EDISON

Oil & gas

Oil & gas macro outlook

Accelerated rebalance

On 30 November 2016, OPEC and select non-OPEC oil exporters agreed to cut output by a combined 1.76mmb/d in 2017, prompting us to review our short-term oil price assumptions. OPEC views this as a necessary catalysis of the rebalancing process to secure medium-term oil supply and the role of crude oil within the global energy mix. Assuming OPEC's 14 members (OPEC-14) and Russia comply with >70% of pledged output reductions in early 2017, we expect global inventories to fall in Q217, reaching the top of their five-year range by the end of 2017. We estimate that OPEC compliance will accelerate crude oil inventory draws by around six months from earlier IEA forecasts (November 2016 oil market report). We maintain oil price assumptions in line with the EIA at $51.7/bbl in 2017, rising to $70/bbl (real) long term – minor adjustments from our forecasts in June 2016.

Rebalance pulled forward by six months

Supported by a group of non-OPEC oil exporters, OPEC has catalysed the oil market rebalancing process by pledging to reduce output by a combined 1.76mmb/d over the next six months. A monitoring and reporting committee consisting of a handful of member countries is being put in place to ensure compliance across the cartel. Prompt oil prices have rallied since OPEC's announcement, with 12-month spreads reducing by c $10/bbl. A further shift in term structure, moving the market into backwardation, will require OPEC and non-OPEC adherence, as well as sustained positive demand trends from India (strong Q316 imports) and China (recovery in October PMI).

Implied volatility remains high

Despite pledges to reduce output from 25 countries, uncertainty over short-term oil prices remains high. The exact timing and magnitude of production cuts, elasticity of US shale to higher prices and emerging market demand growth all remain key uncertainties. Our 2017 Brent crude price assumption is in line with that of the EIA December 2016 short-term energy outlook at $51.7/bbl, despite a rally in Brent since the EIA publication. Oil price uncertainty remains high with the 95% confidence interval for December 2017 Brent ranging from $28.6/bbl to $94.4/bbl. We expect the market to keep a close eye on OPEC tanker exports, Russian output, US onshore activity levels and global PMI data over the next six months.

Long-term assumption unchanged at $70/bbl

Our approach remains to set our long-term oil price assumption around the economic return for marginal developments on the global supply curve; on this basis we maintain our long-term Brent assumption at $70/bbl. While this assumption is based on 2016 costs, we recognise that further cost deflation could reduce project break evens but equally a recovery in OFS pricing power and margins over the medium term could drive an upwards shift in the cost curve.

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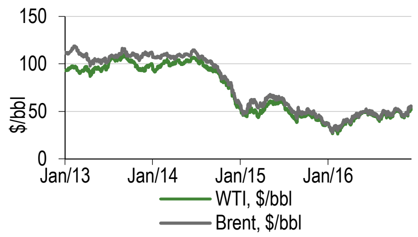
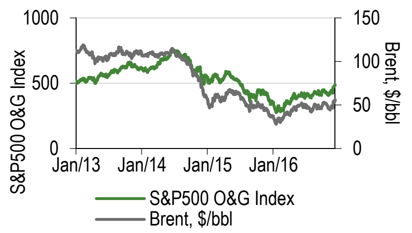
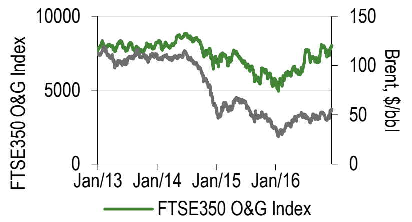
WTI vs Brent



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	43.1	43.5
2017e	50.6	51.7

Source: EIA, Edison Investment Research

Crude oil price short-term outlook

OPEC action leading to accelerated re-balance

OPEC production cuts were first tabled in Algiers, September 2016, with suggestions that Saudi Arabia was shifting from a policy of defending market share to protecting price, at least in the short term. The cartel intimated that catalysis of the rebalancing process in 2017 would secure medium-term crude supply and oil as a key component of the future energy supply mix.

The Algiers accord was formalised at the cartel's 171st meeting at the end of November, and supplemented with the addition of an agreement with several non-OPEC oil exporters to deliver a combined reduction in crude output of 1.76mmb/d: a combined reduction equivalent to 1.8% of projected 2017 global demand. In addition to the production adjustments in the table below, non-OPEC producers Azerbaijan, Kingdom of Bahrain, Brunei, Equatorial Guinea, Kazakhstan, Malaysia, Mexico, Oman, Sudan and South Sudan have committed to reduce output by a combined 258mbopd in addition to Russia's 300mbopd commitment.

Exhibit 1: OPEC and Russia agreed production adjustments (mbopd)

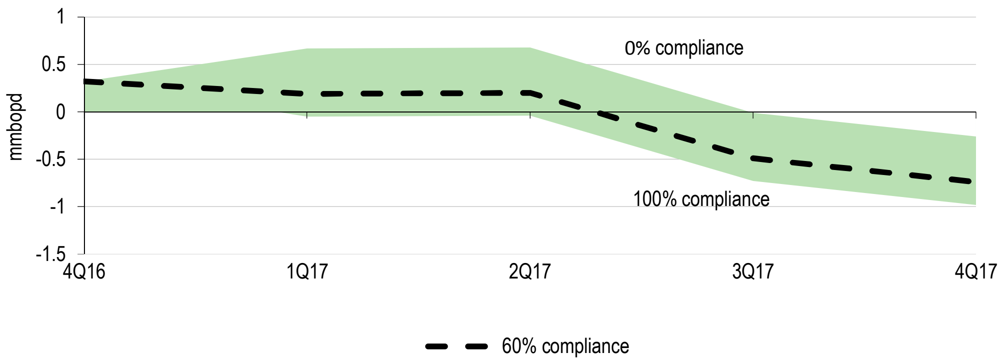
Member country	Reference production level*	Adjustment	Production level effective 2017	Change
Algeria	1089	-50	1039	-4.6%
Angola	1751	-78	1673	-4.5%
Ecuador	548	-26	522	-4.7%
Gabon	202	-9	193	-4.5%
Indonesia**	722	0	722	0.0%
Iran	3707	90	3797	2.4%
Iraq	4561	-210	4351	-4.6%
Kuwait	2838	-131	2707	-4.6%
Libya	528	0	528	0.0%
Nigeria	1628	0	1628	0.0%
Qatar	648	-30	618	-4.6%
Saudi Arabia	10544	-486	10058	-4.6%
UAE	3013	-139	2874	-4.6%
Venezuela	2067	-95	1972	-4.6%
OPEC-14	**33846**	**-1164**	**32682**	**-3.4%**
Russia	11205	-300	10905	-2.7%
Total	**45051**	**-1464**	**43587**	**-3.2%**

Source: OPEC, Edison Investment Research. Note: *Reference base is October 2016 production expect Angola where September 2016 is used. **Indonesia suspended membership as it is a net oil importer.

Production adjustments have been agreed for six months and are extendable by a further six depending on market conditions. Brent crude has rallied 17% since 30 November, but the sustainability of higher prices will depend on producer compliance with proposed cuts as well as how unconstrained producers respond to higher prices. Importantly, we expect OPEC to test the elasticity of US shale supply over H117.

Our analysis suggests that OPEC intervention has brought forward the point at which oil markets start to re-balance in 2017 by approximately six months. The IEA's November 2016 oil market report forecasts a draw-down in inventories in Q317; we believe this has been brought forward to Q117 assuming 100% compliance (OPEC-14 and Russia) or to Q217 assuming 60% compliance (in line with historic OPEC compliance with cartel quotas).

Exhibit 2: Global crude oil inventory expected build/draw



Source: IEA, Edison Investment Research

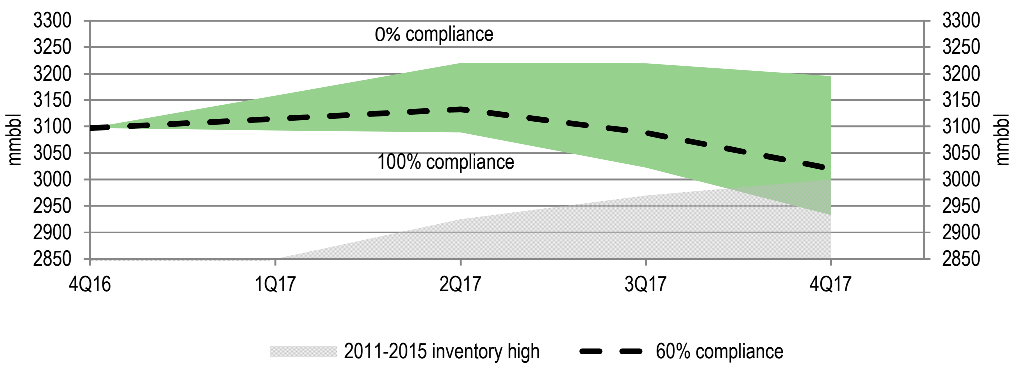
Global crude inventories remain at multi-year highs and well above average levels seen for this time of year.

Exhibit 3: Total oil stocks (crude and product) relative to five-year range

Source: IEA (November 2016) , Edison Investment Research

Assuming OPEC-14 and Russia compliance with pledged production cuts in the 70-100% range we expect inventories to draw down to within the 2011-2015 average range by Q417, depleting a 300mmbbl stock overhang.

Exhibit 4: Global total oil inventories and OPEC-14/Russia compliance

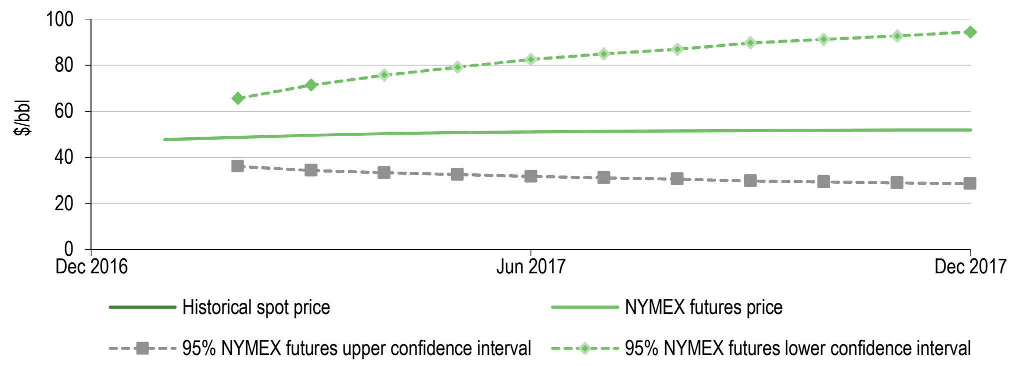


Source: IEA, Edison Investment Research

We expect physical market participants to keep a close eye on OPEC crude exports (tanker movements) and Russian output to gauge the pace of and commitment to proposed production cuts. In addition, we expect the market to keep a close eye on US onshore activity levels as oil prices recover. US rig count recovery has been relatively subdued to date in absolute terms, but a 17$/bbl recovery in price is likely to spur investment. Nevertheless, restrictions on lending to the oil and gas sector may act to limit US supply elasticity in the short term.

Given the uncertainties, it is unsurprising to find that the implied volatility of future oil contracts through to the end of 2017 remains near record highs suggesting a December 2017 95% confidence interval for WTI from $28.6/bbl to $94.4/bbl and 68% confidence interval (one standard deviation) $38.3/bbl to $70.3/bbl (see Exhibit 5).

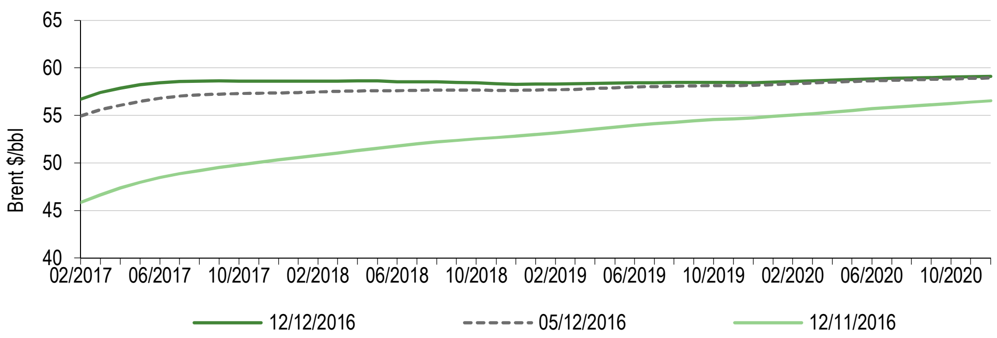
Exhibit 5: WTI 95% confidence interval



Source: EIA, Edison Investment Research

Term structure: Shift towards backwardation

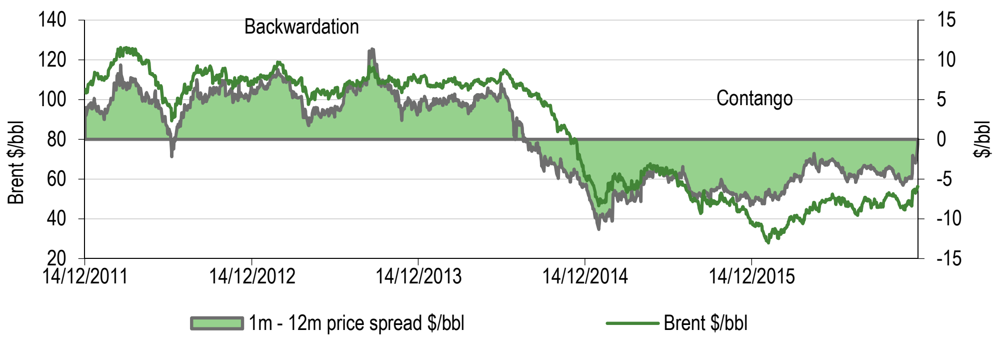
Exhibit 6: Brent forward curve prior and post 171st OPEC meeting on 30 November 2016



Source: Bloomberg, Edison Investment Research

Over the last month, the crude oil market shifted from a steep contango towards backwardation, implying strong prompt demand and a price premium for immediate delivery. Crude oil is clearly not in short supply, but this rally in the front end is likely to have been driven by a myriad of reasons including speculation, an influx of index fund money at the front end, reduced concern over storage constraints, physical buyers more willing to take short-term price risk and the fact that OPEC supply response is limited to a six- 12-month period. In addition, producers hedging further out along the curve as well as contango-driven storage unwinding is likely to have accelerated flattening of the forward curve. Strong OPEC and non-OPEC compliance with pledged cuts in Q117 could see the curve move back in to backwardation for the first time since August 2014 (1m to 12m price spread).

Exhibit 7: 1m-12m Brent price spread

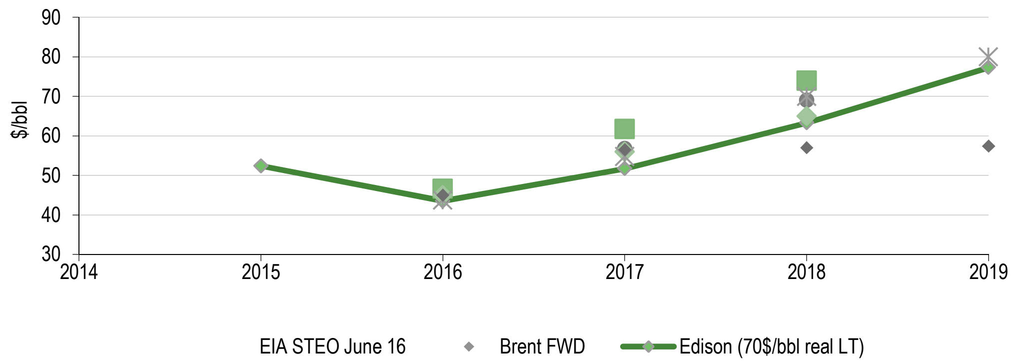


Source: Bloomberg, Edison Investment Research

2017 base-case outlook: Sticking to EIA forecasts

We maintain our alignment with EIA oil price projections for 2016 and 2017. The EIA published its *Short-Term Energy Outlook* on 6 December 2016 and we use this data to drive our current short-term assumptions of $43.5/bbl Brent in 2016 and $51.7/bbl in 2017. EIA forecasts are shown against Bloomberg analyst consensus, the forward curve and Edison forecasts in Exhibit 8.

Exhibit 8: EIA forecasts vs research analyst estimates

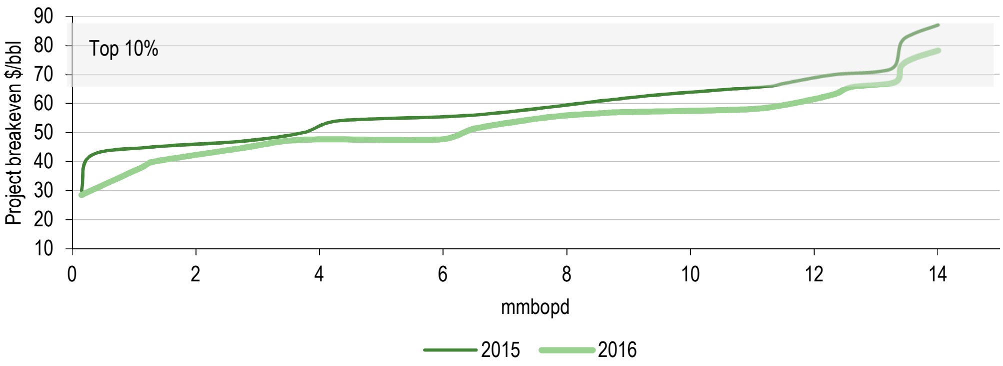


Source: Bloomberg, Edison Investment Research

Crude oil price long-term assumptions unchanged

In the long term, we expect global inventory levels to normalise and OPEC spare capacity to remain below 3mmb/d (c 3% of demand), driving prices back up towards non-OPEC marginal cost. We maintain our long-term oil price assumption at $70/bbl Brent based on a normal return for a pre-FID project towards the top end of the cost curve. Estimates of the breakeven cost (defined as the price at which a development generates zero return [NPV_{10}=0]) for new developments have shifted over time, taking into account new sources of supply (eg US LTO) combined with service sector cost deflation. The cost curve presented in Exhibit 9 uses a combination of company data on project break evens and published cost curves from a range of industry sources. We have shifted our base-case curve down to provide a broad-brush indication of the impact of further cost deflation over the course of 2016 assuming a further 5% reduction in breakeven for onshore projects, 10% for offshore and 15% for US LTO.

Exhibit 9: Global liquids cost curve for yet to be developed discovered resource, FID due over the next 10 years



Source: Various, Edison Investment Research

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