-Term Energy Outlook, January 2016.

Source: EIA STEO, January 2016

Exhibit 2: OPEC surplus crude oil production capacity



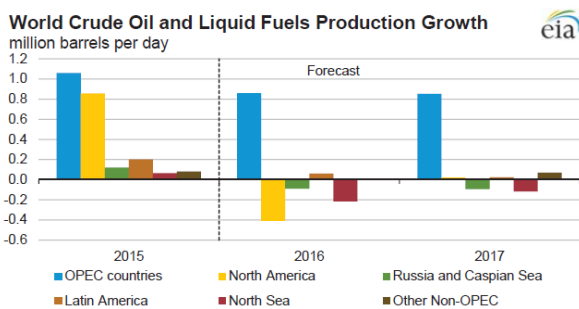
Source: Short-Term Energy Outlook, January 2016.

Source: EIA STEO, January 2016

This is despite non-OPEC countries reigning in investment that the EIA expects to result in a marked decrease in non-OPEC production in 2016 (c 0.6mmb/d) and relatively flat global demand growth of c 1.4mmb/d (Exhibit 2).

The reason for a growing inventory overhang, and depressed prices, is of course due to continued production from OPEC. Including non-crude liquids, this grew 0.9mmb/d in 2015 to 38.3mmb/d, with the EIA forecasting an increase of 0.9mmb/d in 2016 and 0.9mmb/d in 2017 (Exhibit 3).

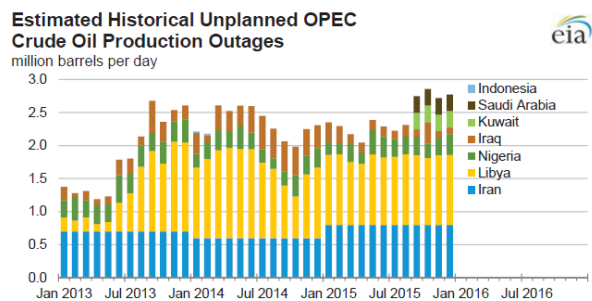
Exhibit 3: World crude oil and liquid fuels production growth



Source: Short-Term Energy Outlook, January 2016.

Source: EIA STEO, January 2016

Exhibit 4: Estimated historical unplanned OPEC crude oil production outages



Source: Short-Term Energy Outlook, January 2016.

Source: EIA STEO, January 2016

Libya and Iran form the majority of this potential additional supply, as shown in Exhibit 4. The EIA is estimating that with recent international sanctions being lifted on Iran, this could immediately add a

further c 0.7mmb/d onto the global market. We caveat this, however, given some reports that some of this capacity could already be being exported through neighbouring countries, while there are conflicting reports of the capacity and time that it will take Iran to increase production after years of sanctions.

2016/17 outlook: Going with consensus

The short-term oversupply outlook is clearly going to continue to add downside pressure to oil prices over 2016 and 2017. While we recognise that there are sensitivities to the views presented here (predominantly using EIA data), we do not claim to have more insight than the global agencies and hence for prudence we propose to align our near-term (2016/17) forecasts with those of the agencies. The EIA published its Short-Term Energy Outlook on 12 January 2016 and hence we use these data for our current assumptions. These forecasts for Brent and WTI are shown in Exhibit 5 and Exhibit 6 respectively.

Exhibit 5: EIA STEO January 2016 Brent 2013-17 quarterly forecasts \$/bbl

	Q1	Q2	Q3	Q4	Average
2013	112.8	102.9	110	109.4	108.8
2014	107.9	109.8	102.2	76.4	99.1
2015	53.9	61.6	50.4	43.5	52.3
2016e	36.4	40	41.7	42.3	40.1
2017e	44	47.7	52	56.3	50

Source: EIA STEO, January 2016

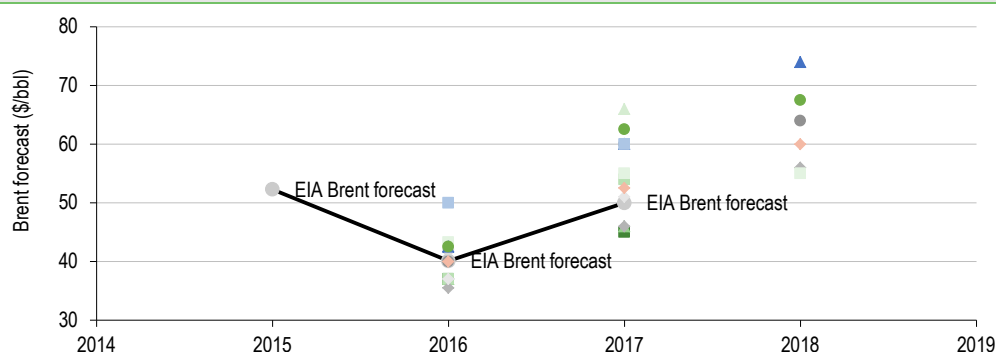
Exhibit 6: EIA STEO January 2016 WTI 2013-17 quarterly forecasts \$/bbl

	Q1	Q2	Q3	Q4	Average
2013	94.3	94.1	105.8	97.6	98.0
2014	98.7	103.1	97.6	73.2	93.2
2015	48.5	57.9	46.5	41.9	48.7
2016e	36.4	38.0	39.7	40.0	38.5
2017e	41.0	44.7	49.0	53.3	47.0

Source: EIA STEO, January 2016

As a sense-check to EIA forecasts, we have also considered the consensus numbers from research published on Bloomberg. Based on forecasts updated since end 2015 (to take into consideration recent market turbulence), we see that EIA forecasts are broadly aligned with Bloomberg consensus (Exhibit 7).

Exhibit 7: EIA forecasts vs research analyst estimates



Source: Bloomberg, Edison Investment Research

Sensitivities: 'Lower for longer' or a 'structural bounce'

We have aligned our assumptions with EIA forecasts as the complexity and current volatility of the oil markets does not support independent analysis. However, we recognise there are compelling reasons for both bulls and bears to argue for different assumptions.

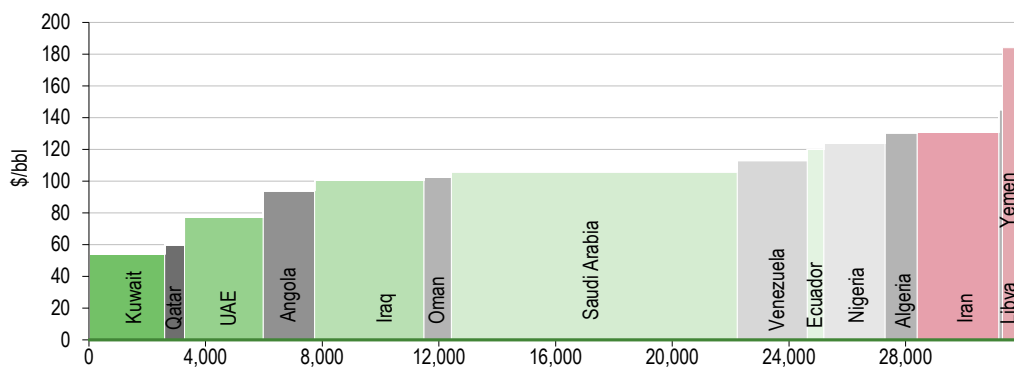
'Lower for longer': Some analysts (including Goldman Sachs, Morgan Stanley and RBS) called a \$20/bbl bottom in December 2015 after a recent OPEC meeting did not agree any production cuts. This is based on break-even cash costs for highly levered US shale producers before production has to be shut-in. We would not fully support this view with many high-cost producers in the US likely to have higher break-even prices than this, although the sentiment has logic. The US service industry in particular has been very responsive, driving down costs to keep many marginal fields still economic at lower oil prices.

As well as exacerbating the supply glut and keeping prices depressed, the service cost deflation that we have seen during 2015 and into 2016 both provides a window of opportunity for oil companies looking to improve project economics and could potentially have a long-lasting impact on the global supply cost curve. We consider the impact of this on long-term oil prices later in this report.

Finally, it is worth noting that Standard Chartered has even pushed short-term oil price forecasts to as low as \$10/bbl, although it states that this is based on financial flows caused by fluctuations in other asset prices rather than oil market fundamentals.

Structural bounce: On the flip side of the above argument, many believe that geopolitical forces simply cannot support sustained low prices. Many OPEC and MENA oil-producing countries require substantially higher oil prices to balance national budgets (Exhibit 8 shows this analysis, albeit with data from March 2015 and will not consider the global cost deflation seen during 2015). We could therefore expect there to either be structural cooperation to combat low prices across the wider market (OPEC and non-OPEC) or risk increased political instability.

Exhibit 8: Fiscal break-even oil prices for key OPEC and MENA oil producers



Source: EIA, Bloomberg, Edison Investment Research. Note: Yemen and Oman are not OPEC members. Production data as of March 2015.

OPEC may also be changing its stance with reports that even this week it has made an appeal to non-OPEC nations (primarily Russia) to work together on supply cuts that would boost prices. However, whether such a wider collaboration agreement is possible is still questionable with many countries both within OPEC and outside probably not in a position to sustain the impact of production cuts on a long-term basis.

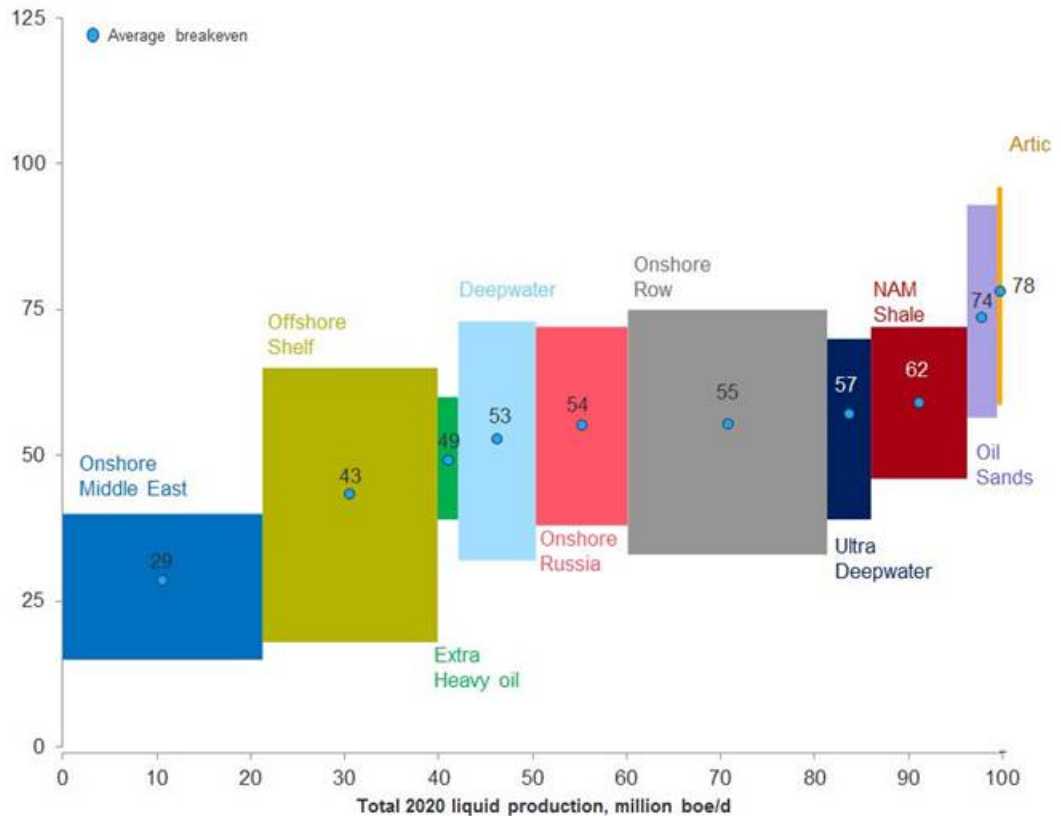
Crude oil price long-term assumptions

We have consistently used a long-term assumption of \$80/bbl Brent as our base case for valuation purposes over the last five years. The basis for this has been a belief that once short-term geopolitical issues are stripped out, this equates to a normal return for the marginal cost producer on the global supply curve. This in turn sets the price that the marginal producer would actively invest in the industry and hence sets the price that the market should be able to tolerate.

As recently as H214 we could defend this view based on the global supply curve data, an example of which we show in Exhibit 9. With expected global demand of c 95mmb/d, this supported a view that the world would require the development of a multitude of different sources of oil from conventional offshore developments (including ultra-deepwater) and North American shale.

Exhibit 9: Global liquids cost curve forecast for 2020

Break-even prices for non-producing assets
Break-even price, USD/bbl



Source: Rystad Energy, November 2014

However, with the sudden and dramatic drop in oil price, we have seen cost reductions across the sector that may never return to 2014 levels. For example, Rystad (which published the above cost curve) estimates that break-evens for marginal producers (eg ultra-deepwater, NAM shale and oil sands) have fallen c 15-25% from early 2015 to October 2015. Development projects continue to be cancelled (reports of between \$200-400bn have been cancelled since the oil price collapse) and we expect this to continue to support further supply cost deflation in 2016, which will further reduce these break-even prices.

Our own analysis of cost reductions across the upstream sector (Exhibit 10) suggests that for typical offshore shelf projects, cost savings of over 20% should already be achievable (from a 2014 base). Again we can expect these savings to increase in early 2016.

Exhibit 10: 2015 cost and cost deflation assumptions

Capex	% of typical offshore project	Deflation* (%)
Subsea equipment costs (SURF)	20%	(provisional estimate) 20%
Engineering	10%	(contractor day rates) 15%
Installation and subsea	17%	(supply vessels and man-hours) 20%
Drilling and well completion	43%	(rig rates) 50%
Process equipment	5%	(materials and man hours Asia yard) 10%
Process facility	5%	(materials and man-hours Asia yard) 10%
Capex cost deflation		31%
Opex		
Fixed opex		
Services and logistics	11%	(contractor day rates) 15%
Maintenance and mods	16%	(contractor day rates) 15%
Man hours fixed	10%	(contractor day rates) 15%
FPSO lease	28%	(based on vessel re-use, SBM expects minimal decline in new-build activity) 5%
Fixed opex cost deflation		11%
Variable opex		
Export	5%	(provisional estimate) 5%
Fuel	5%	(product prices/transport) 30%
Workovers	18%	(equipment rates/man-hours) 15%
Man hours variable	7%	(contractor day rates) 15%
Variable opex cost deflation		16%
Total project opex and capex cost deflation		21%

Source: Edison Investment Research. Note: *Deflated from 2014 costs.

In addition to cost savings, we also expect countries to adopt fiscal change to reinvigorate investment. This again could lower the break-even price for the marginal producer. An early adopter of this approach that we have seen is Cote d'Ivoire, where a recent farm-out deal between African Petroleum and Ophir Energy included a revision to the PSC to reflect *"the current commodity price environment and outlook for development of the deepwater prospects"*. Small changes, but again reflects the evolving environment to what is probably a lower break-even industry.

Long-term base case Brent assumption dropping to \$70/bbl

While we would expect to see cost inflation creep back into the sector once the market moves to inventory draws, in the medium term we do not expect these to increase to 2014 levels. As such, we feel it is prudent to reduce our long-term oil assumptions for modelling purposes and therefore move our base case assumptions as of this report to \$70/bbl Brent. We will continue to embed oil price sensitivity analyses in our research to accommodate investors with more bullish and bearish outlooks than this.

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