NATIXIS
BEYOND BANKING

US Upstream in Focus - 2017

Dr Abhishek Deshpande

Chief Energy Analyst

Global Markets Research

EnergyRisk Awards 2017 Winner | Natixis Commodity or energy research house of the year

US UPSTREAM REVIEW

2017

NATIXIS

CORPORATE & INVESTMENT BANKING / INVESTMENT SOLUTIONS & INSURANCE / SPECIALISED FINANCIAL SERVICES

EnergyRisk Awards 2017 Winner

Natixis
Commodity or energy research house of the year

CONTENTS

1 INTRODUCTION

2 US UPSTREAM

3 US PRODUCERS

4 FINANCIALS

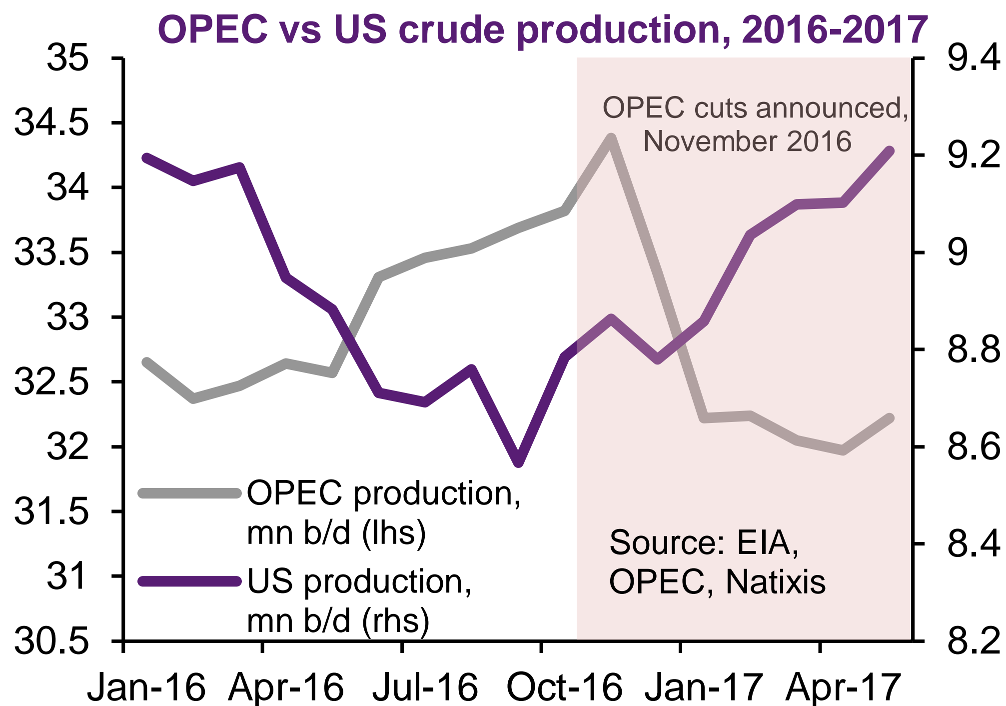
5 CONCLUSION

INTRODUCTION

NATIXIS
BEYOND BANKING

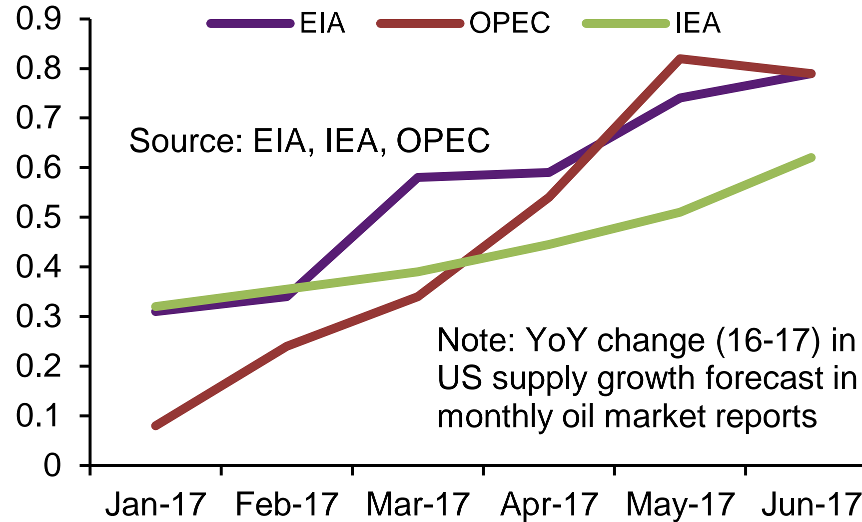
1

US supply growth is one of the big stories in 2017's oil market



NATIXIS
BEYOND BANKING

1 US supply growth estimates have been consistently underestimated by OPEC and the major agencies…



Supply Growth, mn bbl (16-17)	
Natixis	0.90
EIA (Jun-17)	0.79
IEA (Jun-17)	0.62
OPEC (Jun-17)	0.79

1 US Upstream in focus 2017…

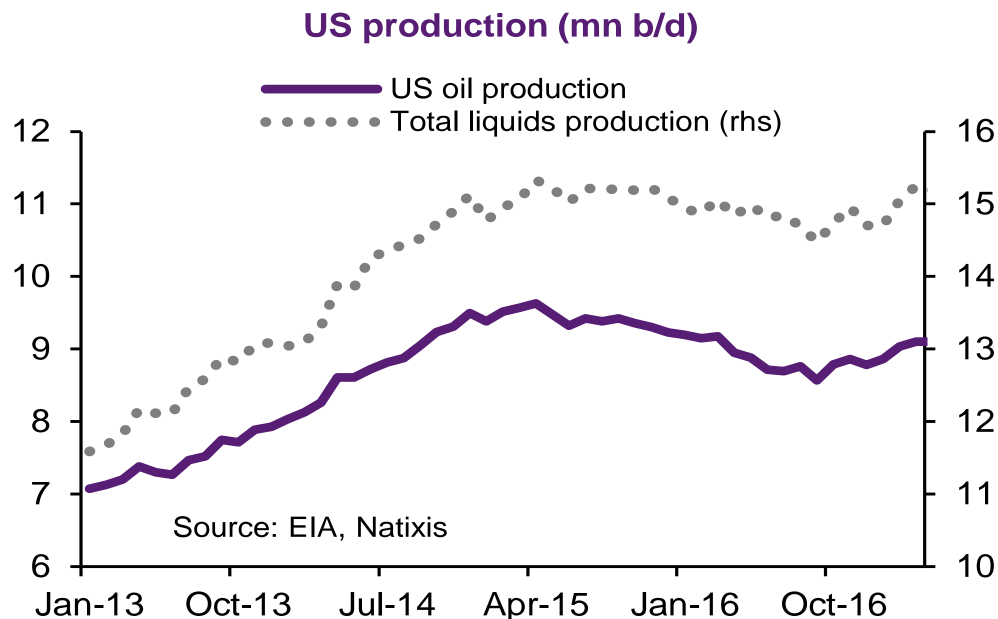
We have attempted to review the sector from a fundamental perspective and a company perspective to quantify US supply growth and the future outlook for the US upstream industry as a whole

NATIXIS
BEYOND BANKING

US UPSTREAM

2 Total US oil production declined YoY by 0.54mn b/d in 2016

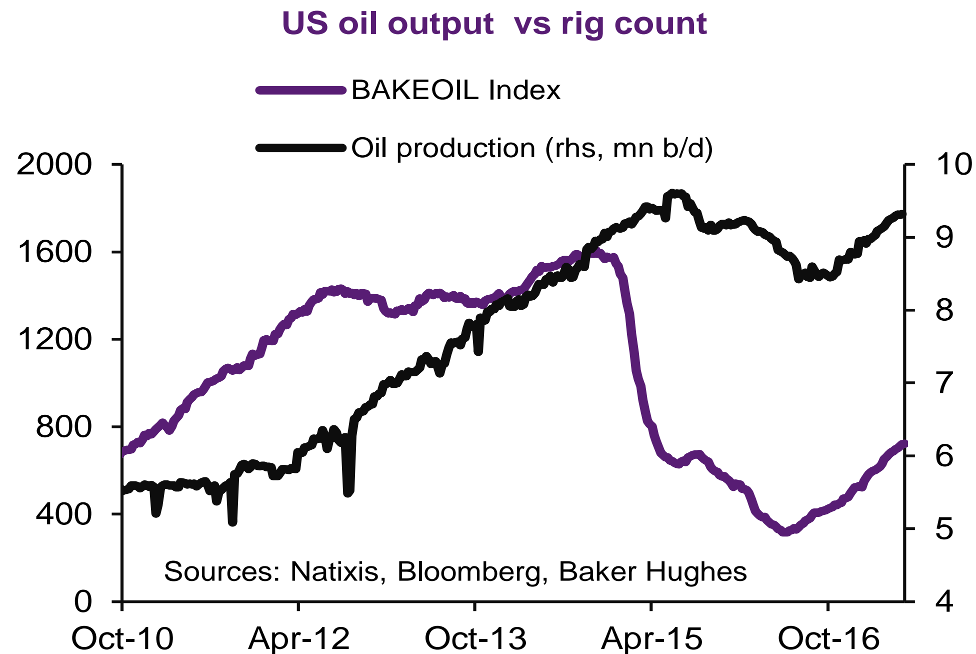
- **Production in May 2017 stood at 9.21mn b/d, a 0.64mn b/d increase on the lows seen in September 2016**



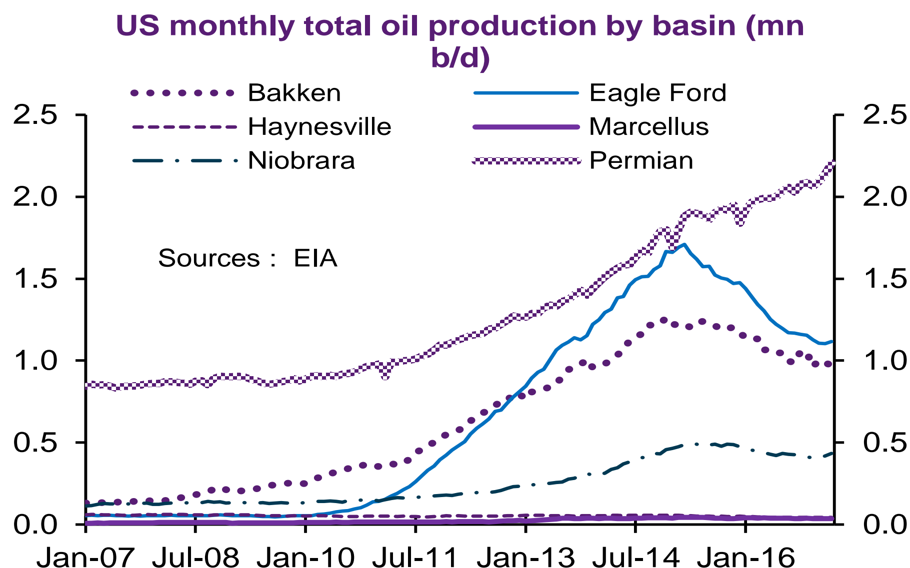
NATIXIS BEYOND BANKING

2 The Baker Hughes oil rig count stands at 733 as of 2nd June 2017, compared to 316 in May 2016

- **Rise continues to be driven by horizontal rigs, with vertical and directional rigs continue to remain at depressed levels**



2 Output growth is being driven by activity in the Permian Basin



Exit change in production (b/d) and rig count

	Bakken	Eagle Ford	Haynesville	Marcellus
2016	(213,299)	(315,349)	(6,523)	(3,000)
Rig Count	(24)	(39)	(4)	(2)
2017Q1	70,494	(9,457)	(354)	1,745
Rig Count	9	33	13	3

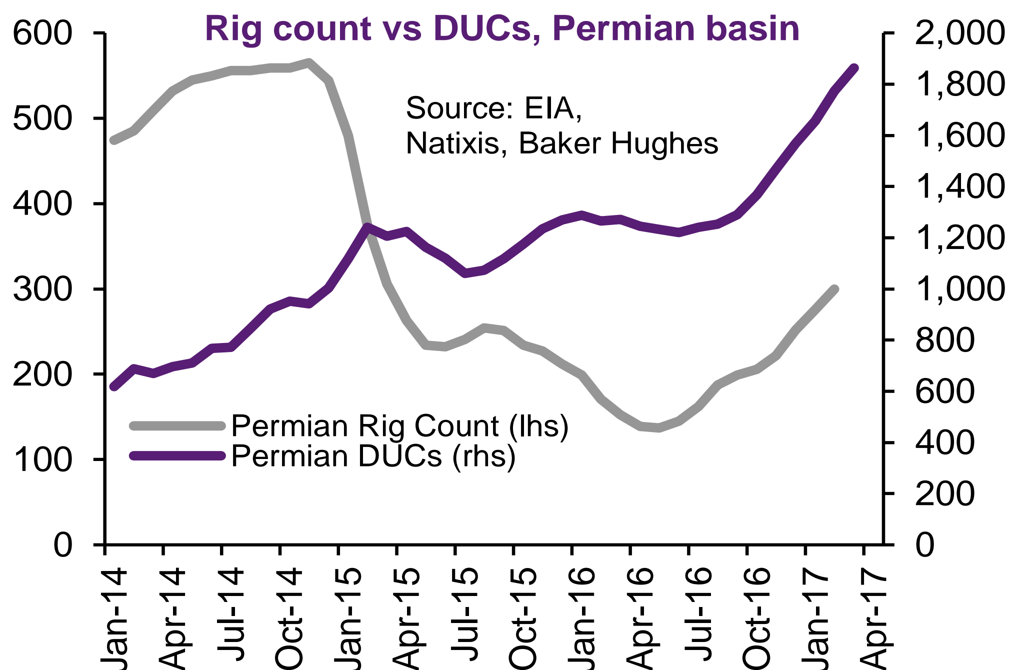
	Niobrara	Permian	Utica	US Total
2016	(56,519)	251,504	(35,025)	(449,707)
Rig Count	6	40	2	(11)
2017Q1	22,081	124,402	5,530	300,829
Rig Count	1	58	3	137

Source: EIA, Natixis

Note: 2016 means "Dec 2016 to Dec 2015" exit change and 2017Q1 means "Mar 2017 to Dec 2016" exit change

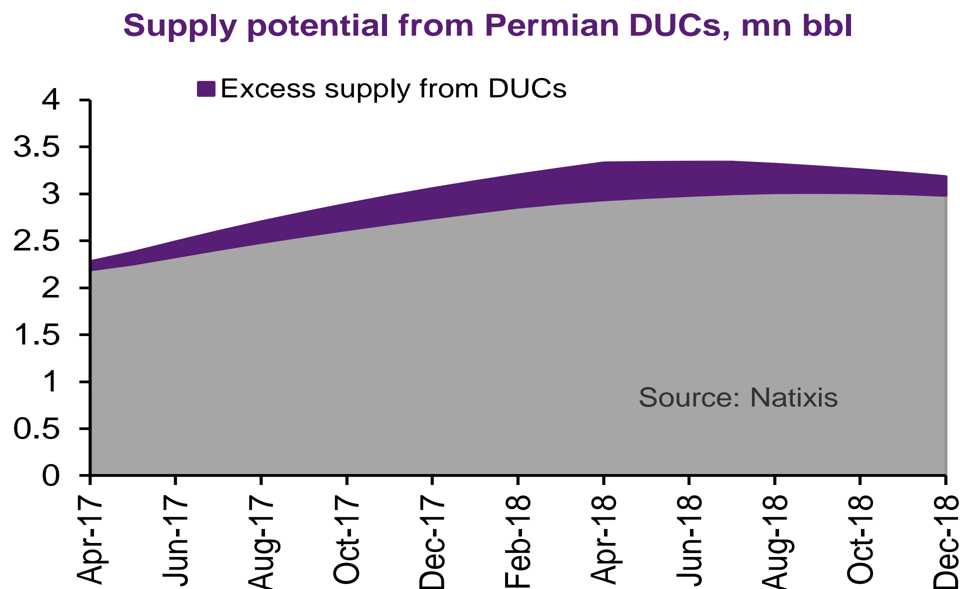
2 Significant volume of DUCs in the Permian

- **There are currently 4581 DUCs in liquids-dominated basins, with 1864 of them in the Permian basin**



NATIXIS BEYOND BANKING

2 Our analysis suggests that DUC wells could add 0.39mn b/d by April 2018



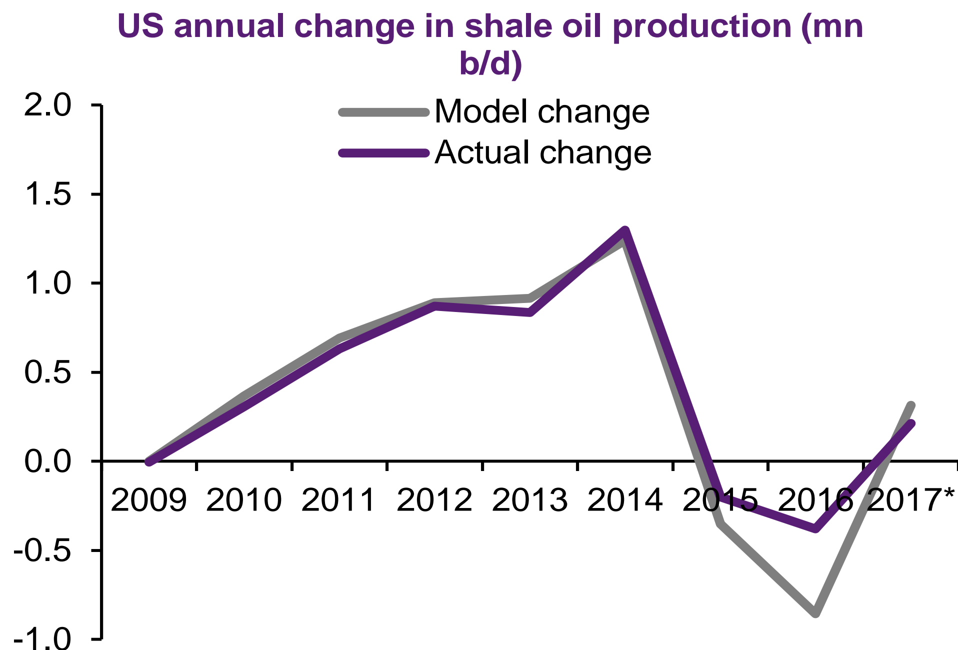
2 Where from here?

- US production has rebounded strongly so far in 2017
- We have used productivity analysis on a basin-by-basin level as well as reviewing production growth from a company level to develop our view looking forward

NATIXIS BEYOND BANKING

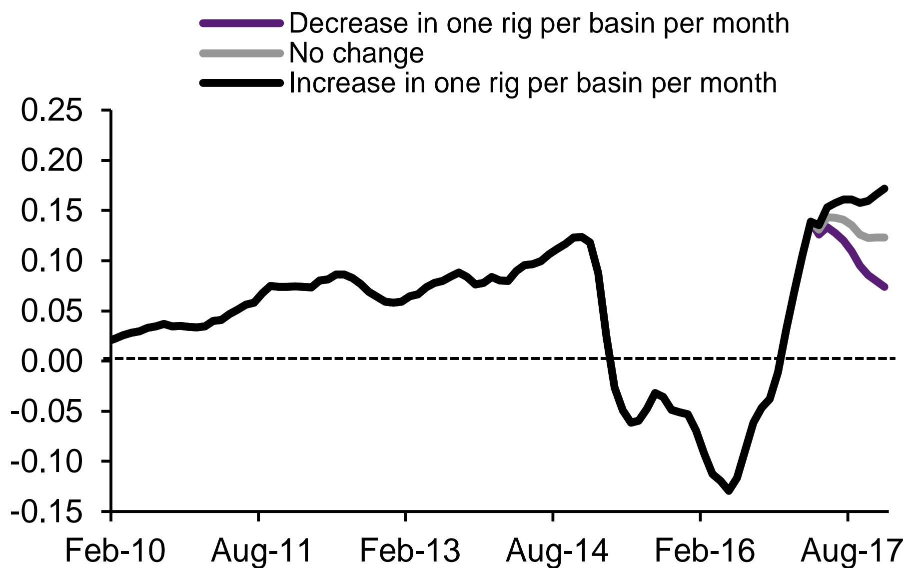
2 Productivity Model

Our production model based on the productivity of the seven main basins in the lower-48 projects a strong growth outlook for US oil production. When backdated, this closely aligns with the actual yearly change in oil production from these regions.



2 Productivity Model

- **Suggests production growth in 2017 of 0.59mn b/d in the base case**



Annual US shale oil production and (average growth) from 7 basins (mn b/d)			
	No rig change since Dec16	Increase in rigs by one per month since Dec16	Decrease in rigs by one per month since Dec16
2016	4.90	4.90	4.90
2017	5.43 (+0.53)	5.49 (+0.59)	5.36 (+0.46)
2018			

Source: Natixis

Note: Shale basins used in the calculation were Bakken, EagleFord, Permian, Niobrara, Utica, Marcellus, Haynesville

NATIXIS BEYOND BANKING

2 Company Guidance

- **0.56mn b/d set to be added to total US production from the companies within our sample, which captures 4.37mn b/d of US production for 2017.**
- **Extrapolating a ratio of our sample's actual 2016 production to total 2016 US production onto 2017 guidance gives us a total growth of 1.07mn barrels YoY in 2017**

Production Change vs Previous Year

	Guidance		Actual		Guidance	
Company Type	2016 Average Change	2016 b/d	2016 Average Change	2016 b/d	2017 Average Change	2017 b/d
Overall	-5.7%	-224,542	-3.2%	-124,889	14.7%	560,783
Investment Grade	-2.6%	-44,462	5.3%	89,102	10.0%	178,343
Sub-Investment Grade	-8.0%	-180,080	-9.5%	-213,991	18.8%	382,441
> 40,000 b/d production	-5.7%	-194,439	-2.2%	-75,430	14.6%	488,330
< 40,000 b/d production	-4.4%	-22,462	-9.6%	-49,459	15.6%	72,454

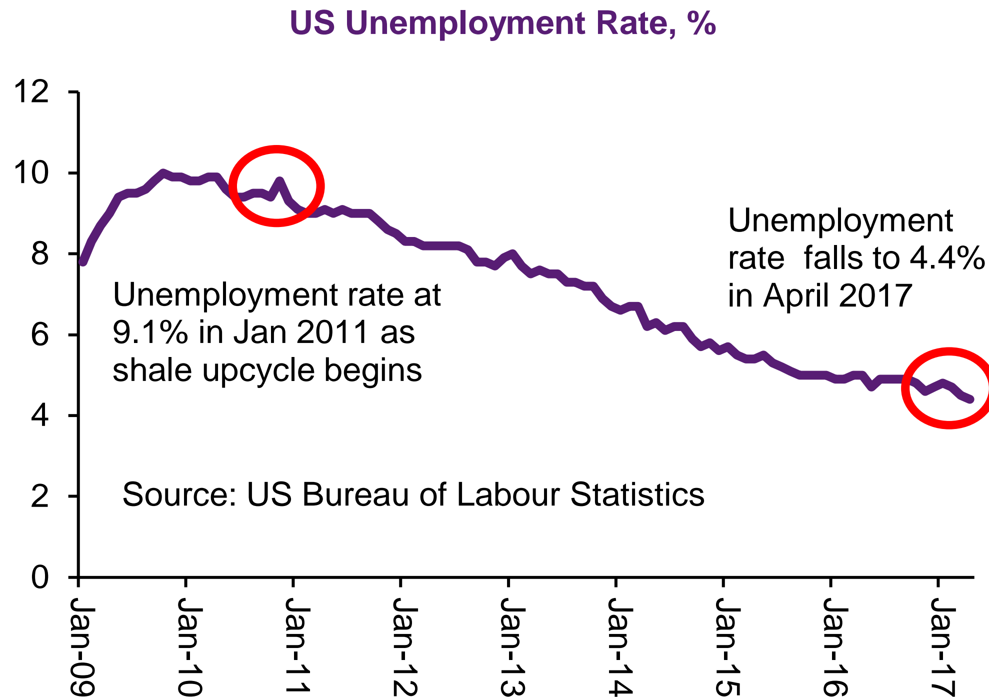
Where guidance refers to prospective company guidance published in Q1 of that year and actual refers to actual values published retrospectively in 10k SEC filings.
Source: Company filings, Natixis

2 We forecast growth of 0.9mn b/d in 2017, between company guidance and our productivity model

Supply Growth, mn bbl (16-17)	
Natixis	0.90
EIA (Jun-17)	0.79
IEA (Jun-17)	0.62
OPEC (Jun-17)	0.79

NATIXIS BEYOND BANKING

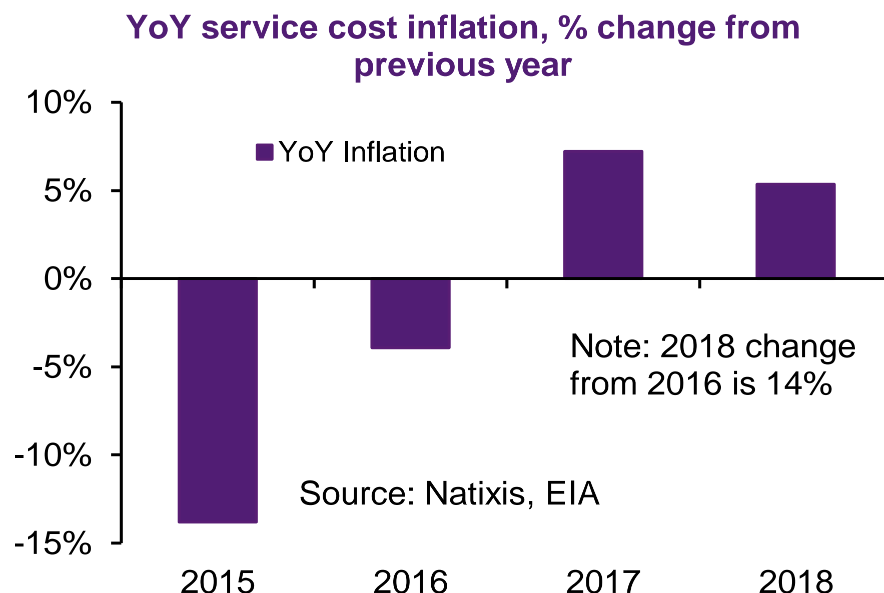
2 We believe the high level of activity in the L48 could be constrained however due to service companies being unable to absorb the uptick in demand, as well as service cost inflation…



NATIXIS BEYOND BANKING

2 Service Cost Inflation

- **Taking a basket of the 5 main cost drivers of an unconventional oil well (casing and cement, proppant, completion fluids, pressure pumping and rig costs) and modelling potential cost inflation based on the demand side (potential volume of wells being drilled and the changing nature of these wells) and the supply side (availability of equipment and workers), we have identified potential cost inflation of 7% YoY for well service costs between 2016 and 2017, with a further 5% in 2017-2018.**
- **We do not expect service costs to reach 2014 levels, however, even by 2018.**



NATIXIS BEYOND BANKING

- **Near-term – US upstream sector will continue to be dominated by the trends of well optimisation and the increased volume of wells**
- **Rig counts will continue to rise and the high volume of DUCs across the L48, but especially the Permian, present significant untapped volume potential**

- **Mid-term - Cost inflation and the slowdown in technological advancement in the L48 should eventually slow down shale oil production growth in the US (by the end of 2018 if not earlier).**

- **Despite the less positive outlook going forward, the near-term trends could still result in a record amount of US crude reaching the global market**

NATIXIS BEYOND BANKING

US COMPANIES

NATIXIS BEYOND BANKING

3 Company Guidance Review

- **Of the 68 companies included in our analysis, eight are investment grade with the rest sub-investment grade. We have further broken down our sample by daily production volume, with 27 companies (the entire investment grade group is included in this category) with production greater than 40,000 b/d and 41 companies with production less than 40,000 b/d.**

- **In order to analyse the full diversity of the US upstream sector, our sample ranges in size from small independents with production as low as 1000 b/d, to integrated majors with production over 500,000 b/d, although only production from US operations has been taken for the purpose of this report.**

Sample breakdown

Daily Production	Investment Grade	Sub-investment Grade	Total
> 40,000 b/d production	8	19	**27**
< 40,000 b/d production	0	41	**41**
Total	8	60	**68**

NATIXIS BEYOND BANKING

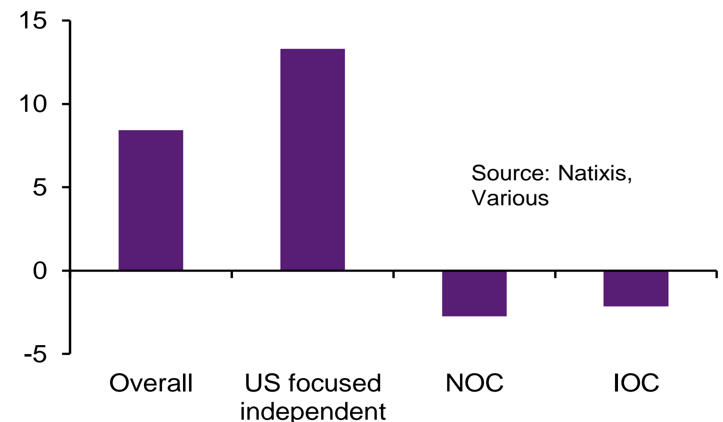
3 Capex is set to increase by $13.3bn, or 19.9% year-on-year for the 68 companies in our sample

- The quick response to rising prices by US-focused E&P companies is at odds with the rest of the industry; in a separate survey of 121 E&P companies globally, we found an essentially flat growth of just 5% with US-focused companies included.
- This disparity is due in part to the short development cycles of tight oil and shale oil basins which allow a greater degree of reactivity to oil price movements, and also to the high degree of hedging by US oil companies improving cash flow in the very near-term.
- With reduced operating costs and break evens, the companies in US are more nimble today than two years ago.

Capex change versus previous year

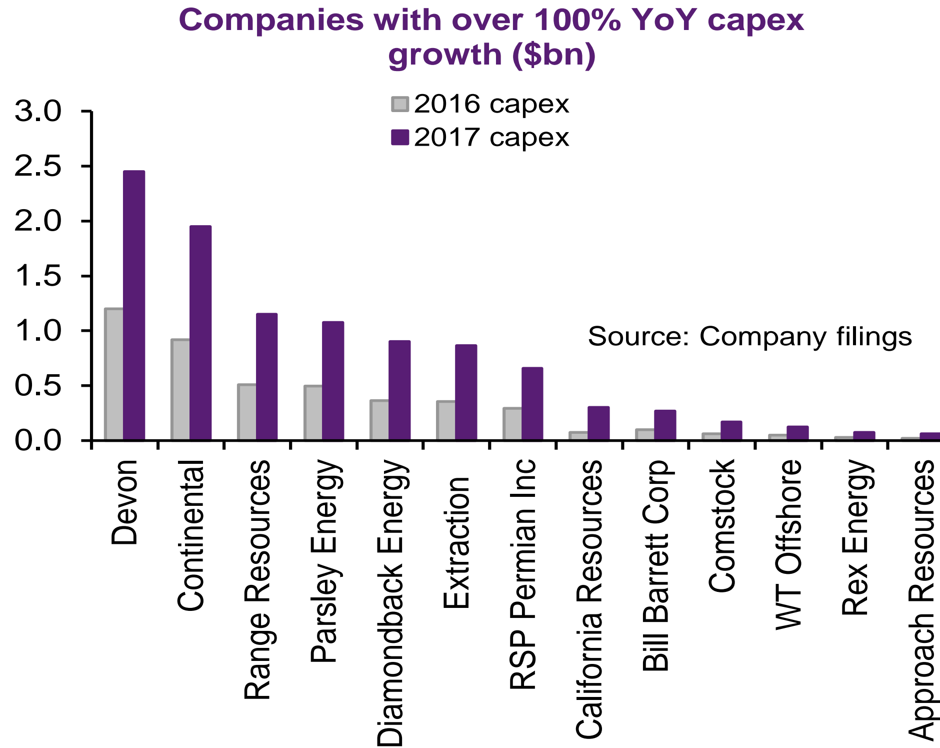
	Guidance	Actual	Guidance
Company Type	2016 Average Change	2016 Average Change	2017 Average Change
Overall	-45%	-43%	62%
Investment Grade	-36%	-37%	34%
Sub-investment Grade	-47%	-43%	65%
> 40,000 b/d production	-47%	-47%	65%
< 40,000 b/d production	-44%	-40%	59%

Where guidance refers to prospective company guidance published in Q1 of that year and actual refers to actual values published retrospectively in 10k SEC filings. Source: Company filings, Natixis



NATIXIS BEYOND BANKING

3 Some companies set to record YoY capex growth of over 100%



NATIXIS BEYOND BANKING

3 Hedging & Risk Management

- For our sample, the total number of barrels hedged for 2017 is 1.29mn b/d, which is ~30% of total production. This is higher than the 982,000 b/d hedged last year, or 25% of total 2016 production. The unweighted average hedge is 43.4%, skewed by the higher proportions in smaller oil companies

Average production hedged, 2016 and 2017

Company Type	Weighted Average Hedge	2016 Average Hedge	Weighted Average Hedge	2017 Average Hedge
Overall	25.0%	39.2%	29.7%	43.4%
Investment Grade	8.9%	15.8%	14.3%	23.1%
Sub-Investment Grade	39.0%	42.4%	42.9%	46.1%
> 40,000 b/d production	21.9%	35.9%	27.6%	41.4%
< 40,000 b/d production	46.7%	41.5%	47.4%	44.7%

Source: Company filings, Natixis

3 Hedging Profile

- One of the more striking trends revealed in our analysis of the hedging activity of US companies is surge in popularity of options, with swaps in general declining slightly. Overall, the YoY weighted average change in swaps 2016-17 is -0.8%, with options increasing by 7.2%.

Change in % oil production hedged, 2016 and 2017

2017 Percentage Oil Production Hedged	Weighted average swaps	Average swaps	Weighted average options	Average options
Overall	13.3%	21.3%	17.6%	22.0%
Investment Grade	3.0%	3.1%	12.3%	20.8%
Sub-Investment Grade	21.7%	23.7%	22.0%	22.2%
> 40,000 b/d production	12.2%	20.1%	16.4%	22.2%
< 40,000 b/d production	20.9%	22.1%	26.4%	21.9%

2016 Percentage Oil Production Hedged	Weighted average swaps	Average swaps	Weighted average options	Average options
Overall	14.1%	24.3%	10.5%	14.4%
Investment Grade	3.5%	6.2%	5.4%	9.6%
Sub-Investment Grade	23.4%	26.8%	14.9%	15.0%
> 40,000 b/d production	11.9%	22.0%	9.8%	13.3%
< 40,000 b/d production	30.2%	25.9%	15.6%	15.1%

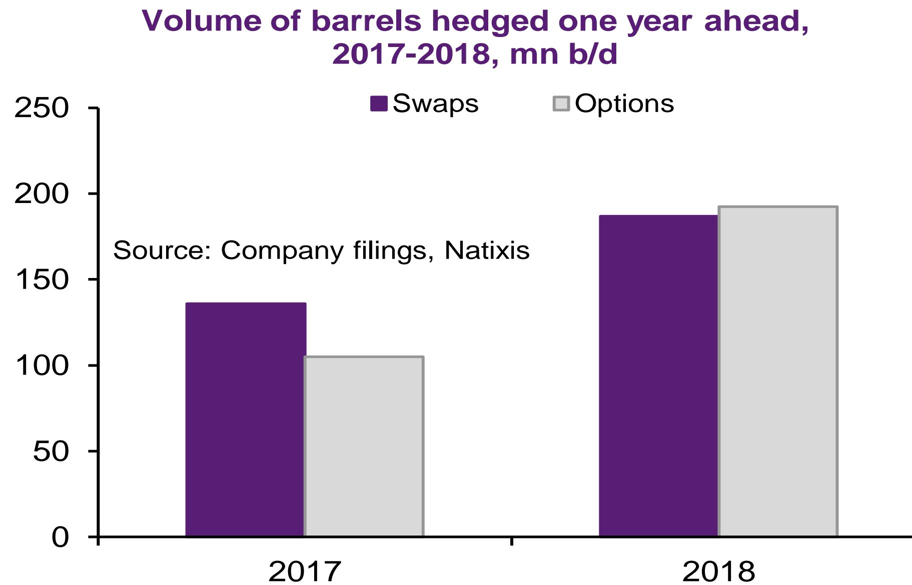
Difference Percentage Oil Production Hedged	Weighted average swaps	Average swaps	Weighted average options	Average options
Overall	-0.8%	-3.0%	7.2%	7.6%
Investment Grade	-0.5%	-3.2%	6.8%	11.2%
Sub-Investment Grade	-1.8%	-3.0%	7.1%	7.1%
> 40,000 b/d production	0.3%	-1.9%	6.6%	8.9%
< 40,000 b/d production	-9.3%	-3.8%	10.8%	6.8%

Source: Company filings, Natixis

NATIXIS BEYOND BANKING

3 Hedging in 2018

- **35 companies have production hedged in 2018, as opposed to 20 in 2016 for 2017, with absolute volumes hedged one year forward up by 138,454 b/d.**



Total volume of barrels hedged one year ahead (b/d)

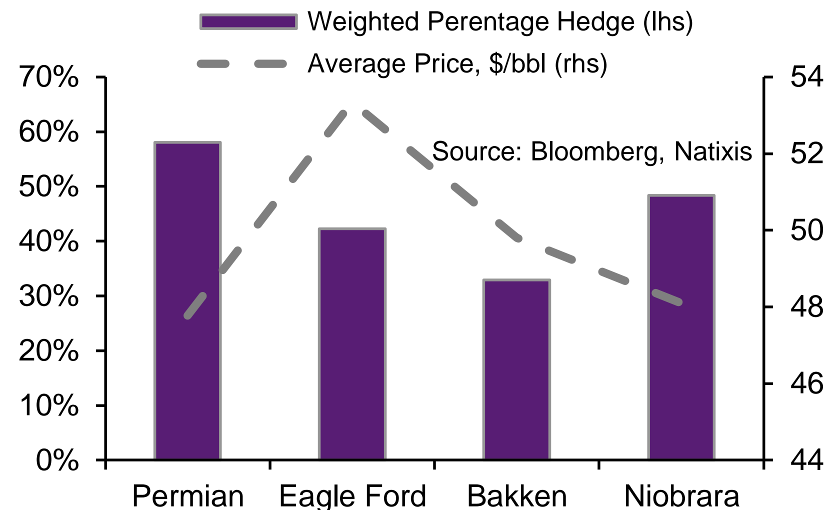
Hedge Type	2017 Hedges in H1 2016	2018 Hedges in H1 2017
Overall	240,814	379,269
Swaps	135,895	186,934
Options	104,919	192,335

Source: Company filings, Natixis

NATIXIS BEYOND BANKING

3 Hedging by Region

- When compared to the other oil-focused basins, operators in the Permian are in general hedged to a higher degree, at lower prices.
- Lower priced hedges can still be profitable in the Permian due to the lower break-evens resulting in favourable well economics. As capital becomes focused in the Permian and operations ramp up, producers need to maintain cash flow, which could explain the higher volumes hedged than the other oil dominated plays.



NATIXIS BEYOND BANKING

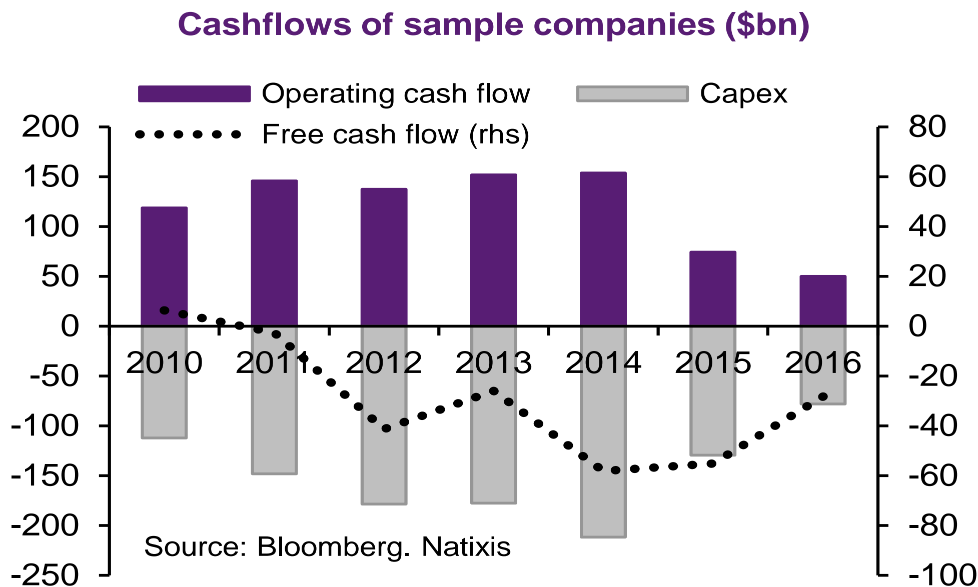
FINANCIALS

NATIXIS BEYOND BANKING

4 Cash Flow

- For free cash flows (FCF), which is the operating cash flow subtracted by capex, this has consistently remained in negative territory since 2011. This provides an indication of a company's ability to service its debt.
- Looking ahead, operating cash flow should recover in line with oil prices as, thanks to efficiency gains and cost cuts, the US companies have become more nimble. This could bring FCF into positive territory.

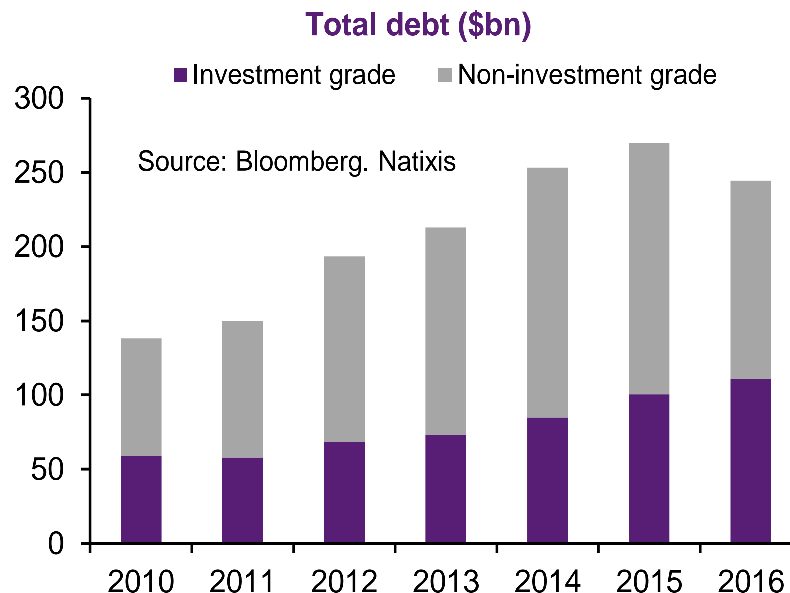
Cashflows of sample companies ($bn)



NATIXIS BEYOND BANKING

4 Total Debt

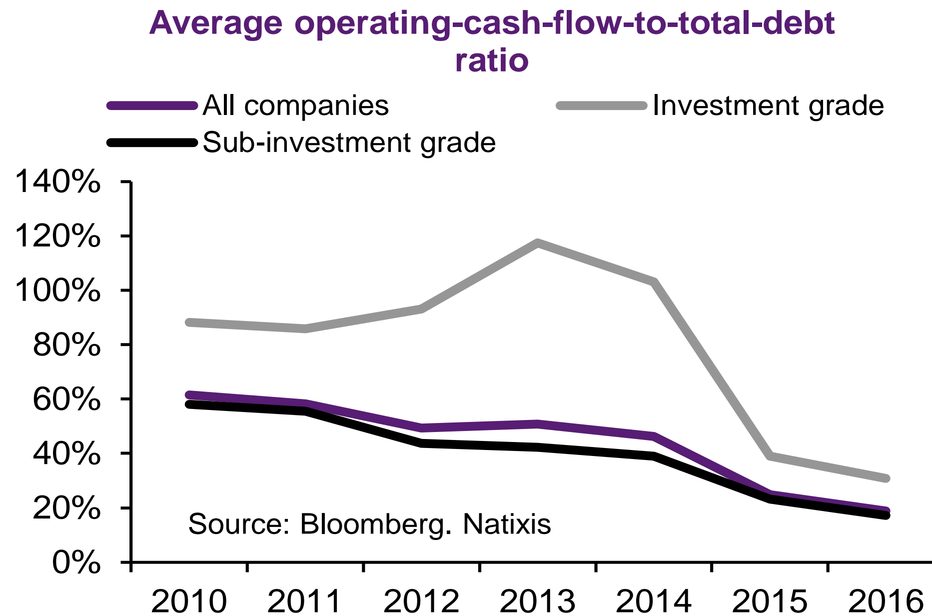
- **Total debt had risen year-on-year until 2016, driven by sub-investment grade companies. Since then, the same group have led to a decline in total debt levels**
- **This is likely to have been driven by restructuring, such as through asset sales and convertible notes, by both bankrupt companies and operating companies. For investment grade companies however, by their very nature, they have the ability to access the capital markets at lower costs and are therefore inclined to continue utilising debt to grow their business.**



NATIXIS BEYOND BANKING

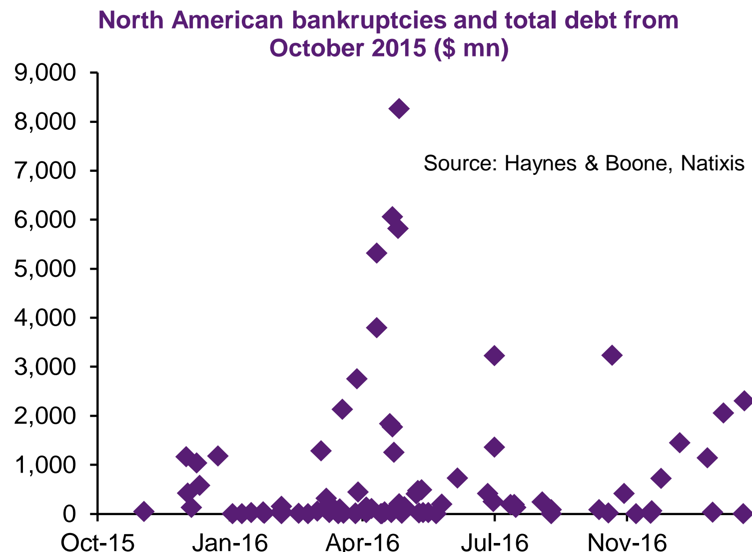
4 Average operating cash flow to total debt ratio

- **The average for the all companies in the sample and the subgroups show a decline in 2015. This highlights the ability of a company to cover its debt with yearly cash flows and therefore its financial health.**
- **Sub-investment grade companies resisted a sharp decline in the ratio in 2015 with their hedges a probable contributor to cash flows. Investment grade companies on the other hand have increased their indebtedness in the last few years to finance new investments and dividends, explaining the sharp fall in their ratio. While we expect operating cash flows to recover in line with oil prices, the high debt levels are likely to keep this ratio depressed for the sector.**



4 Bankruptcies

- Total bankruptcies since the beginning of 2015 have risen to 119 as of February 2017. Out of that number, 70 companies have filed for bankruptcy in 2016 with secured debt at $20.3bn and unsecured debt at $36.5bn.
- Large bankruptcies have continued into early 2017 as indicated by the size of debt, $2bn secured and $3.5bn unsecured respectively. The likes of Vanguard Natural Resources and Memorial Production Partners in the first two months of this year show that, despite the rally in December 2016, prices remain challenging.
- However, the unprecedented frequency of bankruptcies and size of certain companies entering bankruptcy in 2016H1 is unlikely to be repeated again any time soon unless there is an unprecedented collapse in oil prices.



CONCLUSION

NATIXIS BEYOND BANKING

5 Conclusion

- **It is evident that, based on our models and current data available for US shale resources, that US production will increase in 2017. We have taken a value for YoY production growth of 900,000 b/d, which lies between US company guidance based on a portfolio of 68 companies which suggests aggressive growth of over 1.1mn b/d on average and our productivity model which suggests 590,000 b/d.**
- **We believe the potential cost inflation and efficiency gains reaching the top of “S” curve could put brakes on the aggressive rise in US oil output. In terms of timing, this is likely to be later in 2018; the near term will continue to be dominated by the prevailing trends of optimisation and increased volume of drilling, in our view.**
- **The hedges of the US producers clearly support increasing production this year but the end of next year remains a big question mark. Whilst year-ahead hedging has been strong relative to what was observed last year, providing a buffer for production if prices remain low, it is still prudent for producers to guarantee more certainty from their cash flows. Particularly if increased production activity pushes up costs and the uncertainties with regards to prices, 2018 hedges could provide support in light of the financial conditions of many of these companies.**

5 Our Research Products

US NATURAL GAS REVIEW
2017-18

NATIXIS

CORPORATE & INVESTMENT BANKING / INVESTMENT SOLUTIONS & INSURANCE / SPECIALISED FINANCIAL SERVICES

US UPSTREAM REVIEW
2017

5 Author Biography

Dr Abhishek Deshpande heads the energy research in the commodities research team at Natixis, providing price forecasts and strategies based on fundamental research and analysis of global energy markets. Abhishek has a doctorate in Chemical Engineering from Cambridge University and holds Chartered status with the Institute of Engineers and Energy Institute, UK. While pursuing his degree, he spent time working for Indian Oil Corporation Limited.

Abhishek has an extensive media coverage and has appeared on BBC, CNN, SKY News, CNBC, and Bloomberg. He has presented his work at leading Oil and Gas conferences. He has also published articles in energy journals such as Petroleum Economics. Recently he was awarded the “2016 Energy Executive of the Year” Award by Petroleum Economist.

Joel Hancock joined Natixis as an energy analyst within the Commodities Research team in 2017. He provides support for the team’s publications through in-depth research and analysis of the global oil industry. He is also responsible for authoring the team’s weekly oil reports.

Joel graduated in 2016 with an MSci in Geology from Imperial College London. Joel previously worked at upstream consultancy Douglas-Westwood and as an intern at Wood Mackenzie.

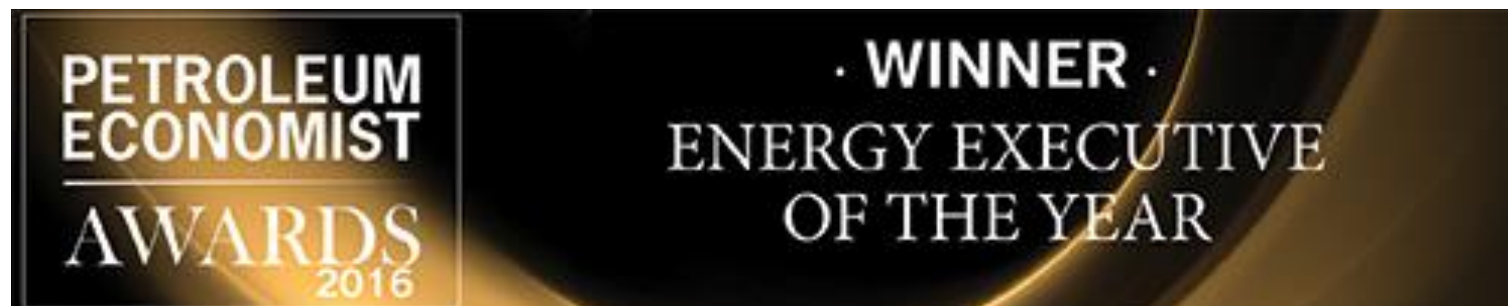
Michael Liu works as an energy analyst within the Commodities Research team. He supports the team in carrying out in-depth oil & oil products fundamental research and analysis. He is responsible for contributing towards client presentations and commodities reports.

Michael graduated in 2015 with a BA in Mathematics from St. Catherine’s College, Oxford University. Michael previously worked in equities research at Edison Investment Research and before that an intern at Towers Watson in consulting.

5 Energy Research Awards

EnergyRisk
Awards
2017
Winner

Natixis
Commodity or
energy research
house of the year



5 Disclaimer

The information contained in this publication and any attachment thereto is exclusively intended for a client base consisting of professionals and qualified investors. This document and any attachment thereto are strictly confidential and cannot be divulgated to a third party without the prior written consent of Natixis. If you are not the intended recipient of this document and/or the attachments, please delete them and immediately notify the sender. Distribution, possession or delivery of this document in, to or from certain jurisdictions may be restricted or prohibited by law. Recipients of this document are required to inform themselves of and comply with all such restrictions or prohibitions. Neither Natixis, nor any of its affiliates, directors, employees, agents or advisers or any other person accepts any liability to any person in relation to the distribution, possession or delivery of this document in, to or from any jurisdiction.

This document has been developed by our economists. It does not constitute a financial analysis and has not been developed in accordance with legal requirements designed to promote the independence of investment research. Accordingly, there are no prohibitions on dealing ahead of its dissemination.

This document and all attachments are communicated to each recipient for information purposes only and do not constitute a personalized investment recommendation. They are intended for general distribution and the products or services described herein do not take into account any specific investment objective, financial situation or particular need of any recipient. This document and any attachment thereto shall not be construed as an offer nor a solicitation for any purchase, sale or subscription. Under no circumstances should this document be considered as an official confirmation of a transaction to any person or entity and no undertaking is given that the transaction will be entered into under the terms and conditions set out herein or under any other terms and conditions. This document and any attachment thereto are based on public information and shall not be used nor considered as an undertaking from Natixis. All undertakings require the formal approval of Natixis according to its prevailing internal procedures.

Natixis has neither verified nor carried out independent analysis of the information contained in this document. Accordingly, no representation, warranty or undertaking, either express or implied, is made to the recipients of this document as to or in relation to the relevance, accuracy or completeness of this document or as to the reasonableness of any assumption contained in this document. Information does not take into account specific tax rules or accounting methods applicable to counterparties, clients or potential clients of Natixis. Therefore, Natixis shall not be liable for differences, if any, between its own valuations and those valuations provided by third parties; as such differences may arise as a result of the application and implementation of alternative accounting methods, tax rules or valuation models. The statements, assumptions and opinions contained in this document may be changed or may be withdrawn by Natixis at any time without notice.

Prices and margins are indicative only and are subject to change at any time without notice depending on, *inter alia*, market conditions. Past performances and simulations of past performances are not a reliable indicator and therefore do not anticipate any future results. The information contained in this document may include results of analyses from a quantitative model, which represent potential future events that may or may not be realised, and is not a complete analysis of every material fact representing any product. Information may be changed or may be withdrawn by Natixis at any time without notice. More generally, no responsibility is accepted by Natixis, nor any of its holding companies, subsidiaries, associated undertakings or controlling persons, nor any of their respective directors, officers, partners, employees, agents, representatives or advisers as to or in relation to the characteristics of this information. The statements, assumptions and forecasts contained in this document reflect the judgment of its author(s), unless otherwise specified, and do not reflect the judgment of any other person or of Natixis.

The information contained in this document should not be assumed to have been updated at any time subsequent to the date shown on the first page of this document and the delivery of this document does not constitute a representation by any person that such information will be updated at any time after the date of this document.

Natixis shall not be liable for any financial loss or any decision taken on the basis of the information disclosed in this presentation and Natixis does not provide any advice, including in case of investment services. In any event, you should request for any internal and/or external advice that you consider necessary or desirable to obtain, including from any financial, legal, tax or accounting adviser, or any other specialist, in order to verify in particular that the transaction described in this document complies with your objectives and constraints and to obtain an independent valuation of the transaction, its risk factors and rewards.

Natixis is authorized in France by the *Autorité de Contrôle Prudentiel et de Régulation* (ACPR) as a Bank -Investment Services Provider and subject to its supervision.

Natixis is regulated by the *Autorité des Marchés Financiers* in respect of its investment services activities.

Natixis is authorized by the ACPR in France and regulated by the Financial Conduct Authority (FCA) and the Prudential Regulation Authority in the United Kingdom. Details on the extent of regulation by the FCA and the Prudential Regulation Authority are available from Natixis' branch in London upon request.

Natixis is authorized by the ACPR and regulated by the BaFin (*Bundesanstalt für Finanzdienstleistungsaufsicht*) for the conduct of its business under the right of establishment in Germany.

Natixis is authorized by the ACPR and regulated by Bank of Spain and the CNMV (*Comisión Nacional de Mercado de Valores*) for the conduct of its business under the right of establishment in Spain.

Natixis is authorized by the ACPR and regulated by Bank of Italy and the CONSOB (*Commissione Nazionale per le Società e la Borsa*) for the conduct of its business under the right of establishment in Italy.

Natixis is authorised by the ACPR and regulated by the Dubai Financial Services Authority (DFSA) for the conduct of its business in and from the Dubai International Financial Centre (DIFC). The document is being made available to the recipient with the understanding that it meets the DFSA definition of a Professional Client; the recipient is otherwise required to inform Natixis if this is not the case and return the document. The recipient also acknowledges and understands that neither the document nor its contents have been approved, licensed by or registered with any regulatory body or governmental agency in the GCC or Lebanon.

All of the views expressed in this research report accurately reflect the research analyst's personal views regarding any and all of the subject securities or issuers. No part of analyst compensation was, is or will be, directly or indirectly related to the specific recommendations or views expressed in this research report.

I(WE), ANALYST(S), WHO WROTE THIS REPORT HEREBY CERTIFY THAT THE VIEWS EXPRESSED IN THIS REPORT ACCURATELY REFLECT OUR(MY) PERSONAL VIEWS ABOUT THE SUBJECT COMPANY OR COMPANIES AND ITS OR THEIR SECURITIES, AND THAT NO PART OF OUR COMPENSATION WAS, IS OR WILL BE, DIRECTLY OR INDIRECTLY, RELATED TO THE SPECIFIC RECOMMENDATIONS OR VIEWS EXPRESSED IN THIS REPORT.

The personal views of analysts may differ from one another. Natixis, its subsidiaries and affiliates may have issued or may issue reports that are inconsistent with, and/or reach different conclusions from, the information presented herein.

Natixis, a foreign bank and broker-dealer, makes this research report available solely for distribution in the United States to major U.S. institutional investors as defined in Rule 15a-6 under the U.S. securities Exchange Act of 1934. This document shall not be distributed to any other persons in the United States. All major U.S. institutional investors receiving this document shall not distribute the original nor a copy thereof to any other person in the United States. Natixis Securities Americas LLC, a U.S. registered broker-dealer and member of FINRA, is a subsidiary of Natixis. Natixis Securities Americas LLC did not participate in the preparation of this research report and as such assumes no responsibility for its content. This research report has been prepared and reviewed by research analysts employed by Natixis, who are not associated persons of Natixis Securities Americas LLC and are not registered or qualified as research analysts with FINRA, and are not subject to the rules of the FINRA. In order to receive any additional information about or to effect a transaction in any security or financial instrument mentioned herein, please contact your usual registered representative at Natixis Securities Americas LLC, by email or by mail at 1251 Avenue of the Americas, New York, NY 10020.