2014 Oil Market Outlook

– Lower average price in 2014

- Brent forecast maintained at 102 $/b for 2014
- Global oil fundamentals looking weak (decreasing call on OPEC)
- But shut out barrels from key producers will keep prices just above 100 $/b

December 10 - 2013 - Torbjørn Kjus

Content

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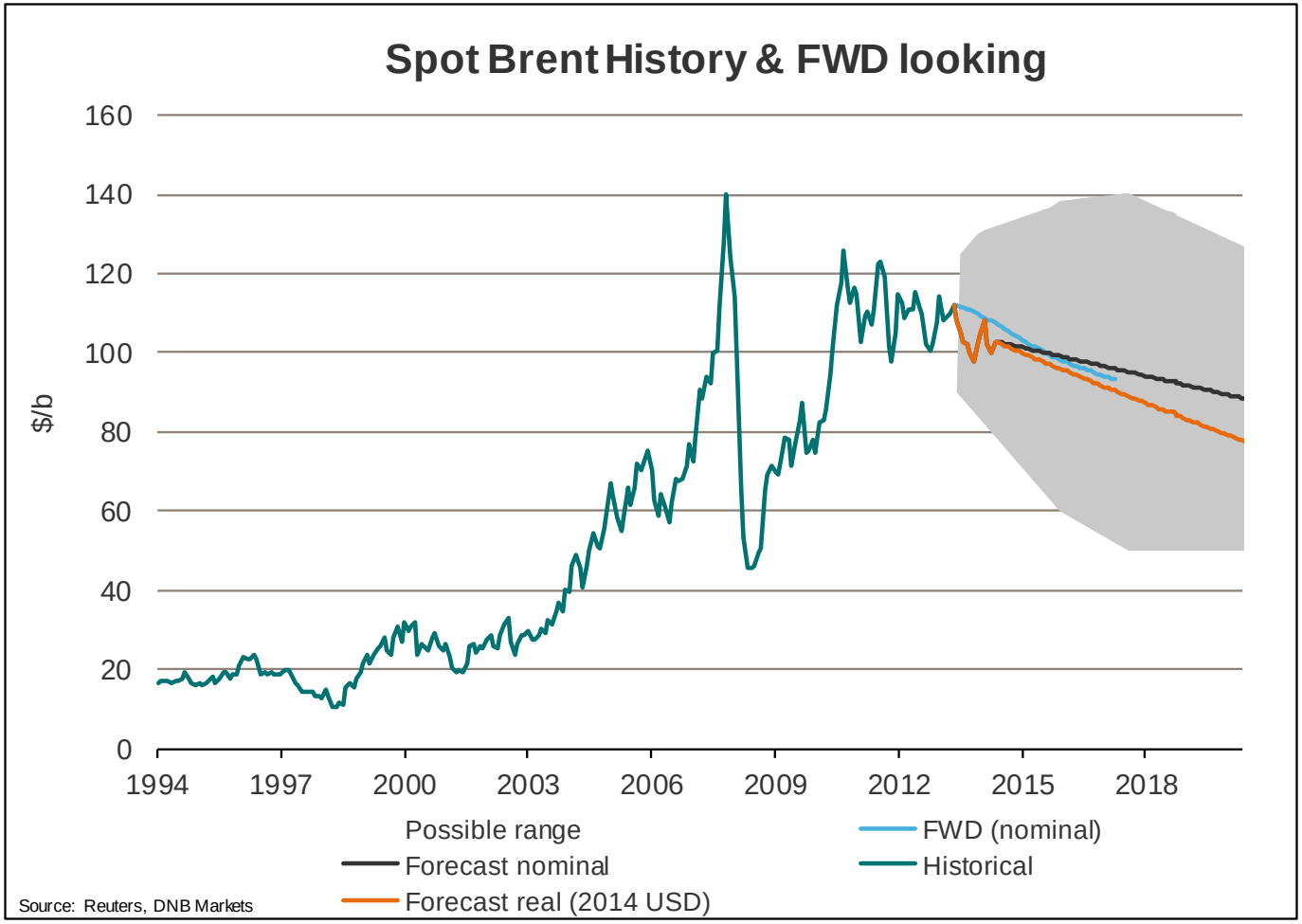
Long Term Oil Price Forecast

(The forecast is for the average of the rolling 1st month ICE Brent future contract)

	Historical Nominal $/b	Historical Real (2012) $/b
2001	24.9	31.7
2002	25.1	31.9
2003	28.5	36.0
2004	38.1	46.5
2005	55.0	64.1
2006	66.2	74.2
2007	72.7	80.2
2008	98.7	103.7
2009	62.6	66.0
2010	80.4	83.7
2011	110.8	113.6
2012	111.7	111.7
2013	108.7	108.7
	Forecast Nominal $/b	**Forecast Real (2014) $/b**
Q1-14	105.0	105.0
Q2-14	100.0	100.0
Q3-14	104.0	104.0
Q4-14	102.0	102.0
2014	102	102
2015	100	100
2016	98	97
2017	96	93
2018	94	89
2019	92	85
2020	90	82



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2014 Oil Price Scorecard – Brent Forecast Maintained @ 102 $/b

2014 Oil Price Scorecard	Comments	Oil Price	Weight
Overall Outlook	We forecast that oil prices will continue to slide lower on average in 2014, just like they have done so far in 2013. Non-OPEC supply growth is forecasted to outpace global oil demand growth, creating a need for less oil from OPEC. Geopolitical risk will however likely continue to be supportive for oil prices also in 2014.	**Average price 102 $/b**	
Fundamentals			
Global Fundamental Balance	We believe the "Call on OPEC" will decrease significantly in 2014, unless unplanned disruptions in oil production continue to increase.	**BEARISH**	**HIGH**
Crude vs Product Balance (Margins)	Expansions of global refinery capacity is set to outpace the growth in demand for refined products and this is not good for margins.	BEARISH	MEDIUM
OECD Stock levels	Total OECD oil stocks are at the top of the 5-year range and will continue to be high during 2014.	BEARISH	LOW
OPEC Spare Capacity	OPEC spare capacity will increase as Saudi Arabia will trottle back some output, but unplanned outages create a wild card.	BEARISH	MEDIUM
US Oil Statistics - Fundamentals	In the US, oil demand will be slightly up next year and oil productioin will continue to grow, creating still lower need for imports.	BEARISH	MEDIUM
Global Demand Growth	Global oil demand will grow 1.1 million b/d in 2014, just like in 2013, but the content of the growth shifts a little bit as OECD will show some small growth but non-OECD growth will be slightly weaker than in 2013.	NEUTRAL	MEDIUM
OPEC Supply	Total OPEC supply is dependant on unplanned disruptions. If disruptions does not increase, core-OPEC will have to cut output. If so happens spare capacity will rise for every barrel Saudi/Emirates/Kuwait cuts output.	NEUTRAL	MEDIUM
Non-OPEC Supply	Non-OPEC supply continue to grow more than demand in 2014, mainly du to the shale revolution in the US, but we now see supply growth also in many other non-OPEC countries.	BEARISH	MEDIUM
Political Risk			
Iraq, Iran, Nigeria, Venezuela, US, Russia, Israel, MENA, etc	Political risk will continue to be elevated in 2014, but the Iranian intermediate nuclear deal poses potential for lower risk ahead.	BULLISH	MEDIUM
Other Factors			
Financial Money Flow	Investors are starting to doubt the need to own commodities as part of their portfolio. Gradually more investors seem to start believeing that the commodity super-cycle is over. And what happens to investor flows as FED-tapering begins next year…	BEARISH	MEDIUM

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2014 Oil Market Outlook

- Weaker global supply-demand fundamentals suggest oil prices should continue to trend lower in 2014
- Still support from political risk but potential for many shut out barrels to re-enter the market

Overall outlook:

We forecast that oil prices will continue to slide lower on average in 2014, just like they have done in 2013. We are quite happy with our reading of the 2013-market as in retrospect it seems we timed our turning point from bullish to bearish quite well in the summer of 2012. Our regular readers will know that we had been bullish to the oil market for more than 4 years when we made that U-turn. On 22 August 2012 the Brent price was 116 $/b and we forecasted 107 $/b for 2013, a forecast we maintained in our 2013 oil market outlook, published 29 November 2012. We are now on track to see an average oil price in 2013 at 108.7 $/b, which implies a reduced oil price of about 3 $/b (2.7% down) for 2013. An oil price drop of 3 $/b does not seem much but becomes more significant when noting that during the last 15 years this will only be the third time we have seen an oil price decrease. For 2014 we believe the price decrease will be about twice as large as for 2013 and we maintain our forecast of 102 $/b, which would imply a 6-7 $/b (6%) lower oil price than in 2013.

We were correct for the direction of the market in 2013 and we have a fairly high conviction that we will be correct in our assessment of the 2014 market as well. If anything we think there is more downside risk than upside risk to our 102 $/b forecast. The key downside risk is connected to a quicker return of Libya/Iran to the market than we currently expect, the risk of what can happen to the markets (particularly the emerging markets) when the FED QE-tapering starts and the risk of much weaker economic growth in China than what we currently expect. Upside risk is mainly related to further geopolitical risks, particularly Iraq which has seen growing violence since the summer, and the possibility that OECD oil demand could surprise to the upside. If OECD demand grows quicker than we assume we believe that will be connected to upside surprises in the US, rather than in Europe and Japan. We believe several OECD countries will perform better in 2014 than 2013 with respect to oil demand changes, but for many of them this has to do with growth rates becoming less negative rather than turning positive.

Our key argument to expect further weakness in oil prices for 2014 is that we expect Non-OPEC supply growth to materially outpace global oil demand growth, creating a need for significantly less oil from OPEC. IEA in fact expect record high non-OPEC growth in 2014 of 1.8 million b/d and note that IEA was too pessimistic for non-OPEC growth in 2013 when they expected 1.0 million b/d of growth. It is worth emphasising that the last 5-6 months we have started to see meaningful production growth in other non-OPEC countries than just USA/Canada as well. To put it in oil terminology; the “Call on OPEC” will drop meaningfully next year and when that happens the average oil price tends to drop as well. Geopolitical risk will however likely continue to be supportive for oil prices also in 2014, but there are large wild-cards relating to the Iranian nuclear deal that was reached in November. If a broad based deal with Iran can be reached during the next six months of negotiations, the price picture could turn out much more bearish than our forecast of 102 $/b for 2014.

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Long Held Relationships Breaking Apart

- LNG Heavy Duty Trucking in China, OECD economic growth vs oil demand, US VMT vs population growth, New US efficiency standards, US GOM crude prices vs International prices, USD strength/weakness vs oil prices, Equity markets vs oil prices, etc

We are now in a period where it has become more difficult than ever before to predict future oil prices. The reason is that we have seen destructions of old data relationships that have been with us for decades and we also see exponential developments in important parts of the energy markets. It is always hard to predict exponential developments. Let us start by mentioning an example of what is going on with respect to the Chinese effort to move Heavy Duty trucking over from diesel to natural gas (LNG). In its recently released World Energy Outlook the IEA writes that in 2012 there were 800 LNG filling stations in China and that the sales of LNG Heavy Duty Trucks increased by 60% in 2012. The interesting issue is that there are no longer 800 LNG filling stations in China. According to ChinaOil, the number of LNG filling station increased by almost 30% (from 1325-1700) just during the third quarter of 2013… One of the key reasons for why this exponential growth in LNG for trucking is happening is related to local pollution in the cities (particles emissions more than CO2). This movement over towards LNG for Heavy Duty Trucking is probably one of the reasons why diesel demand has not performed in China the last two years. We also see the start of possible meaningful momentum in US Heavy Duty trucks moving over to natural gas, but this is related to the blow out in the price spread between natural gas and oil in the US. US sales of natural gas fired trucks in the HDV-segment is set to increase from 1% in 2013 to 5% in 2014 and the inflection point looks to be the new LNG-engine from Westport-Cummins. We could in other words be in for an exponential development in both China and the US with respect to natural gas usage in Heavy Duty trucking.

We have seen several other developments the last years and also just the last 3-4 months that makes it hard to predict the future. The old relationship between economic growth and oil demand growth in the OECD that for decades suggested that if GDP in the OECD grows 1% then oil demand should grow 0.5% has broken apart and since 2005 there has been very little “bang for the buck” with respect to oil demand growth in the OECD on the back of economic growth. The relationship has in fact turned negative, and unfortunately for those that need oil demand growth we believe some of these changes are structural and not only cyclical. It has mainly to do with efficiency improvements but substitution also plays its meaningful part, particularly for oil used in stationary purposes. We do however believe that substitution related to the US Heavy Duty Trucking is just around the corner.

Total US Vehicle Miles Travelled (VMT) has disconnected from both population growth and disposable income per capita since 2005. Why is this happening? How much is caused by structural factors like demographic changes (baby-boomers becoming pensioners), technology break throughs (different use of the internet by young people after the smart phones entered the world), etc, etc? We think some of the changes are structural and not all cyclical, otherwise we would have expected the development in disposable income per capita to still correlate with the total VMT. Important is also the huge shift in driving standards in the USA which has just started to be hiked after decades of standstill. The Corporate Average Fuel Efficiency (CAFÉ) standard will be hiked from 30 Miles Per Gallon (MPG) in 2013 to about 50 MPG by 2025 (about a 67% improvement in efficiency). According to the University of Michigan - Transport Research Institute the improvements in efficiency are already very visible. The window-sticker MPG for new light-duty-vehicles sold in the US has improved from about 20 MPG in 2008 to almost 25 MPG in 2013 (the window sticker MPG this is not the same as the CAFÉ-standard).

We also see other relationships breaking apart during 2013, like USD vs oil prices, the Equity market vs oil prices and the price spreads between international oil prices and waterborne crude oil in the US GOM has recently blown out of all historical proportions. What kind of consequences will all this have? Well one consequence is that European refiners are being slowly “strangled” by US GOM refiners which now have immensely cheaper feedstock than its European peers due to the law that forbids US exports of crude. Instead they now refine their cheap crude and send the products to Europe…

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Continued Increase In Outages Necessary For Higher Oil Prices

- In our opinion you have to believe in continued growth in unplanned outages to be bullish to oil prices in 2014

The last one and a half year the Brent price has been undershooting, overshooting, undershooting, overshooting compared with our average price forecast. This is also how it is going to continue. Our forecast is a forecast of the average price and not a price target, like for example equity analysts will operate with for the share price in a company they cover. Oil producers generally receive an average price for their production and consumers pay an average price for their consumption and hence it makes more sense to us to forecast average prices than price targets for oil. Only 3 weeks is left of 2013 and we can hence with a 99.9% certainty state that the average oil price this year will be down. The Brent price will have to average above 160 $/b the last three weeks of the year in order to avoid a drop in the average price. If we drag 112 $/b forward the Brent price will average 108.7 $/b for 2013 which is about 3 $/b down on 2012.

As already stated we are maintaining the average price forecast for 2014 at 102 $/b and we would claim that the only reason why international oil prices have not already fallen below 100 $/b is to be found in the very large increase in unplanned outages that has happened the last two years. The escalation in outages started with the “Arab Spring” in the winter of 2011. The first material outage came from Libya. Then as Libya came back into the market much quicker than anybody had expected during 2012, Iran fell out of the market with more than 1 million b/d of reduced production and exports due to the European oil embargo and the US/European financial sanctions. Now Libya has again fallen out with more than 1 million b/d reduced output since August, due to strikes and political unrest. Current estimates are that Libya is now producing only 200-300 kbd compared with about 1.35 million b/d during the first half of 2013.

Some have said during the last year that since the Brent price is still above 100 $/b despite the large increase in US shale oil output, these barrels are not as important as we and others have claimed. We would instead turn this around. You could rather ask yourself the question on how high oil prices would have been without the 2.5 million b/d growth in US shale oil we have seen the last 2-3 years. The answer is that there would have been no spare capacity left in the global upstream production space and international oil prices could have been much higher than were they are right now. The shale oil revolution in the US has also already had large geopolitical consequences as the US would never have dared to push Iran as hard as they have through the very large tightening of sanctions had we not seen the massive increase in US shale oil output.

In fact the delta in shut out barrels out of the market has more than offset the increased shale oil output from the US the last two years. The key question to ask would be; will this continue also in 2014 and 2015? We have problems believing that will happen as we are already at a historically high level of shut out barrels as we enter 2014. Shut out barrels right now are almost at par with what we saw during the Venezuelan strike in December 2002 and the war in Iraq that started in March 2003. Should we really expect the shut out barrels to increase from here to levels only seen since the break up of the Soviet Union in the 1990’s? We struggle to have that as a base case. Yes, we could lose some more barrels from Iraq, Venezuela and Nigeria, but we find it easier to believe some barrels will return to the market on the net.

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Global Oil Supply vs Demand in 2014

- Significantly lower “Call on OPEC” in 2014 – The average of the estimates from IEA/OPEC/EIA is a decrease of 0.6 million b/d

The supply-demand balance for 2014 is looking very weak in our opinion. We think global oil demand will increase by 1.1 million b/d while we have non-OPEC supply growth (including biofuels) up 1.7 million b/d. We think the oil demand growth will be about similar to what we have seen in 2013, but the split between OECD and non-OECD will be different. We think OECD oil demand will grow for the first time in 4 years in 2014. For many countries in the OECD, however, we are not talking about net oil demand growth, but rather that the delta in oil demand becomes less negative instead of turning positive.

We think we will continue to see some oil demand growth in the US in 2014, based on more positive macro economic data, but there remains a large risk in how the expected FED tapering will affect the macro economic sentiment during the year. We expect OECD Europe to post a minor net oil demand growth but it can hardly be described as strong by any means. For the third largest oil consumer in the world (Japan), we believe the oil demand growth will continue to be negative, despite “Abenomics” and improving macro economic numbers. Why is that? Well, the country has not started any nuclear facilities yet and if that happens, it should be negative for both direct burn of crude and residual fuel oil used for generating power. As far as we understand there are 12 applications to restart nuclear facilities in Japan and the central government wants to get these reactors back into operation. Local governments have the last world, however, but we expect that during 2014 the Japanese central government will be able to restart at least a handful of nuclear facilities.

In total we expect OECD oil demand growth of 0.1 million b/d for 2014. Now how about the emerging markets? Will these countries continue to grow as strongly as before? We think not. Non-OECD oil demand growth was 1.3 million b/d in 2011, 1.4 million b/d in 2012 and is on track to come in at 1.1 million b/d for 2013. All these numbers are based on IEA data, except we have replaced the IEA numbers for US and China with data reported directly from these two key countries. For 2014 we believe oil demand growth in the non-OECD will continue to weaken to 1.0 million b/d on the back of lower total GDP-growth coupled with what looks to be more service oriented growth rather than the same growth in investments that we have seen for the last ten years. This means the content of the growth in emerging markets will on average be less energy intensive than during the last ten years. This change is already starting to become visible in the oil data: Saudi Arabian oil demand grew 133 kbd in 2012, but is year-to-date up 90 kbd. Similar numbers for China is 355 kbd vs 308 kbd (and the toughest year-on-year comps are in Q4), India is 148 kbd vs 31 kbd, Latin America is 230 kbd vs 214 kbd (and note that the last three months vs the same months the prior year is up only 176 for Latin America). The likely FED tapering could also be a further drag on some of these emerging economies as one would expect their currency to start weaken against the USD as the longer term US interest rates becomes pressured higher when FED scales back its massive buying of US bonds. If we were to evaluate the risks in our demand forecasts we could see some upside risk connected to OECD but there is similar downside risk connected to our non-OECD numbers.

What does the most influential other analysts expect of supply-demand growth for oil in 2014? It is common to compare one’s own numbers with the ones posted from IEA, OPEC and EIA. The average of these agencies estimates of changes to “Call on OPEC” for 2014 is a decrease of 0.6 million b/d for 2014. IEA is the most pessimistic, while OPEC is the least pessimistic. EIA is just in the middle. Looking at what has happened to the average oil price since the change of the millennium it has been common to see a drop in the oil price whenever the “Call on OPEC” falls significantly. That happened in the beginning of the 2000’s, it happened in 2009 and it happened in 2013. It is going to happen also in 2014 in our opinion.

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Global Oil Supply Growth

- Expect a large increase in production outside of OPEC for 2014

The last 5 months we have seen acceleration in the year-on-year growth rates of production for countries outside of OPEC. Non-OPEC growth has in fact posted a sustainable period with growth above 1.5 million b/d for the first time during the last ten years. Most of this growth is of course coming from the shale oil revolution in the US, but the last 5 months the IEA data shows that we are now seeing meaningful growth also without including the US in the non-OPEC numbers. There is even growth if we exclude Canada.

Non-OPEC countries that are now growing includes Oman, Russia, Columbia, Brazil, Mexico, Kazakhstan, Azerbaijan, Ghana, South Sudan and lo and behold, even UK and Norway posted growth last month. The sum of year-on-year production growth for these mentioned countries in October was in fact larger than 850 kbd. We don't think everyone is aware that suddenly we see some production growth in the North Sea, and it does not seem to be due to material new fields starting up but rather better performance from existing fields. As an example we can mention that the loading programme for Q4-2013 for Brent, Forties, Oseberg and Ekofisk (BFOE) in fact was 90 kbd higher than in Q4-2012. We believe the mentioned trends will continue into 2014.

It is important to emphasize that in the oil industry there are normally significant lag times from investment to production and a drop in investments will not immediately lead to lower oil production growth unless the oil price drops to levels that make maintenance on existing oil fields un-economical to execute. According to IEA the break even costs of Enhanced Oil recovery projects span from 20 $/b to 80 $/b. In theory this means that the decline rates should be kept in check as long as the oil price stays above 80 $/b. Some have claimed that if the oil price drops to let's say 70-80 $/b then the resulting drop in investments will quickly push the oil price back up as supply will suffer from these lower investments. The problem with this argument is that it is very difficult to time when the potentially lower investments lead to potentially lower production. As an example, in 1980 the global CAPEX spending peaked and started falling, but it took 4-5 more years until that resulted in flattening non-OPEC output.

From 2002 to 2009 we saw an immense increase in E&P spending in the oil industry. In the same years there were no increases in non-OPEC production. In fact, non-OPEC production outside of the FSU started falling in this period, despite this large increase in spending. We still regularly meet players in the oil industry that claims this is still the best description of the industry, but note that non-OPEC production has now "turned the corner", and again started growing and as already mentioned it is not only confined to onshore USA. It is striking that the large growth in E&P spending from 2002-2009 was mainly all inflation. There was little activity growth. Maybe it should not then be very surprising that production growth started suffering. The last 3-4 years have however been different as now the largest component of the CAPEX increase is related to activity growth and not inflation. Suddenly the last 3-4 years the oil industry has received more "bank for the buck" with respect to its investments. Maybe it should not then be unexpected that the next couple of years will pose better growth in production from non-OPEC?

The key growth in non-OPEC will however continue to come from the US/Canada also in 2014 and 2015 in our opinion. Onshore E&P spending will in 2014 be close to 500 billion USD according to IHS, this is up about 170 billion USD since 2009. In the same period the offshore E&P spending has increased by about 70 billion USD. These investments are about to pay off through increased production and based on the IEA estimates of US production growth compared to when the first assessment was released, the upside surprise to US production the last 2.5 years is so far a massive 1.7 million b/d. More than a new "Norway" has in other words entered the market the last couple of years that the IEA did not have in their estimates in the summer of 2011.

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Global Oil Demand Growth

- Same net growth expected in 2014 as in 2013 but content different – OECD stronger but non-OECD weaker

OECD oil demand growth peaked in 2005-06 and is since down about 10%. We think there could be some pockets of oil demand strength in parts of the OECD in periods where economic growth outpaces the improved efficiency and substitution but we believe these will only be pockets that may last at max 6-12 months. We are still convinced that during the next 5 years, the efficiency improvements in the US car fleet, coupled with substitution in particularly heavy duty trucking will outweigh any positive effect of economic growth in the coming 5-year period. We suspect we will see a period of stronger oil demand growth in the US, maybe at the start of 2014 but the growth in oil demand will not be particularly strong at below 100 kbd for 2014 on average.

For OECD Europe we expect a small growth of about 50 kbd in 2014 after coming in negative at 130 kbd in 2013. Unfortunately (for those selling oil that is) we still see no meaningful evidence of stronger oil demand growth in the key European countries, except in UK. Oil demand is in the latest IEA figures contracting in Germany, France, Spain and Italy. But based on some better sentiment in the macro economic indicators in Europe the last couple of months we choose to have a slightly positive bias to oil demand for 2014 in Europe.

When it comes to oil demand growth in the non-OECD, the delta in the growth rate is in fact looking less positive. After having seen non-OECD oil demand growth performing at 5-8% growth rates for large parts of the period from 2000-2010, the growth rate is now hovering more in the 3-4% range. The last couple of months the demand has in fact grown at only about a 2% rate compared with last year. We have already mentioned the weaker growth rates for oil demand in India, Latin America and Saudi Arabia that we have seen recently. We expect this kind of demand growth to continue also into 2014. A 1.0 million b/d demand growth rate for non-OECD equals about 2.2% oil demand growth for that region.

China will again be the key for non-OECD oil demand growth and we continue to expect weaker growth rates in oil demand for China also for 2014. We have been used to seeing a yearly growth of 0.5 million b/d for China but we have argued many times the last two years that we believe this growth rate will drop to the 300-400 kbd range in the coming years. This year the Chinese oil demand growth is set to come in somewhere between 250-300 kbd, while next year we factor in demand growth of about 350 kbd. The key reason why we are no longer seeing 0.5 million b/d yearly growth in China is that diesel is no longer contributing to positive oil demand growth. As total Chinese GDP growth has dropped to 7% instead of the 10% plus and as the growth becomes less energy intensive, this affects diesel demand negatively. Diesel is also meeting competition from natural gas in the transportation sector and wind, solar and nuclear in the stationary sector. We believe car sales and hence gasoline consumption will continue to perform strongly in China also in both 2014 and 2015, but this will not be enough to offset the fact that diesel is not performing anymore.

We would also like to highlight the fact that in some of the most populous countries in emerging Asia, the oil price has climbed to heights were several countries can no longer afford to subsidise petroleum products to their citizens to the same extent as before. The best example is Indonesia, which use 14.5% of their domestic budget on petroleum subsidies. On the 22cond of June the country removed parts of their subsidies on diesel and gasoline and the prices on these products jumped 20% to 40% for the end users. Then it will become possible to do some sensitivity analysis based on prices in such a country. India and Malaysia have also started scaling back petroleum subsidies in 2013. This will not hinder further demand growth for petroleum but the growth rate will most likely not be as strong as we have been used to. You can try to tell Indonesia, India and Malaysia that oil is cheap. They will not agree with you…

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The Cost Of The Marginal Oil Barrels

- Loads of new numbers floating around recently for the cost of US shale oil production (or Light Tight Oil if you want)

One of our key premises to expect still a high oil price by historical standards also for the coming 5 years has been that the cost of extracting shale oil in the US will only fall marginally in the coming years. For most of 2013 the break even numbers floating around for the key projects in the US shale oil industry has been in the 70-85 $/b range. IEA has shale oil break even costs ranging from 50 $/b to 100 $/b in the World Energy Outlook published in November. But what if the key projects are moving to the lower end of the range?

Recently Lynn helms, the head of North Dakota's Department of Mineral Resources stated that 86% of the state's output has break even prices of 45 $/b or lower. This is much lower numbers that we have seen in earlier calculations. The break even price includes 10 % cost of capital and is after tax and royalties according to the Department. The break even prices for the top 4 counties in the Bakken field was said to be 40 $/b for Williams, 37 $/b for Mountrail, 26 $/b for McKenzie and 31 $/b for Dunn. These are low numbers, but note that they would be well-head break evens which means you will have to add maybe 5-15 $/b in transportation costs to reach a refinery. Still if the break even costs to reach the sea is 45 $/b plus 15 $/b, this is lower than the estimates we have operated with so far. We will probably have a test of the North Dakota Break even prices when we get the reported November numbers from the oil industry in North Dakota because in November the price for Bakken crude oil into the Clearbrook pipeline system was about 80 $/b. If this price was not low enough to dent any activity in the Bakken it may indicate that the break even costs are on their way down rather than up in North Dakota. According to Wood Mackenzie the break even price for Bakken is at 62 $/b. Also this is meaningfully lower than the 77 $/b we have been leaning on as the average Bakken break even price calculated by PIRA Energy. PIRA is however telling us that they are about to revise their break even calculations for the Bakken lower these days.

There are many numbers floating around and what we should probably focus on is the development reported by the key players in the shale industry. It is probably not very relevant to put any weight on what small insignificant producers may report of IP-rates, break even costs, drilling time, etc, etc. In the US shale oil industry (note this is not shale gas) there are 25 players that are behind most of the volume produced. We have made a list of these players in the Appendix. The largest shale oil player is by far EOG, but other players are on the rise. Note that this list of 25 players only includes 3 International Oil Companies (NOC's). This industry is in other words not at all driven by the large international integrated oil companies. Note that Royal Dutch Shell is not at the list at all. The largest of the oil supermajors is ConocoPhilips. Our point is that if you wish to follow the broad development of costs and efficiency in this industry you should focus on the 25 names mentioned in the Appendix. Don't waste effort in looking at the development for the very small players (unless you are evaluating investing directly in them of course…)

We are a subscriber to IHS quarterly upstream spend report. The latest report includes a rather disturbing table (if you are from Norway…). IHS lists typical break even prices for oil & gas projects around the world and the disturbing numbers (for a Norwegian) is that IHS has Norway at 67 $/b and US Tight Oil at 60 $/b, both with a 15% cost of capital. SAGD, the Steam Assisted Gravity Drainage in Canada is also listed at 67 $/b in the table. Maybe Norway needs to work to get the costs down…

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Appendix

Graphs & pictures to underpin the story

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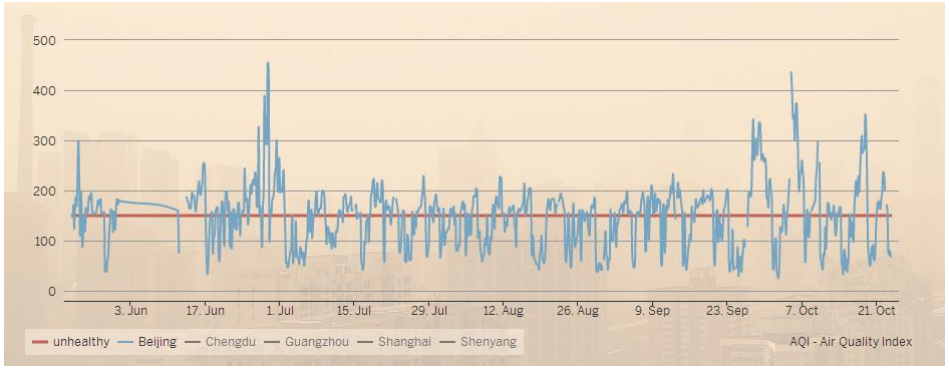
Chinese Air Pollution Getting Out Of Control

- An index above 150 is “unhealthy”, above 200 is “very unhealthy”, above 300 is “hazardous”



China’s LNG refilling station construction boom

China witnessed an LNG refuelling station constriction boom in the first three quarters of this year, in line with the government’s policy to increase cleaner fuel use in transportation.

Sources have said that by the end of September, China had 1,700 LNG refilling stations in operation, up from 1,325 by the end of the second quarter. The three regions and provinces with the largest number of stations are Xinjiang, Hebei and Guangdong.

The ramp-up in station construction has been spurred on by government calls to prioritise gas use so as to meet vehicle emission targets for 2015 set out in the country’s Clean Air Act. The bulk of the stations being built are by the country’s top three state-owned majors – China National Petroleum Corp. (CNPC), Sinopec Group and China National Offshore Oil Corp. (CNOOC). CNPC itself intends to add 5,000 LNG stations across the country by 2015, including 248 in central China’s Henan Province.

By the end of 2012, the number of LNG-fuelled vehicles on China’s roads had reached 80,000 units, up from 38,500 units in 2011.

In Guangzhou, Guangdong Province’s capital, local authorities plan to retrofit 6,500 LPG-fuelled buses over the next eight years to run on LNG, with 1,600 of that number slated to be switched over this year.

China’s gas demand was growing by 20% per year until 2011, with growth slowing to 10.6% in 2012 as a result of an economic restructuring that slowed some of the country’s industrial development. According to the country’s 12th Five-Year Plan (2011-15), China’s gas demand will reach 230 billion cubic metres by 2015.

In addition to imports, for LNG refuelling stations will source a significant portion of their supply from trains operated by independent investors and distributors such as ENN and Xinjiang Guanghui. ■

Source: Financial Times

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The Huge US Oil-Gas Spread Provides Substitution Possibilities

-General Motors will soon produce dual fuel pick ups and trucks that can switch between gasoline and CNG

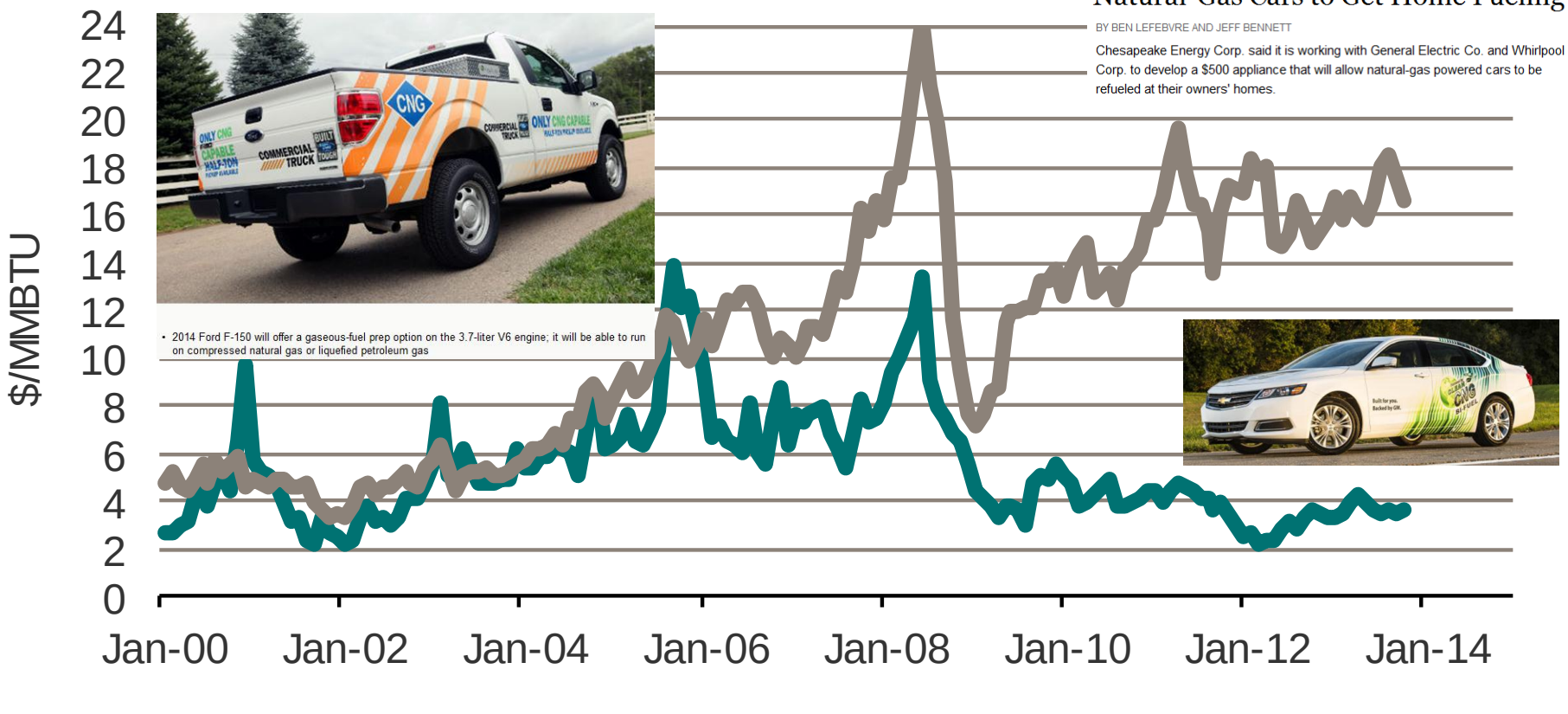
• 2014 Ford F-150 will offer a gaseous-fuel prep option on the 3.7-liter V6 engine; it will be able to run on compressed natural gas or liquefied petroleum gas

THE WALL STREET JOURNAL.
EUROPE EDITION ▾ Tuesday, November 13, 2012 As of 6:14 PM EST

Natural-Gas Cars to Get Home Fueling

BY BEN LEFEBVRE AND JEFF BENNETT

Chesapeake Energy Corp. said it is working with General Electric Co. and Whirlpool Corp. to develop a $500 appliance that will allow natural-gas powered cars to be refueled at their owners' homes.



Source: Reuters

Key Economic Impacts Relative to the Zero Exports Case

Impact (2016-2035 Averages)*	LNG Export Case (Change from Zero Exports Case)		
	ICF Base Case (up to ~4 Bcfd)	Middle Exports Case (up to ~8 Bcfd)	High Exports Case (up to ~16 Bcfd)
Employment Change (No.)	73,100-145,100	112,800-230,200	220,100-452,300
GDP Change (2010$ Billion)	$15.6-$22.8	$25.4-$37.2	$50.3-$73.6
Henry Hub Price (2010$/MMBtu)	$5.03	$5.30	$5.73
Henry Hub Price Change (2010$/MMBtu)	$0.32	$0.59	$1.02

*Source: ICF estimates. Note: * Includes direct, indirect, and induced impacts*

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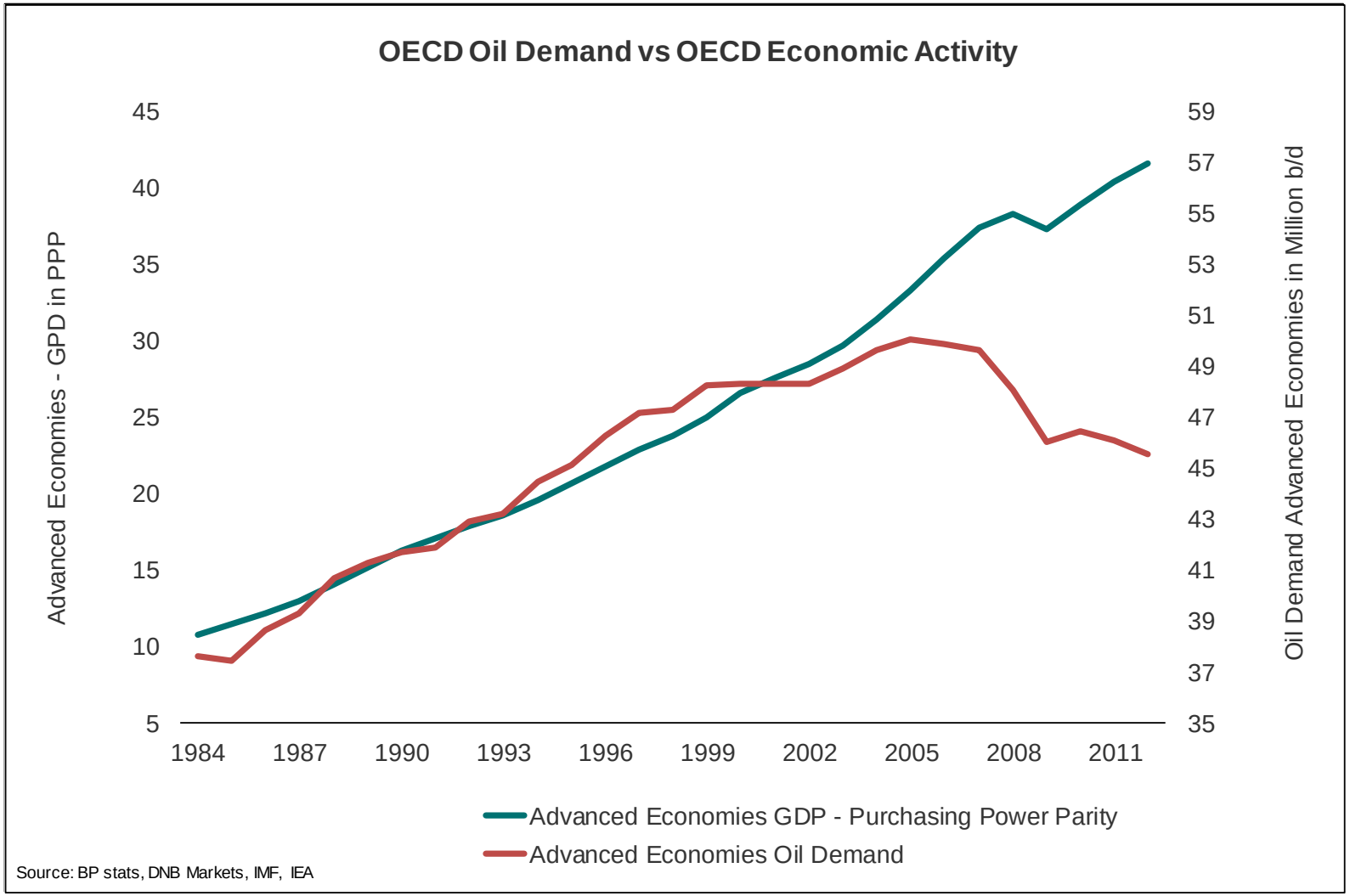
GDP Growth In OECD No Longer Provide Growth In Oil Demand

- The high and rising oil price has started irreversible negative effects on demand for refined oil products in advanced economies



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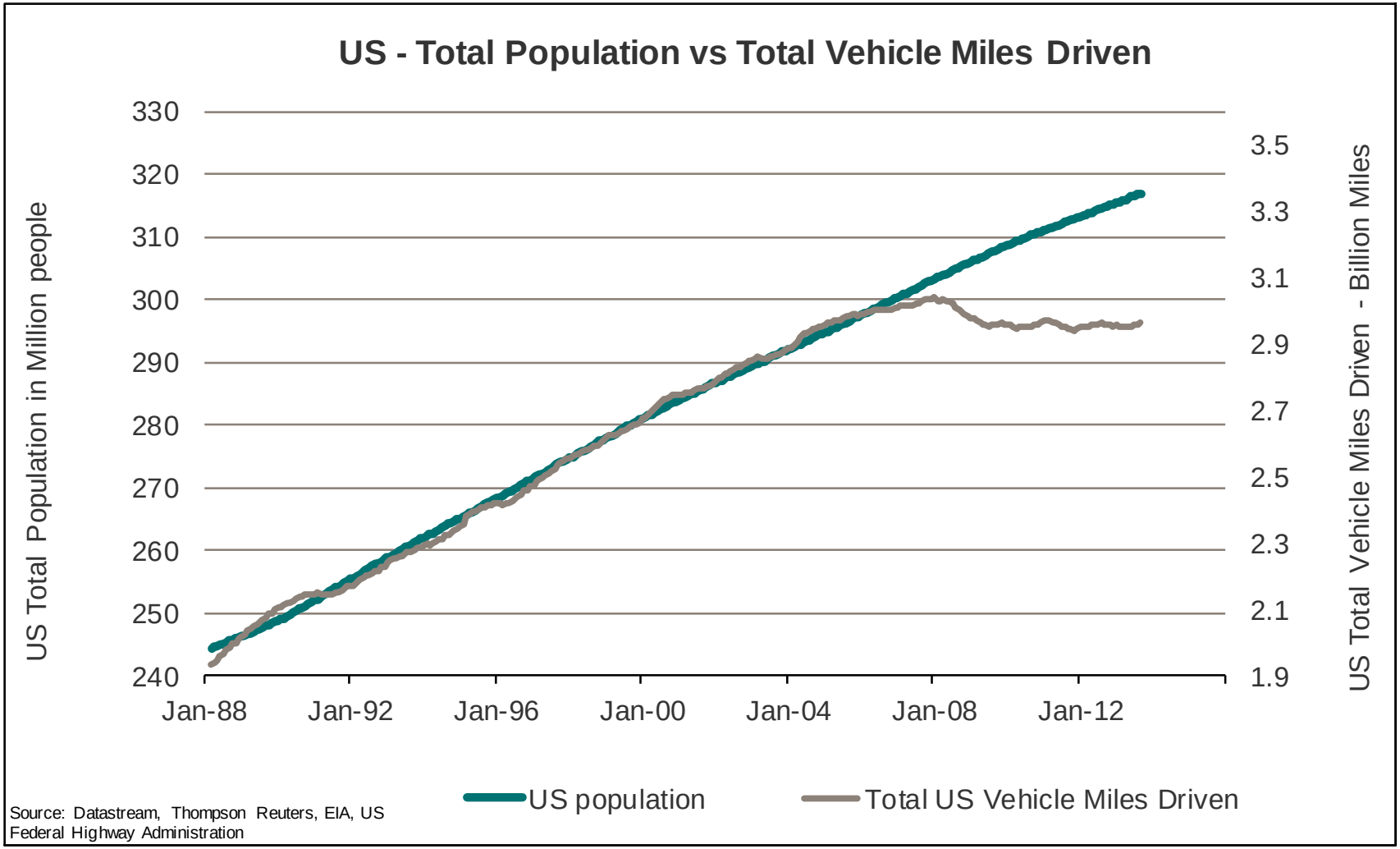
Decade Old Relationships Breaking Apart

- Why this break up between driven length and size of the population? Structural or cyclical reasons??



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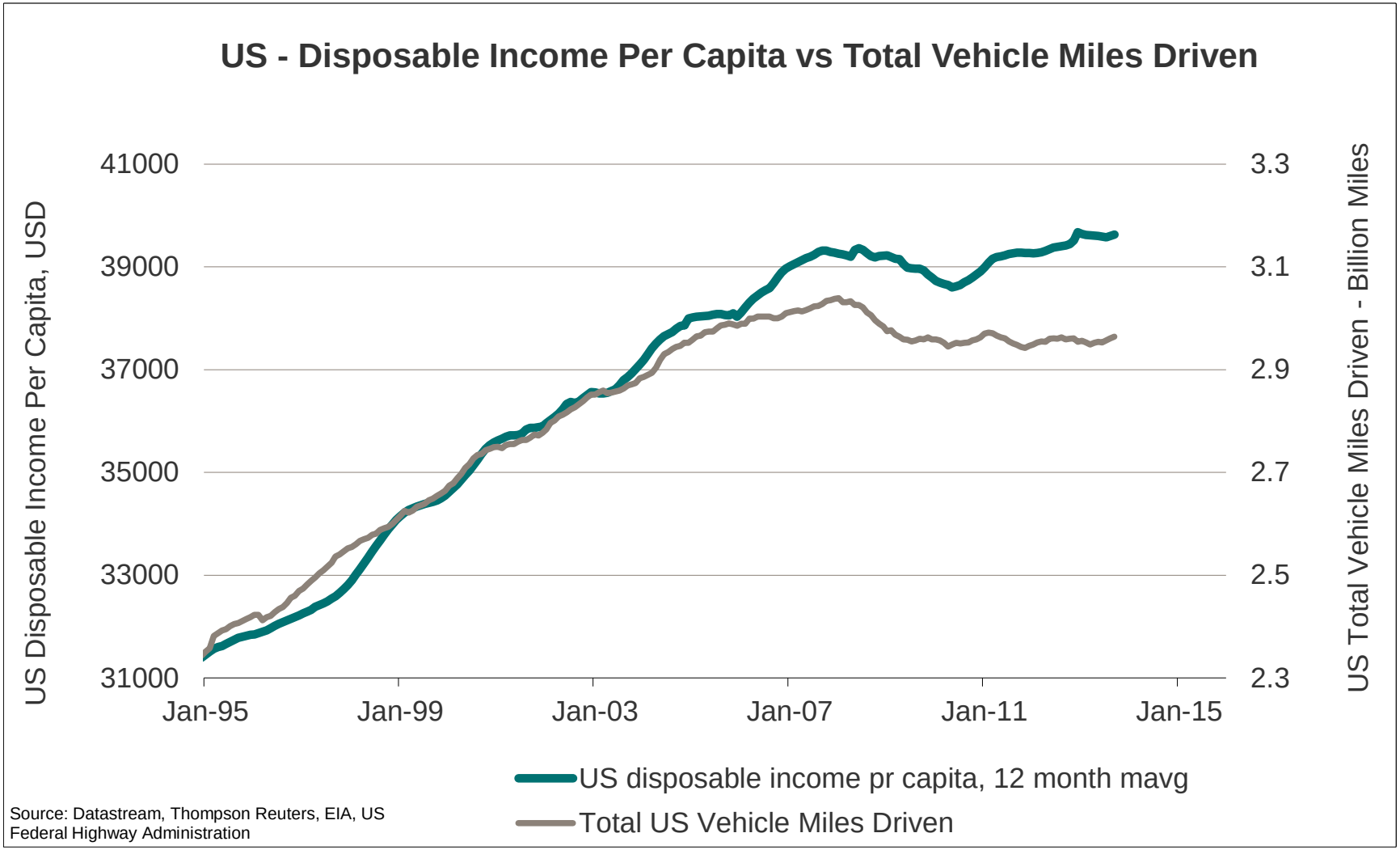
Disposable Income Has Improved But Not Affected Total Driving

- Had this had been purely cyclical, then total driving should have followed the development in disposable income per capita



Source: Datastream, Thompson Reuters, EIA, US Federal Highway Administration

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US Fuel Efficiency Standards To Significantly Improve By 2025

-CAFE-standards to reach 49.6 MPG by 2025

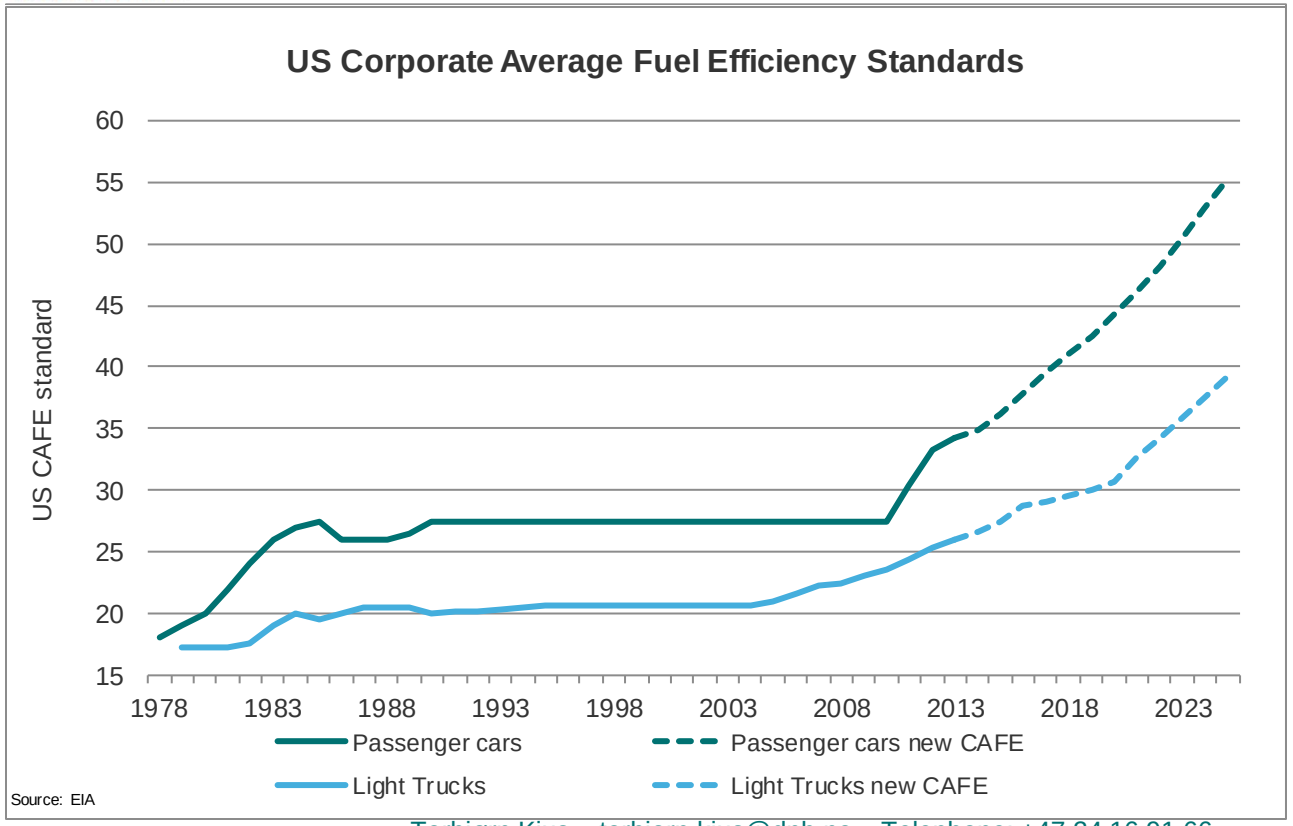
The formal proposal follows President Obama's agreement with 13 major automakers, announced in July, to gradually boost these vehicles' fuel economy to the equivalent of 54.5 miles per gallon -- up from the current standard of 27.3 mpg. Last year, the administration finalized rules to hike the standard to 35.5 mpg by 2016.

CAPTION By Brendan Smialowski, Getty Images

Source: EPA/Department of Transportation Corporate Average Fuel Economy Standards; Final Rule – July 2010

TABLE I.B.2–1—AVERAGE REQUIRED FUEL ECONOMY (mpg) UNDER FINAL CAFE STANDARDS

	2011-base	2012	2013	2014	2015	2016
Passenger Cars	30.4	33.3	34.2	34.9	36.2	37.8
Light Trucks	24.4	25.4	26.0	26.6	27.5	28.8
Combined Cars & Trucks	27.6	29.7	30.5	31.3	32.6	34.1



Source: EIA

Source: Annual Energy Outlook – EIA April 2013

Table 1. NHTSA projected average fleet-wide CAFE compliance levels (miles per gallon) for passenger cars and light-duty trucks, model years 2017-2025, based on the model year 2010 baseline fleet

Model year	Passenger cars	Light-duty trucks	Combined
2017	39.6	29.1	35.1
2018	41.1	29.6	36.1
2019	42.5	30.0	37.1
2020	44.2	30.6	38.3
2021	46.1	32.6	40.3
2022	48.2	34.2	42.3
2023	50.5	35.8	44.3
2024	52.9	37.5	46.5
2025	55.3	39.3	48.7

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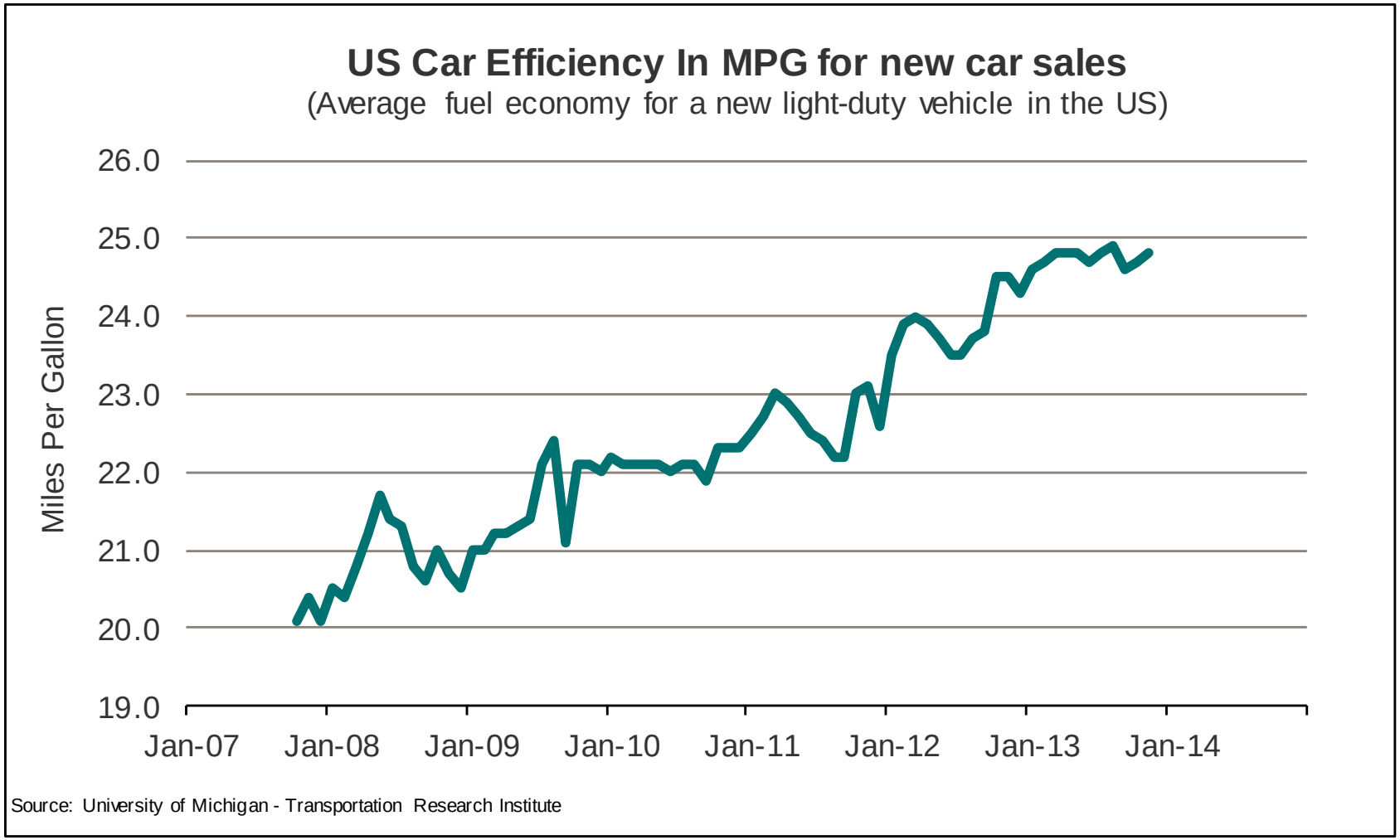
University Of Michigan Confirms The Trend

- US vehicle fuel efficiency for new sold Light Duty Vehicles continue to trend upwards



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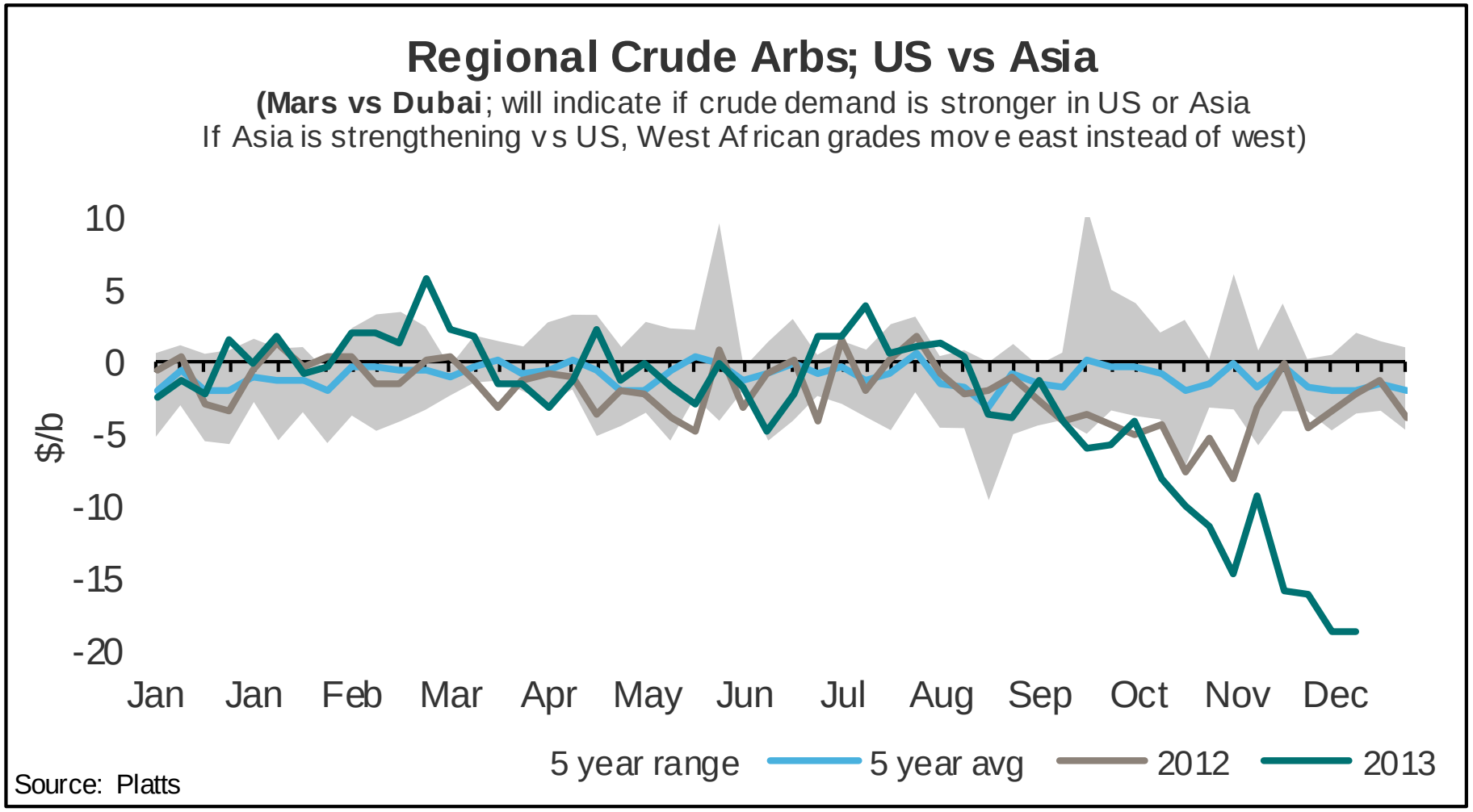
Swing Exporters Moving East Or West?

-Mars in the US GOM vs Dubai in Asia



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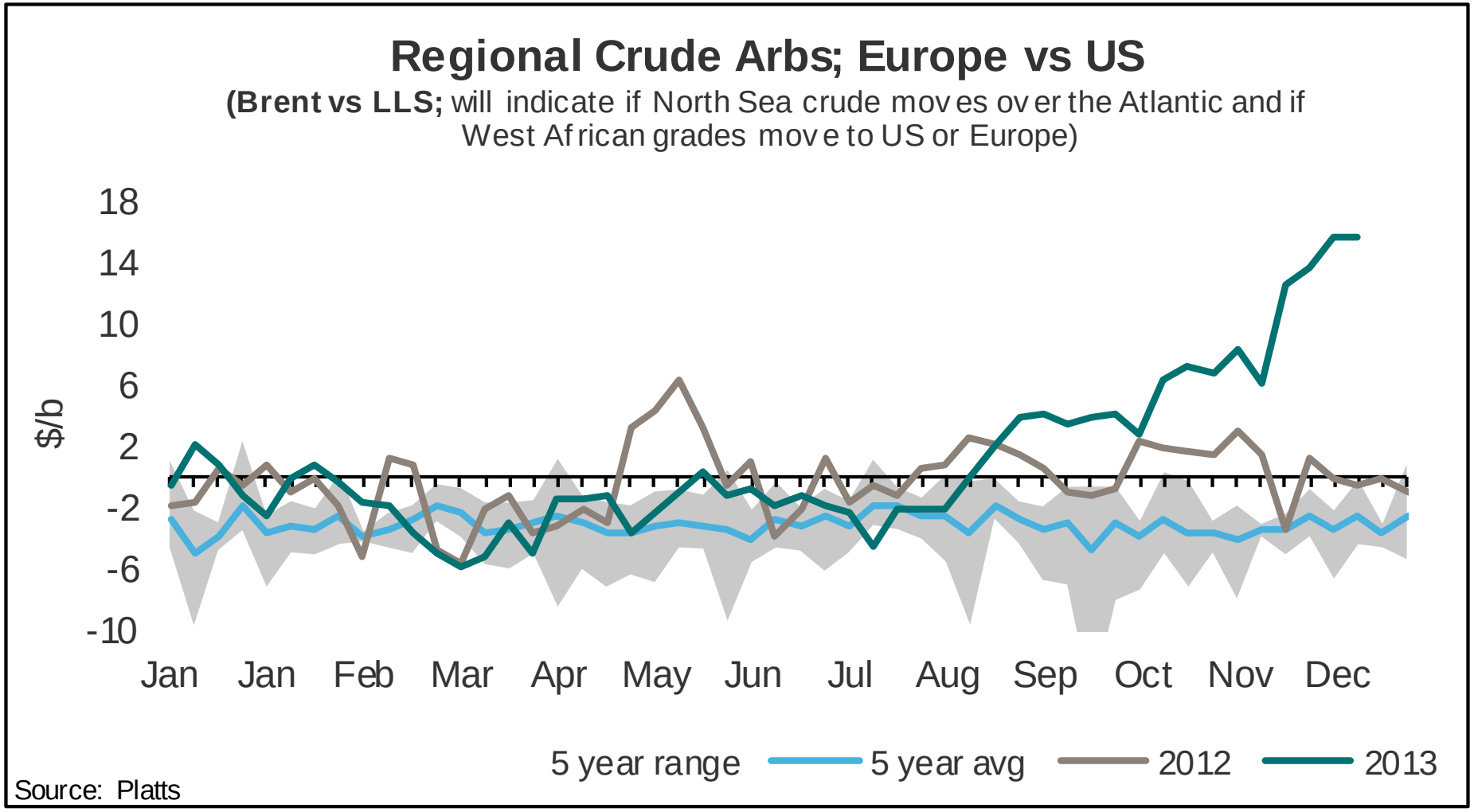
Brent vs LLS Will Indicate If The US GOM Is Over Supplied

-If Brent price above LLS more West African barrels should head towards Europe instead of towards the US



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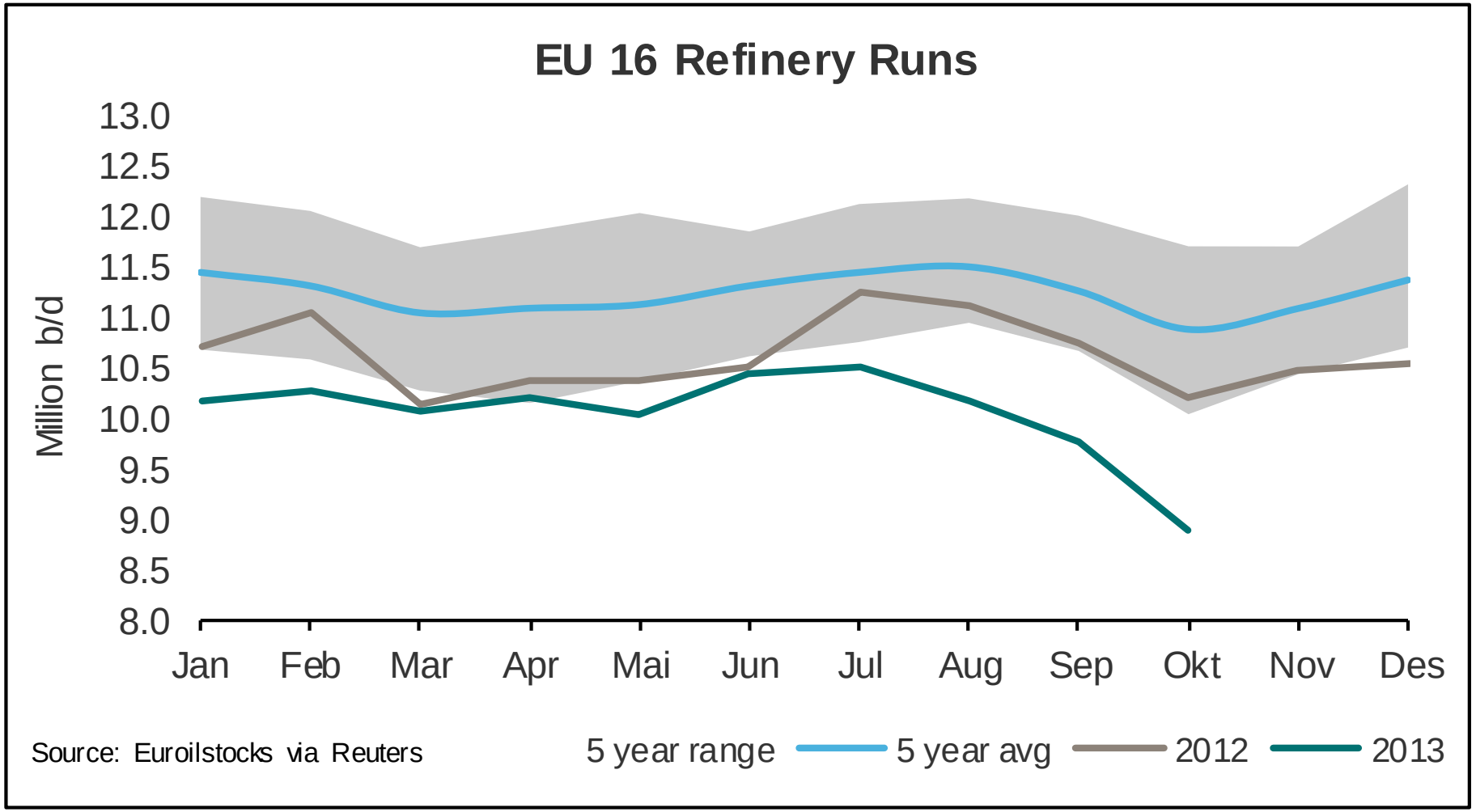
European Refining Is Hammered Down

- EU 16 refinery throughput down 1.3 mbd (13%) since last year



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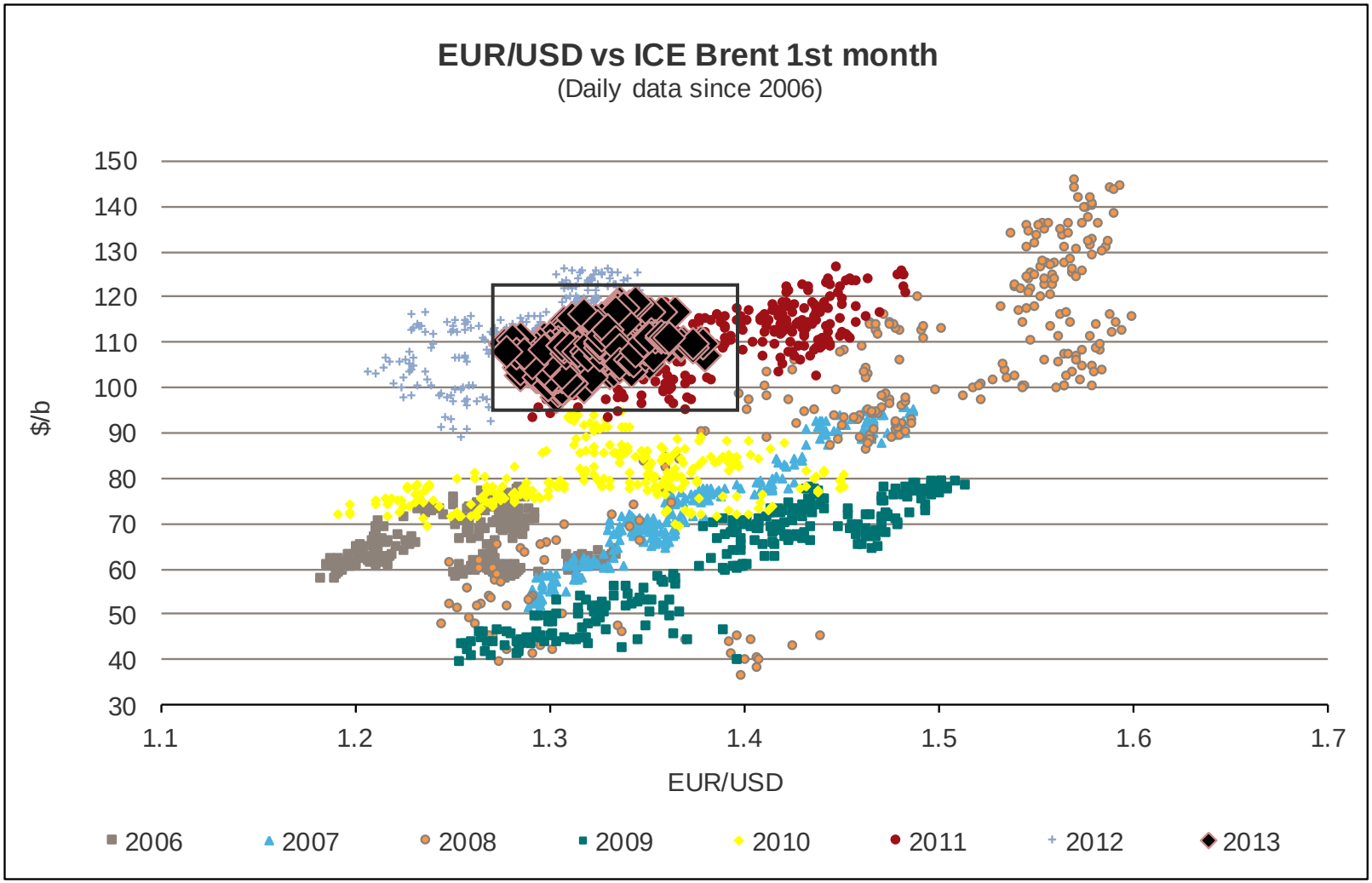
No Influence From The USD-movements Anymore

- Does not matter for the oil price if EUR/USD is 1.28 or 1.38



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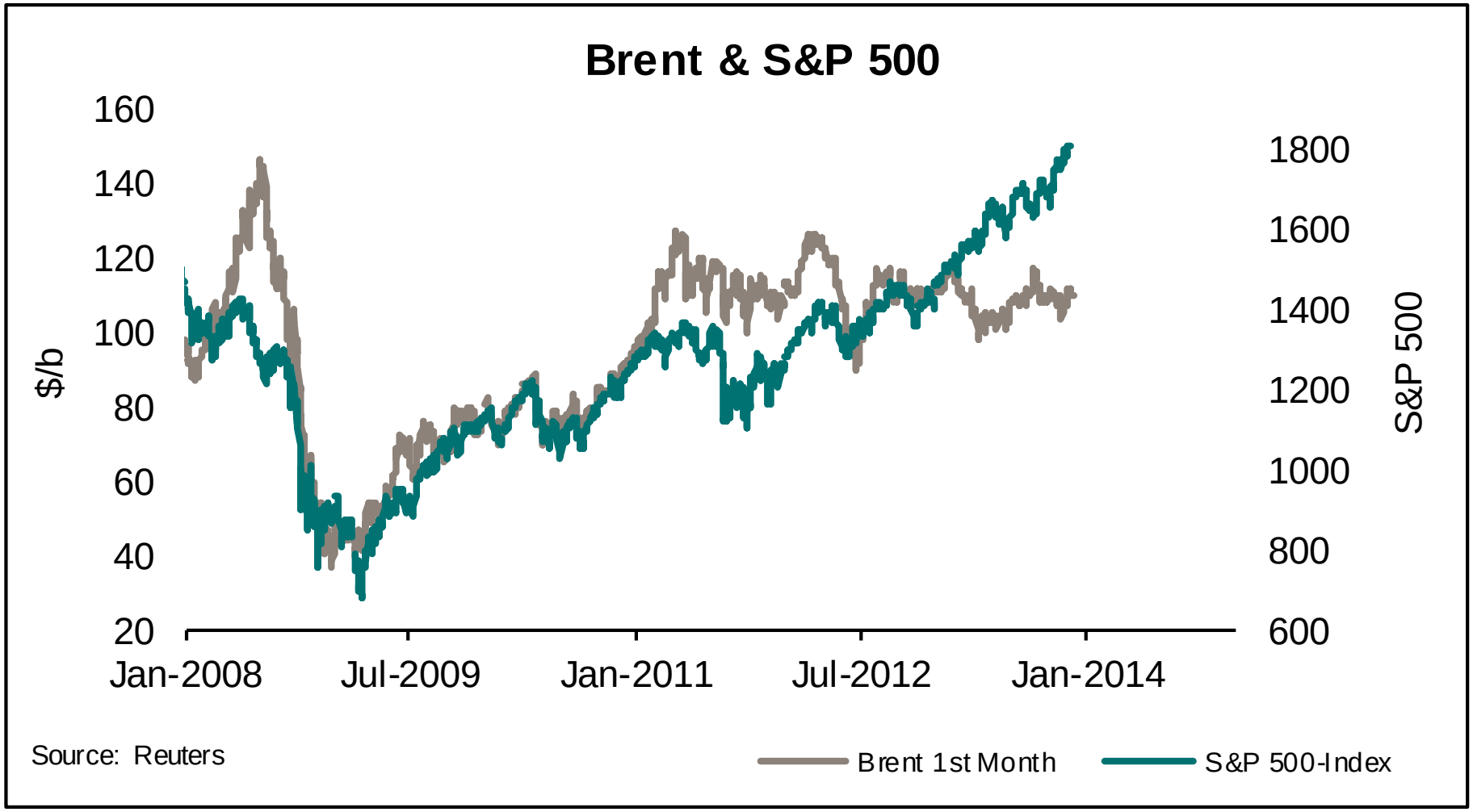
Total Disconnection Between The Equity Market And Oil Prices

- S&P posting new records in 2013 while oil prices are trending lower



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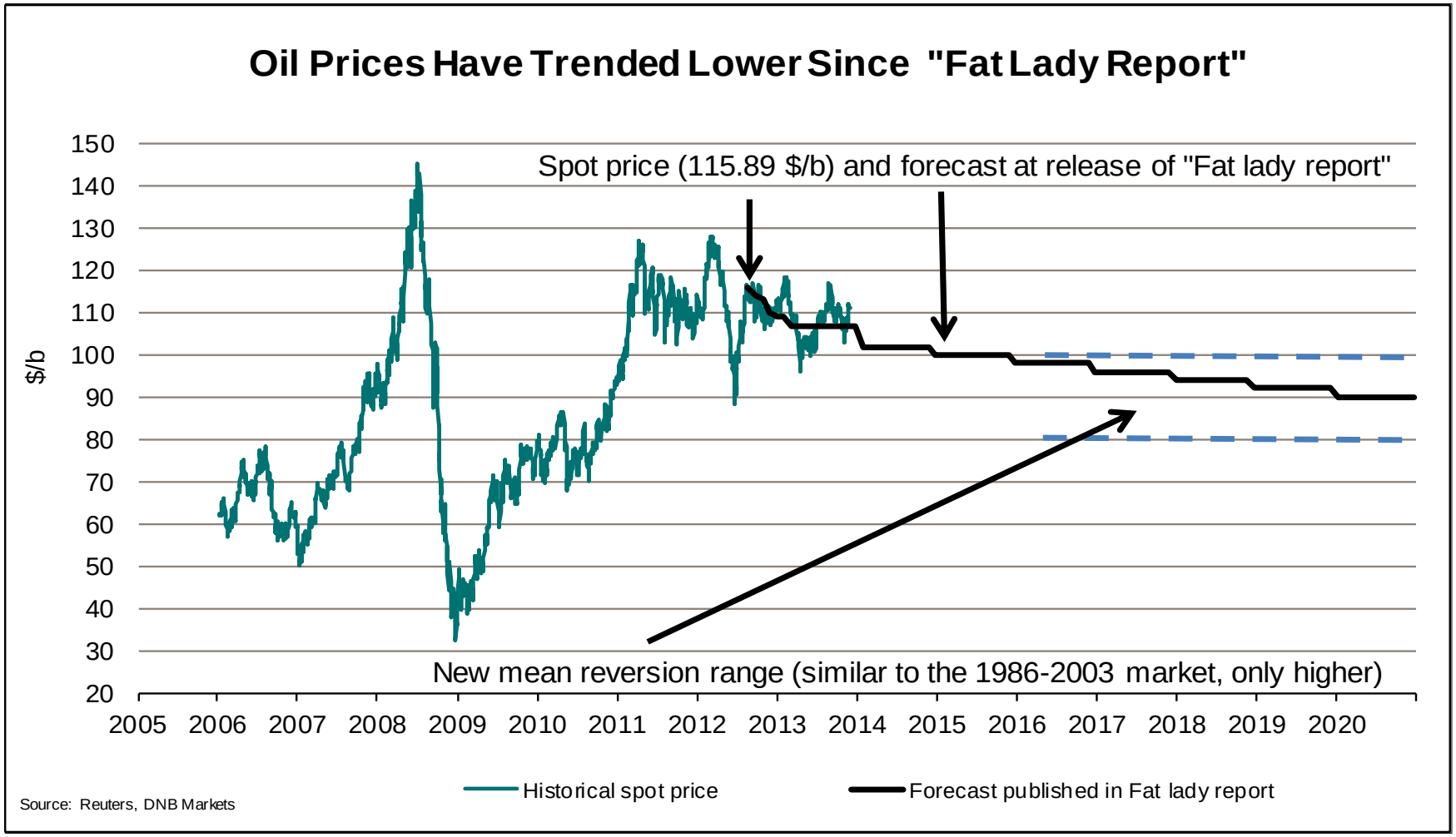
What Has Happened To Oil Prices Since “The Fat Lady Report”

- The market has continued to overshoot and undershoot, but has trended lower



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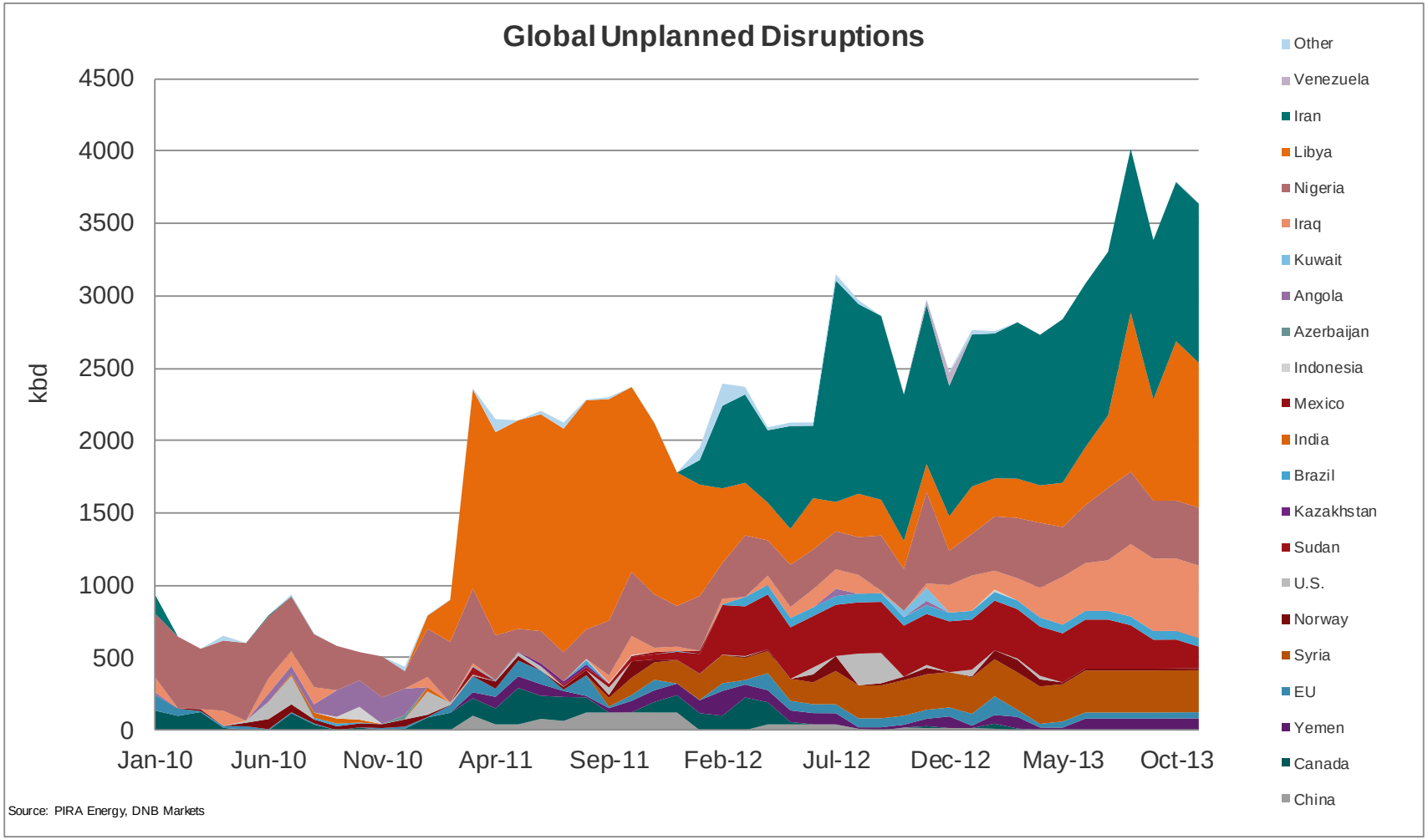
Global Supply Disruptions Have Been Growing

- Will unplanned outages continue at the current high level for the coming 5-years?? What happens if these barrels return?



Source: PIRA Energy, DNB Markets

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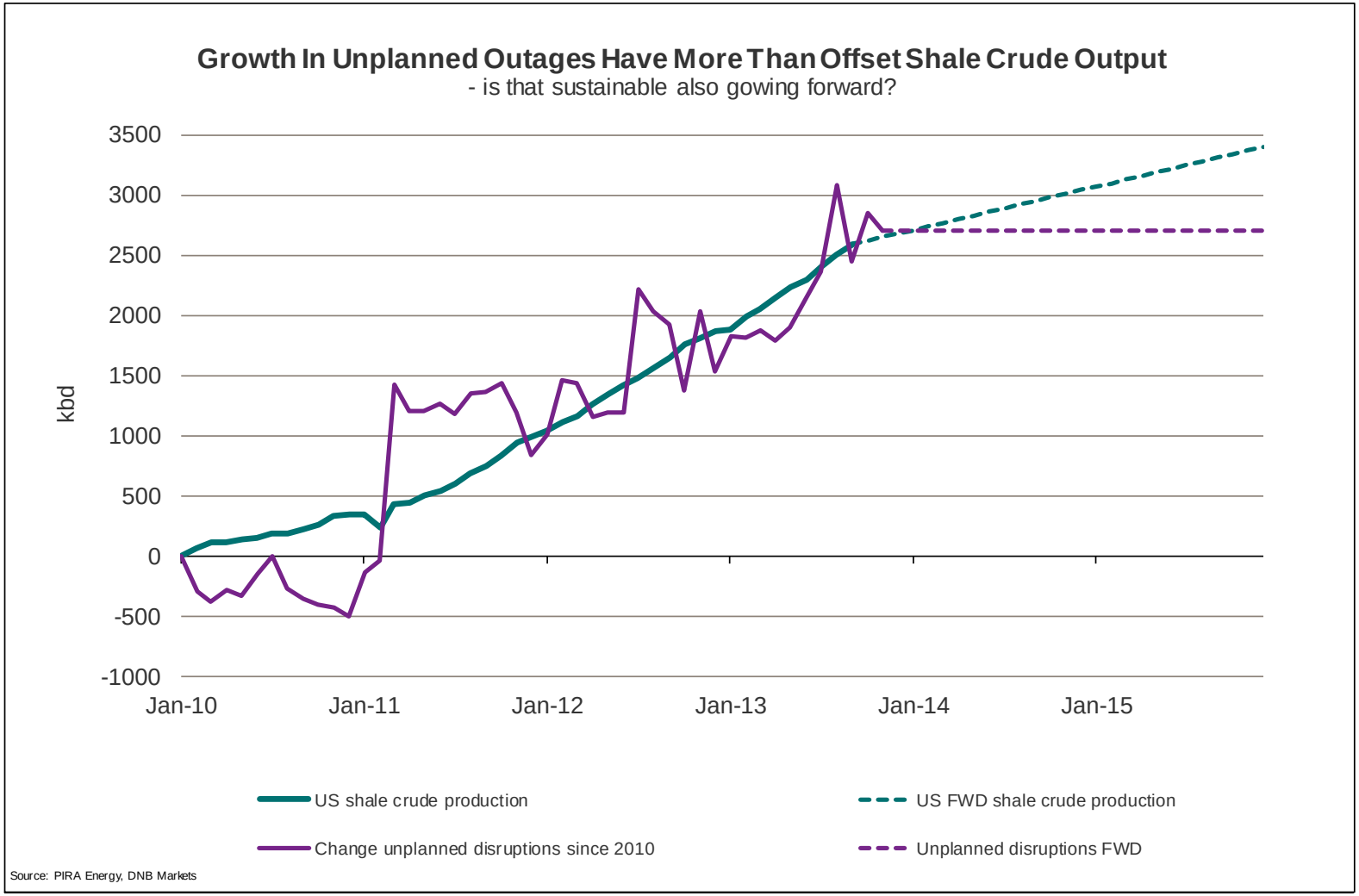
Shale Crude Output Growth Has Been Offset By Outages

- Shale crude production growth is starting to catch up – What happens next three years with unplanned outages??



Source: PIRA Energy, DNB Markets

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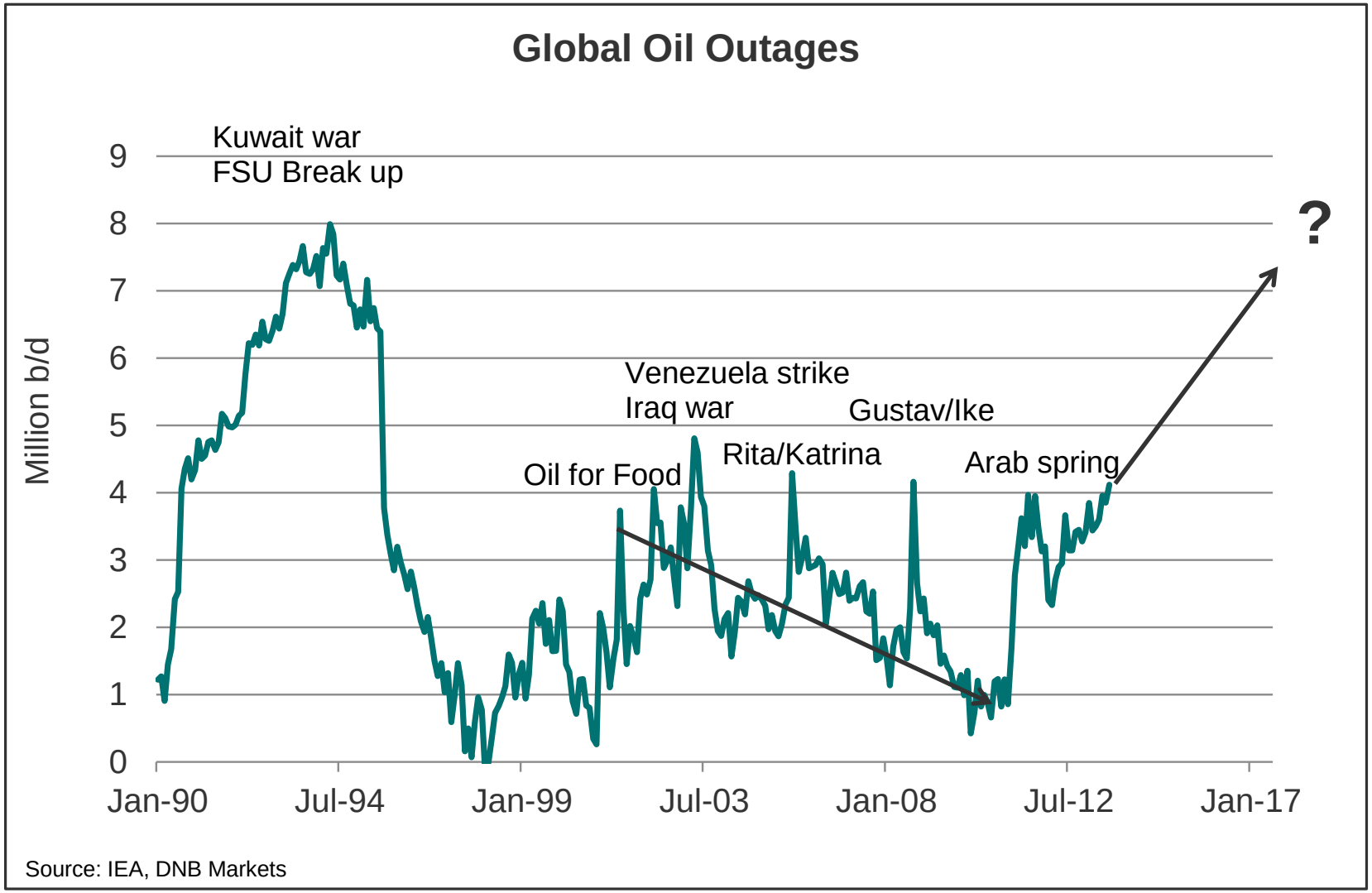
Global Unplanned Outages Are At A Historically High Level

- If you are bullish for the next three years the premise must be further increased outages in our opinion. Will that happen?



Source: IEA, DNB Markets

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Fundamental Balances DNB Markets vs IEA, OPEC, EIA

DNB Markets World Oil Supply-Demand Balance:	2008	Change	2009	Change	2010	Change	2011	Change	2012	Change	2013	Change	2014
OECD Demand	48.1	-2.0	46.1	0.6	46.7	-0.6	46.1	-0.5	45.6	0.0	45.6	0.1	45.7
Non-OECD Demand	37.7	1.2	38.9	2.2	41.1	1.3	42.4	1.4	43.8	1.1	44.9	1.0	45.9
Total Demand	**85.8**	**-0.8**	**85.0**	**2.9**	**87.9**	**0.6**	**88.5**	**0.9**	**89.4**	**1.1**	**90.5**	**1.1**	**91.6**
Non-OPEC Supply	49.2	0.6	49.9	1.0	50.8	0.2	51.0	0.5	51.5	1.2	52.7	1.5	54.2
OPEC NGL's and non-conventional oil	4.5	0.6	5.1	0.5	5.6	0.4	5.9	0.4	6.3	0.1	6.4	0.2	6.6
Global Biofuels	1.4	0.2	1.6	0.2	1.8	0.0	1.9	0.0	1.9	0.1	2.0	0.2	2.2
Total Non-OPEC supply	**55.2**	**1.4**	**56.5**	**1.7**	**58.2**	**0.5**	**58.8**	**0.9**	**59.6**	**1.4**	**61.1**	**1.9**	**62.9**
Call on OPEC crude (and stocks)	**30.7**	**-2.2**	**28.5**	**1.2**	**29.7**	**0.1**	**29.8**	**0.0**	**29.8**	**-0.3**	**29.5**	**-0.7**	**28.7**
OPEC Crude Oil Supply (Last known number dragged fwd)	31.6	-2.5	29.1	0.1	29.2	0.7	29.9	1.4	31.3	-0.9	30.4	-0.5	29.9
Implied World Oil Stock Change	**1.0**		**0.6**		**-0.5**		**0.1**		**1.5**		**1.0**		**1.2**

IEA World Oil Supply-Demand Balance (Nov 2013):	2008	Change	2009	Change	2010	Change	2011	Change	2012	Change	2013	Change	2014
OECD Demand	48.4	-2.0	46.4	0.6	47.0	-0.5	46.5	-0.5	45.9	-0.2	45.7	-0.3	45.5
Non-OECD Demand	37.9	1.2	39.1	2.3	41.4	1.1	42.5	1.6	44.1	1.3	45.3	1.4	46.7
Total Demand	**86.3**	**-0.8**	**85.5**	**2.9**	**88.4**	**0.6**	**89.0**	**1.0**	**90.0**	**1.0**	**91.0**	**1.1**	**92.1**
Non-OPEC Supply	49.2	0.6	49.9	1.0	50.8	0.2	51.0	0.5	51.5	1.2	52.7	1.7	54.4
OPEC NGL's and non-conventional oil	4.5	0.6	5.1	0.5	5.6	0.4	5.9	0.4	6.3	0.1	6.4	0.2	6.6
Global Biofuels	1.4	0.2	1.6	0.2	1.8	0.0	1.9	0.0	1.9	0.1	2.0	0.1	2.1
Total Non-OPEC supply	**55.2**	**1.4**	**56.5**	**1.7**	**58.2**	**0.5**	**58.8**	**0.9**	**59.6**	**1.4**	**61.1**	**2.0**	**63.1**
Call on OPEC crude (and stocks)	**31.2**	**-2.2**	**28.9**	**1.2**	**30.2**	**0.0**	**30.2**	**0.2**	**30.4**	**-0.4**	**30.0**	**-0.9**	**29.1**
OPEC Crude Oil Supply (Last known number dragged fwd)	31.6	-2.5	29.1	0.1	29.2	0.7	29.9	1.4	31.3	-0.9	30.4	-0.5	29.9
Implied World Oil Stock Change	**0.5**		**0.2**		**-1.0**		**-0.3**		**0.9**		**0.4**		**0.8**

OPEC World Oil Supply-Demand Balance (Nov 2013):	2008	Change	2009	Change	2010	Change	2011	Change	2012	Change	2013	Change	2014
OECD Demand	48.4	-2.0	46.4	0.6	47.0	-0.5	46.5	-0.5	46.0	-0.3	45.7	-0.2	45.5
Non-OECD Demand	37.7	0.7	38.4	1.9	40.3	1.3	41.6	1.3	42.9	1.2	44.1	1.2	45.3
Total Demand	**86.1**	**-1.3**	**84.8**	**2.5**	**87.3**	**0.8**	**88.1**	**0.8**	**88.9**	**0.9**	**89.8**	**1.0**	**90.8**
Non-OPEC Supply (Incl all Biofuel)	50.4	0.7	51.1	1.2	52.3	0.1	52.4	0.5	52.9	1.2	54.1	1.2	55.3
OPEC NGL's and non-conventional oil	4.1	0.2	4.3	0.7	5.0	0.4	5.4	0.2	5.6	0.2	5.8	0.1	5.9
Total Non-OPEC supply	**54.5**	**0.9**	**55.4**	**1.9**	**57.3**	**0.5**	**57.8**	**0.7**	**58.5**	**1.4**	**59.9**	**1.3**	**61.2**
Call on OPEC crude (and stocks)	**31.6**	**-2.2**	**29.4**	**0.6**	**30.0**	**0.3**	**30.3**	**0.1**	**30.4**	**-0.5**	**29.9**	**-0.3**	**29.6**
OPEC Crude Oil Supply (Last known number dragged fwd)	31.2	-2.5	28.7	0.5	29.2	0.7	29.9	1.4	31.3	-0.9	30.4	-0.5	29.9
Implied World Oil Stock Change	**-0.4**		**-0.7**		**-0.8**		**-0.4**		**0.9**		**0.5**		**0.3**

EIA World Oil Supply-Demand balance (Nov 2013):	2008	Change	2009	Change	2010	Change	2011	Change	2012	Change	2013	Change	2014
OECD Demand	47.6	-2.2	45.4	0.7	46.1	-0.3	45.8	0.1	45.9	-0.1	45.8	-0.2	45.6
Non-OECD Demand	38.2	0.7	38.9	2.1	41.0	1.5	42.5	0.8	43.3	1.2	44.4	1.3	45.8
Total Demand	**85.8**	**-1.5**	**84.3**	**2.7**	**87.1**	**1.2**	**88.3**	**0.9**	**89.2**	**1.1**	**90.2**	**1.1**	**91.4**
Non-OPEC Supply (Incl all Biofuel)	49.7	0.8	50.5	1.3	51.8	0.2	52.0	0.7	52.7	1.6	54.2	1.5	55.7
OPEC NGL's and non-conventional oil	4.5	0.3	4.8	0.8	5.5	-0.3	5.3	0.5	5.8	0.1	5.8	0.3	6.1
Total Non-OPEC supply	**54.1**	**1.1**	**55.2**	**2.1**	**57.3**	**-0.1**	**57.2**	**1.2**	**58.4**	**1.6**	**60.1**	**1.8**	**61.8**
Call on OPEC crude (and stocks)	**31.7**	**-2.6**	**29.1**	**0.7**	**29.8**	**1.3**	**31.1**	**-0.3**	**30.8**	**-0.6**	**30.2**	**-0.6**	**29.6**
OPEC Crude Oil Supply (Last known number dragged fwd)	31.3	-2.2	29.1	0.1	29.2	0.7	29.9	1.4	31.3	-0.9	30.4	-0.5	29.9
Implied World Oil Stock Change	**-0.4**		**0.0**		**-0.6**		**-1.1**		**0.6**		**0.2**		**0.3**

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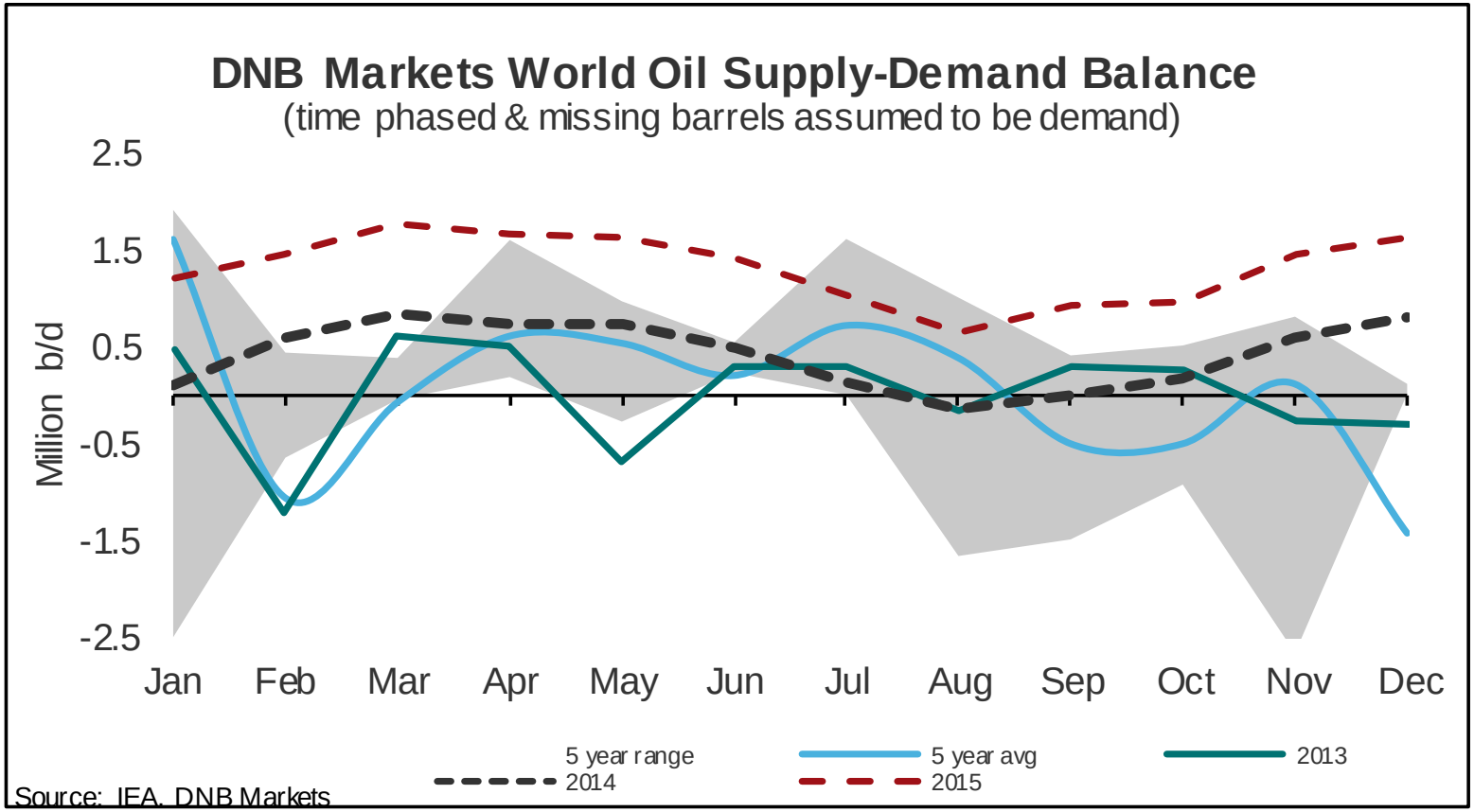
Oil Supply/Demand Balance - Weakening



Source: IEA, DNB Markets

Current Trend Line Figures	Trend Line Growth	2012	2013	2014	2015	2012-15 change
OECD demand	**-0.7%**	45.9	45.6	45.3	45.0	**-1.0**
Non-OECD demand:	**3.1%**	44.1	45.4	46.8	48.3	**4.2**
Total demand		90.0	91.0	92.1	93.3	**3.3**
Demand change:			**1.0**	**1.1**	**1.1**	
Non-OPEC (incl. biofuels)	**2.4%**	55.2	56.5	57.9	59.3	**4.1**
Call on OPEC incl. NGLs		34.8	34.5	34.2	34.0	**-0.8**
Change in Call on OPEC			**-0.3**	**-0.3**	**-0.3**	

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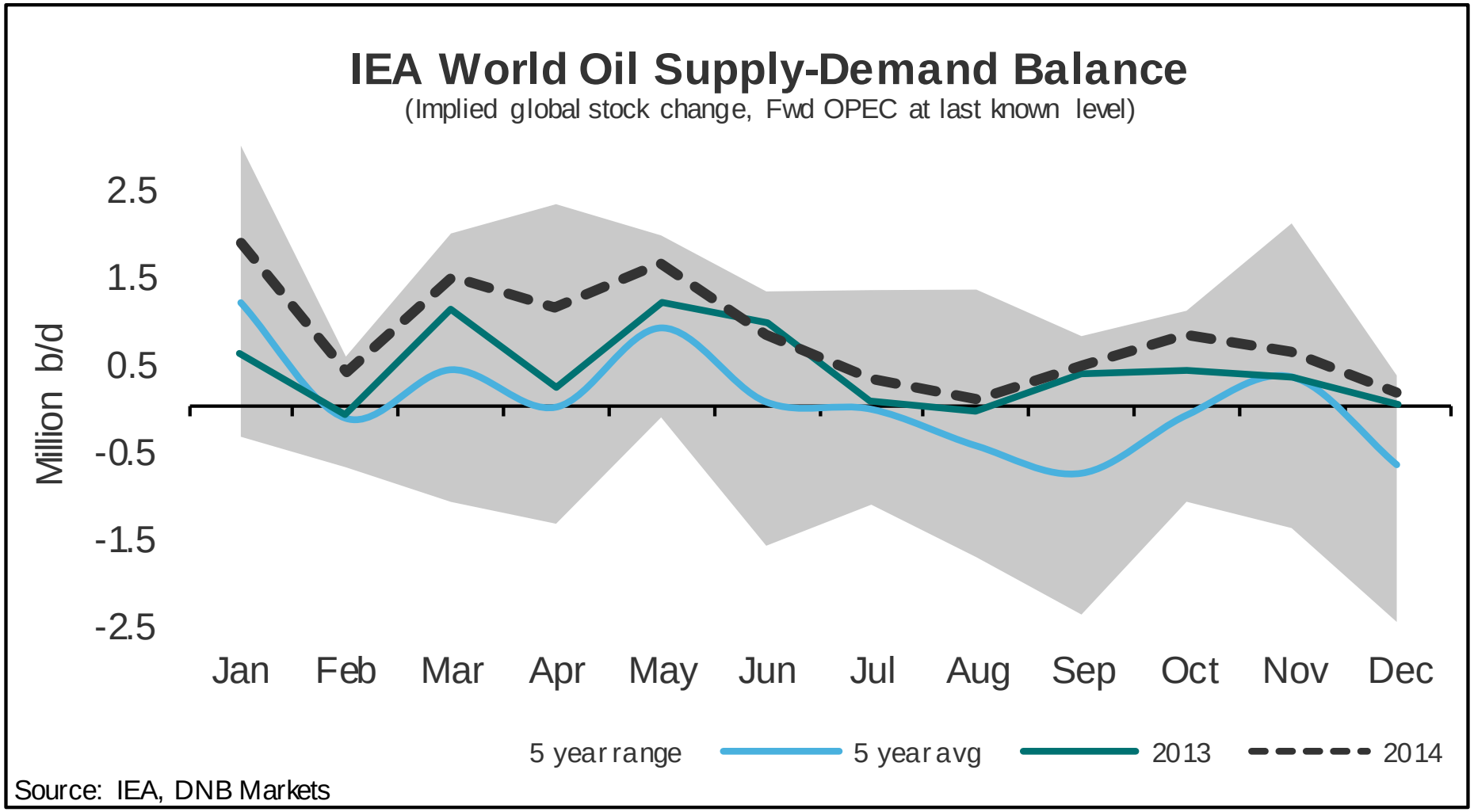
IEA's Weakening Supply-Demand Balance For 2014

- This is even assuming OPEC output at the last known levels (in other words Iran and Libya still shut out of the market)



Source: IEA, DNB Markets

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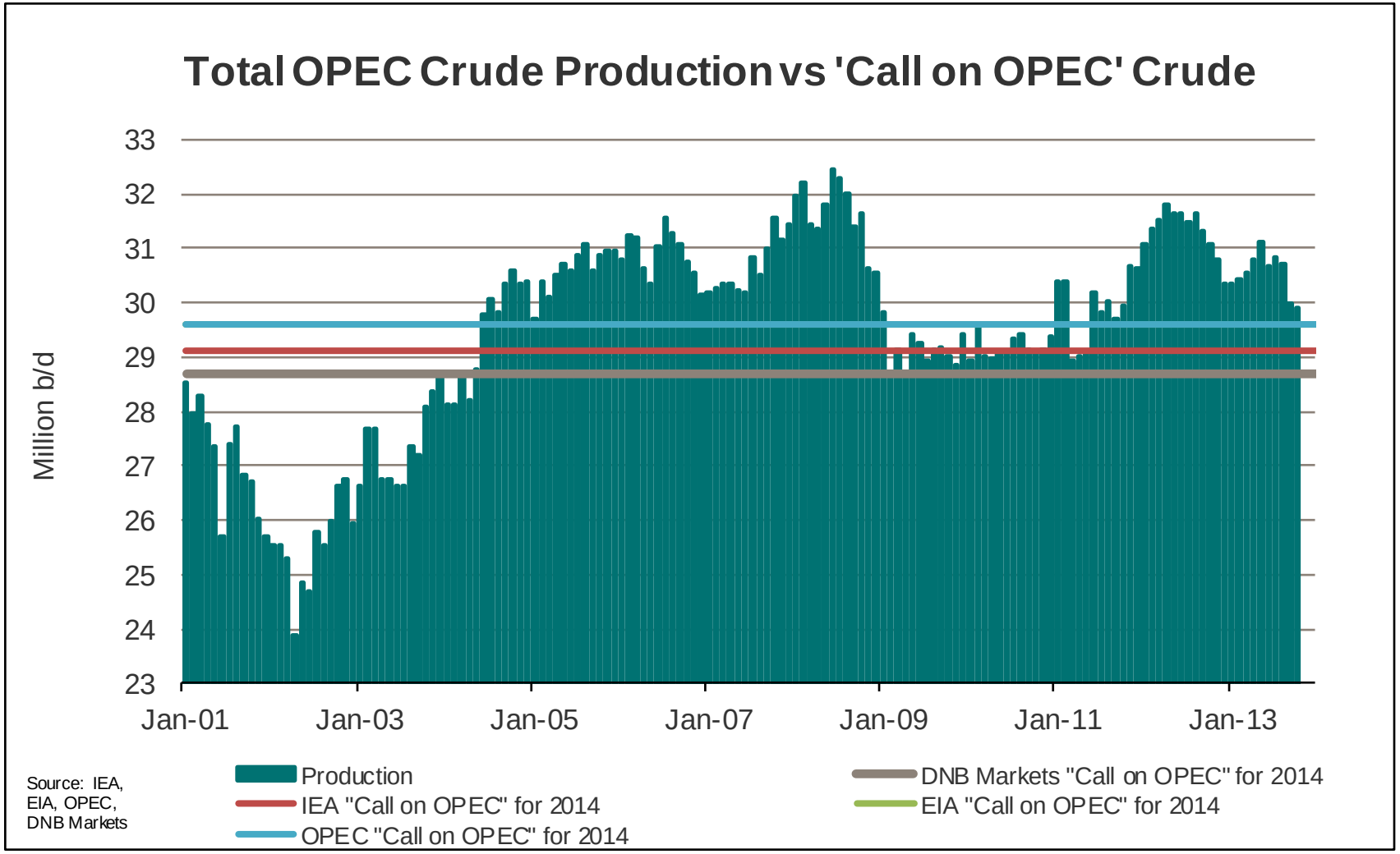
Lower ‘Call on OPEC’ for 2014 Than Current OPEC Output

- Weaker balance seen next year



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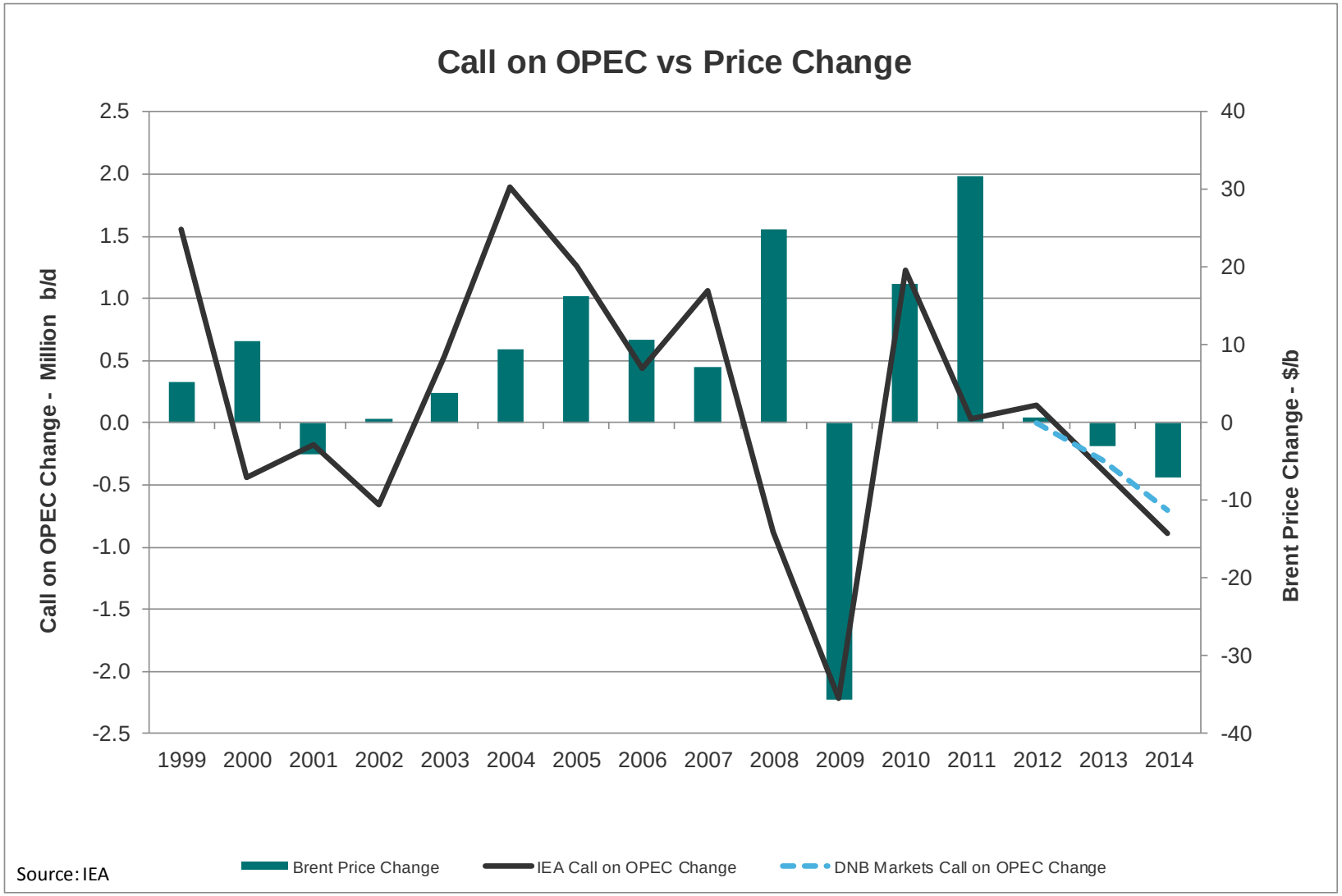
The Average Price Drops If Call On OPEC Drops

- The average oil price drops if the “Call on OPEC” drops significantly



Source: IEA

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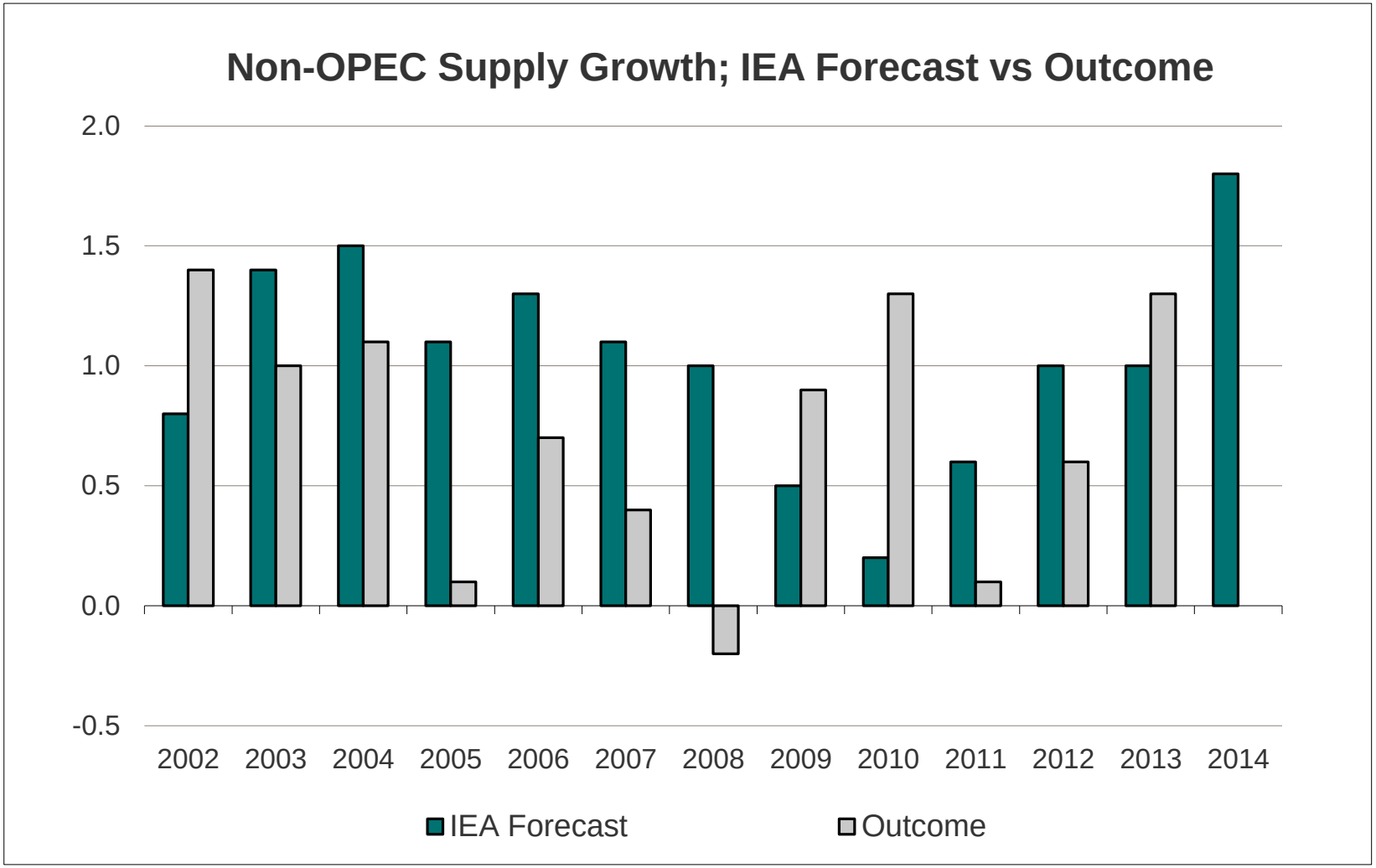
Fundamental Balances DNB Markets vs IEA, OPEC, EIA



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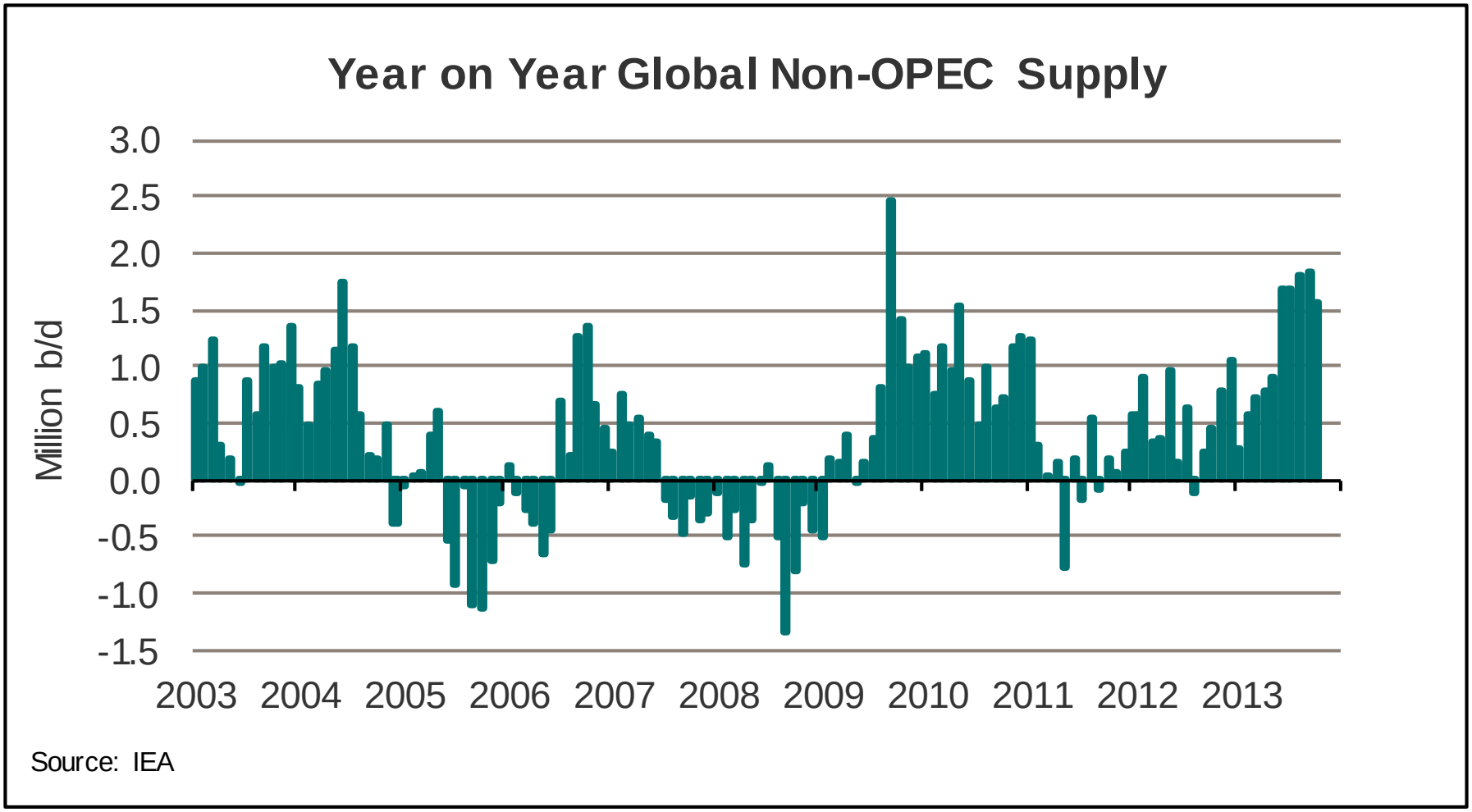
Very Strong Growth In Supply Outside Of OPEC

- Growth now solidly above 1 million b/d and OPEC NGLs and Biofuels are not included



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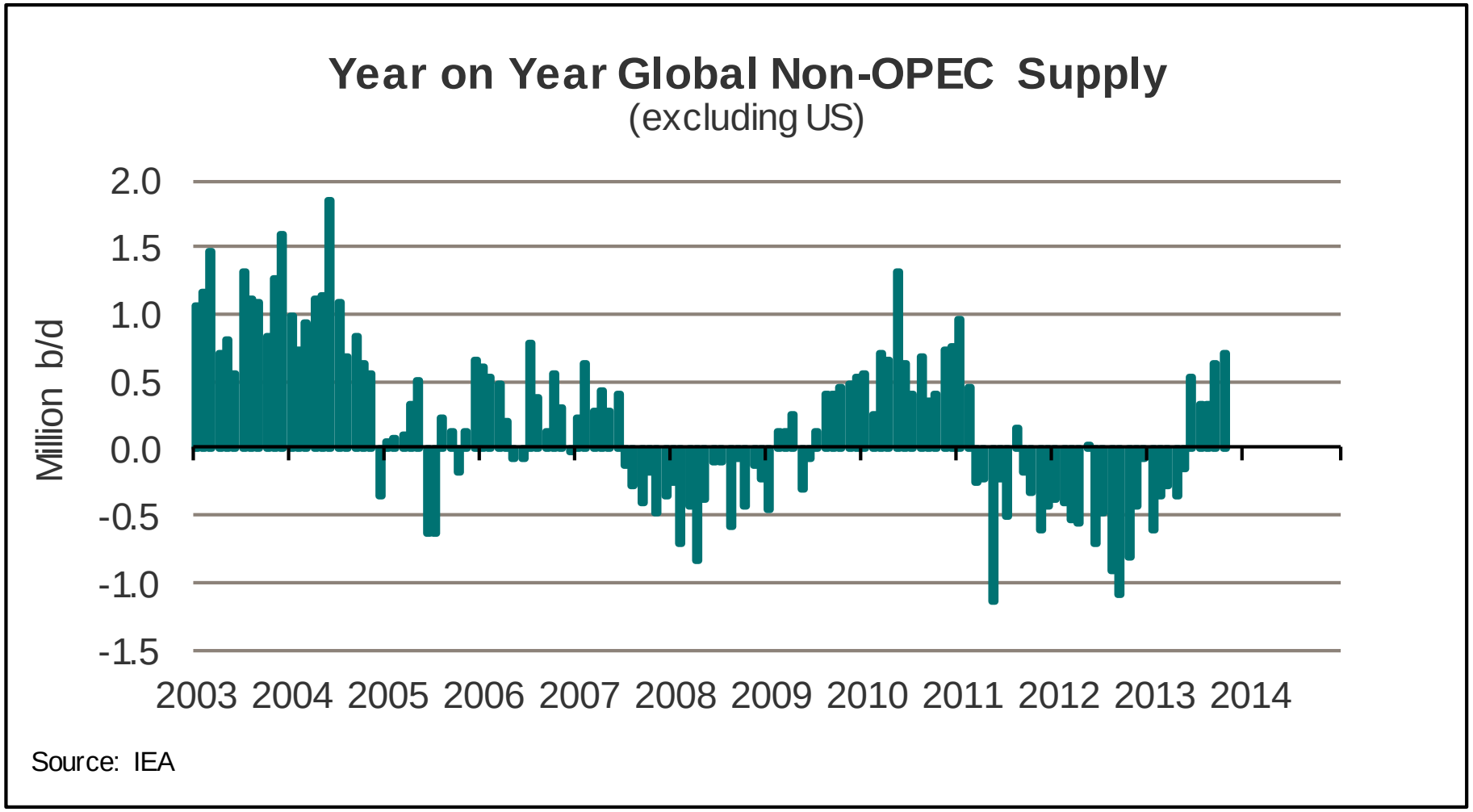
Growth In Supply Now Also Outside The USA



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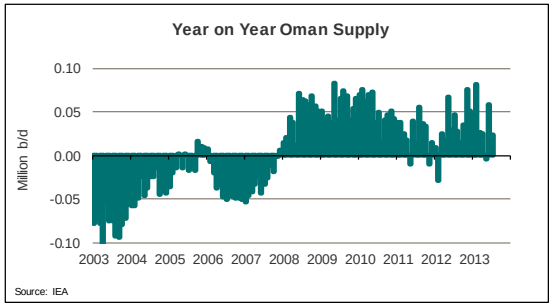
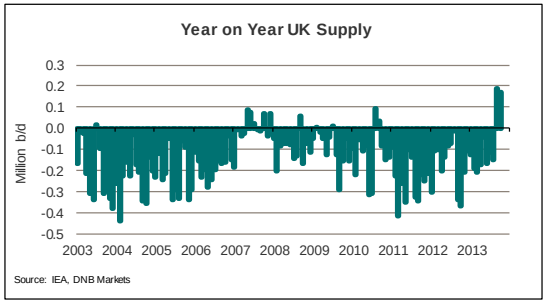
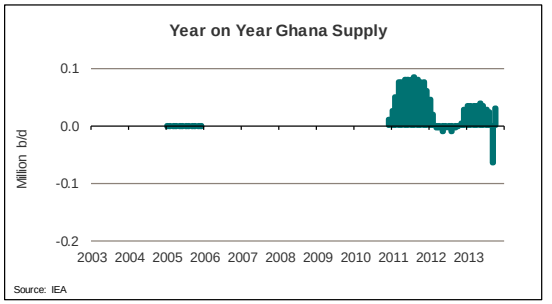
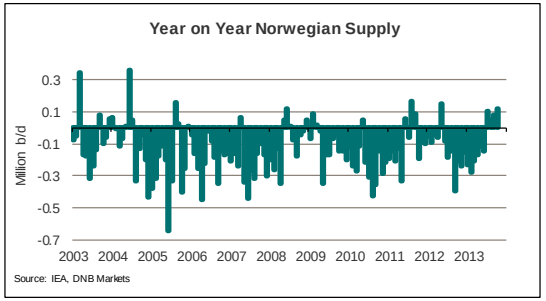
Not Only Growth In North America Now

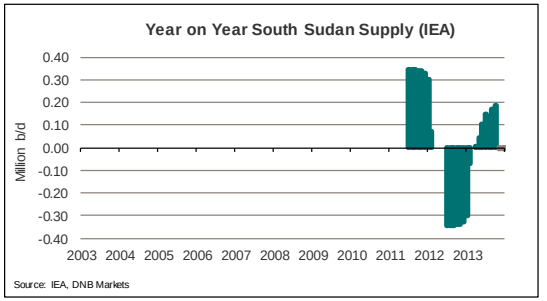
- We also see better numbers from Oman, Russia, Columbia, Brazil, Norway, UK, Kazakhstan, Azerbaijan, Ghana, South Sudan and “lo and behold” even Mexico is posting increased output as field decline started to be arrested after 2010…

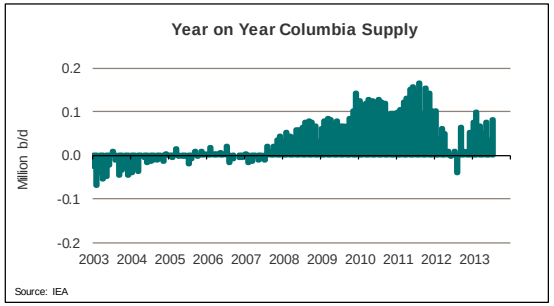


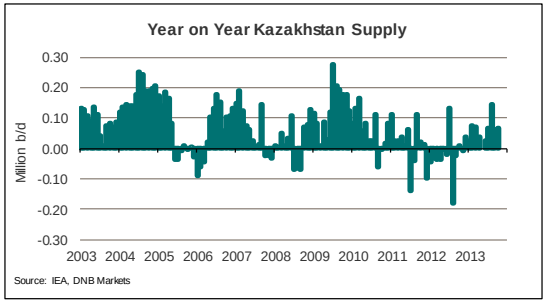


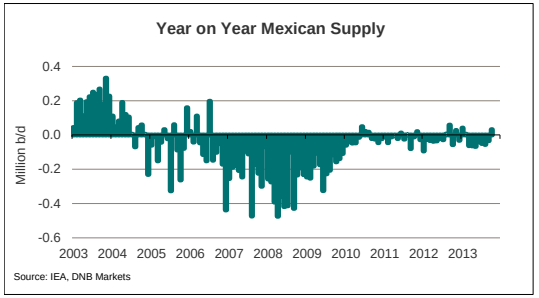


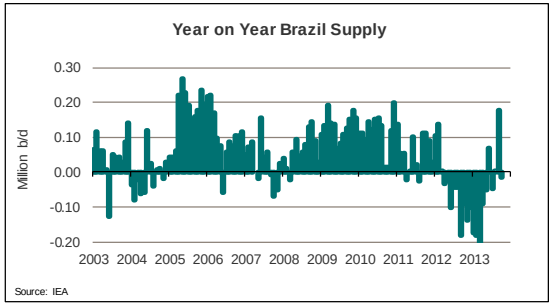


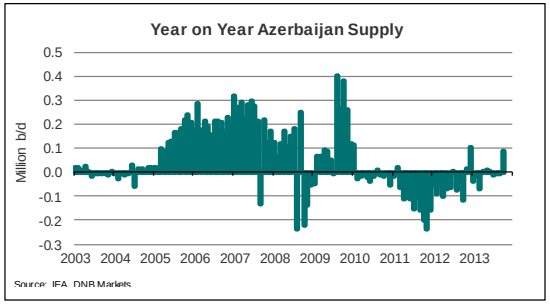












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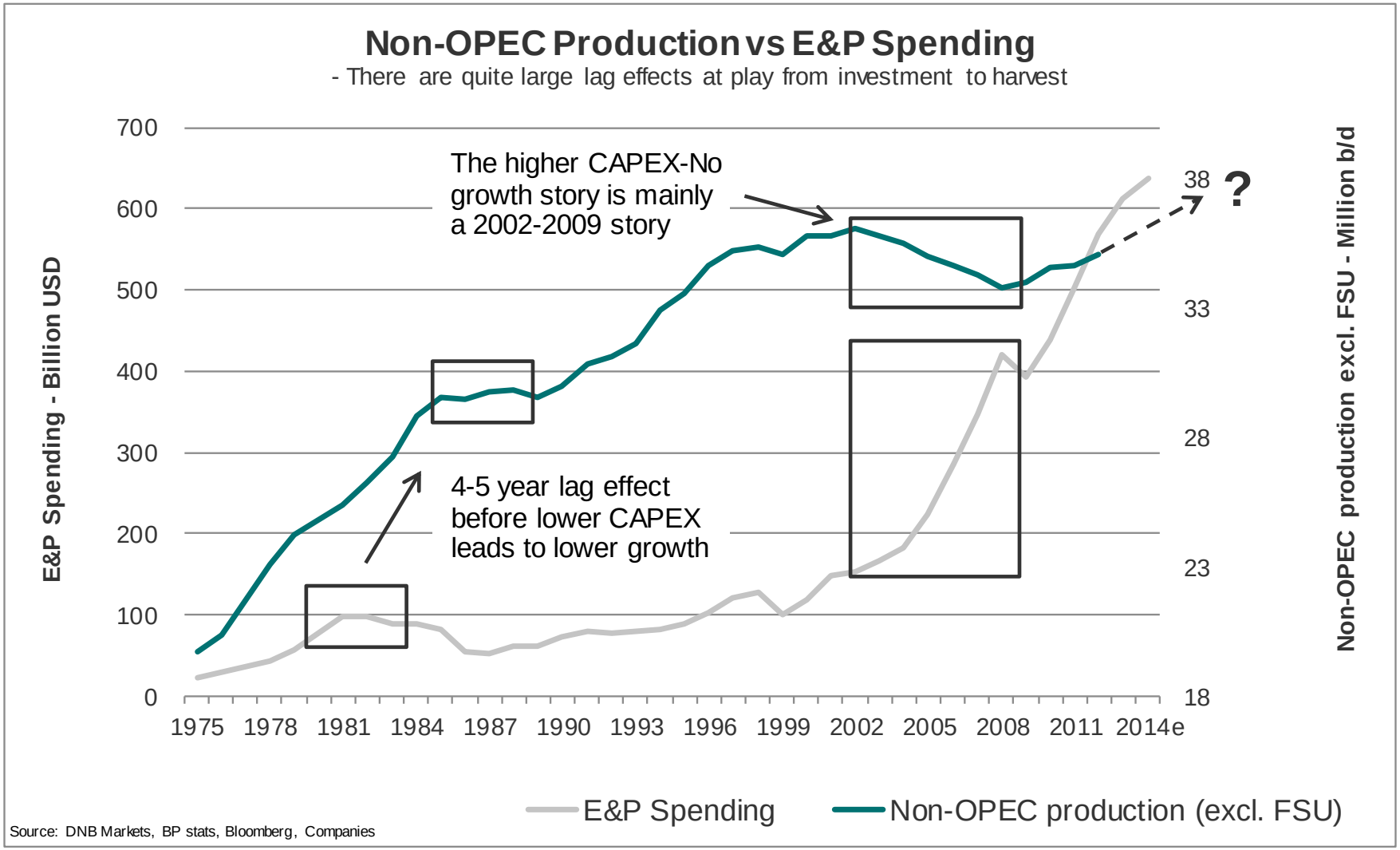
Flattish E&P CAPEX Does Not Equal No Production Growth

- The lag effects are quite large – Falling CAPEX in the early 1980's led to flattening growth 4-5 years later



Source: DNB Markets, BP stats, Bloomberg, Companies

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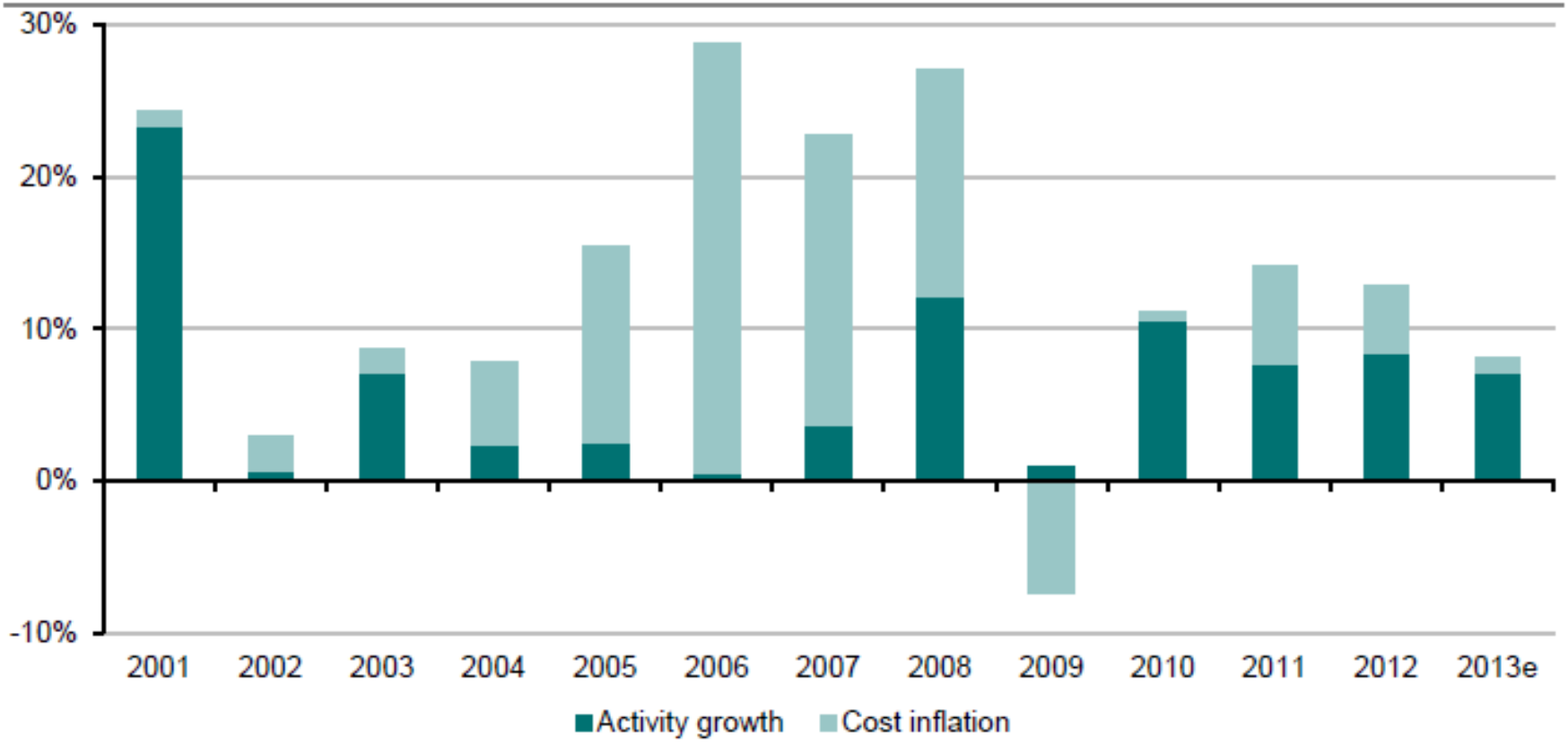
It Is Just Recently That Activity Levels Have Picked Up

- The huge growth in spending from 2002-2008 was caused by cost inflation which does not bring in new production growth

Fig. 36: Split between activity growth and inflation growth



Source: DNB Markets, companies

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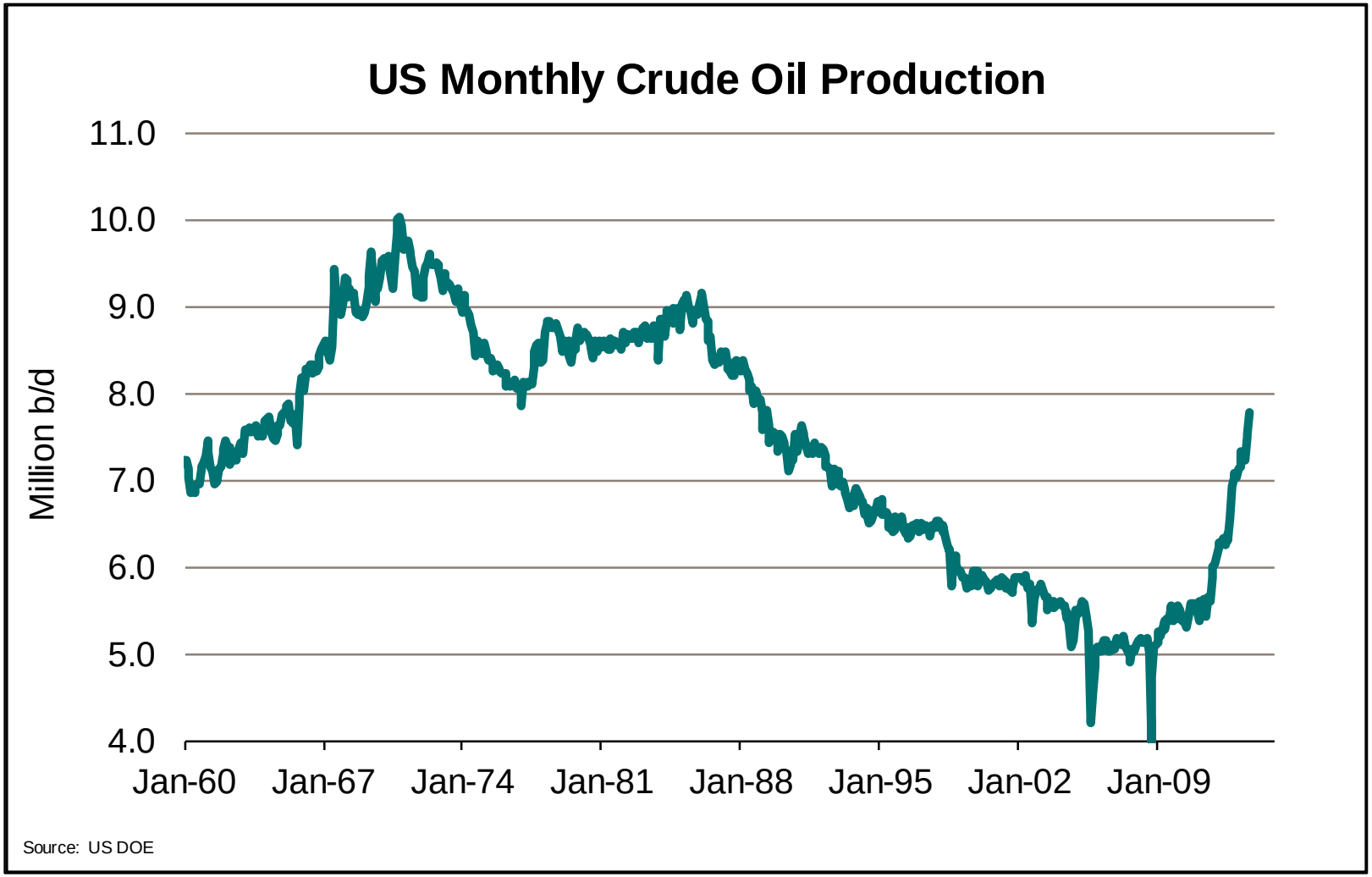
US Crude Production Back On The Rise – The Shale Revolution

- After more than 20 years of steep production decline, US production is rising again



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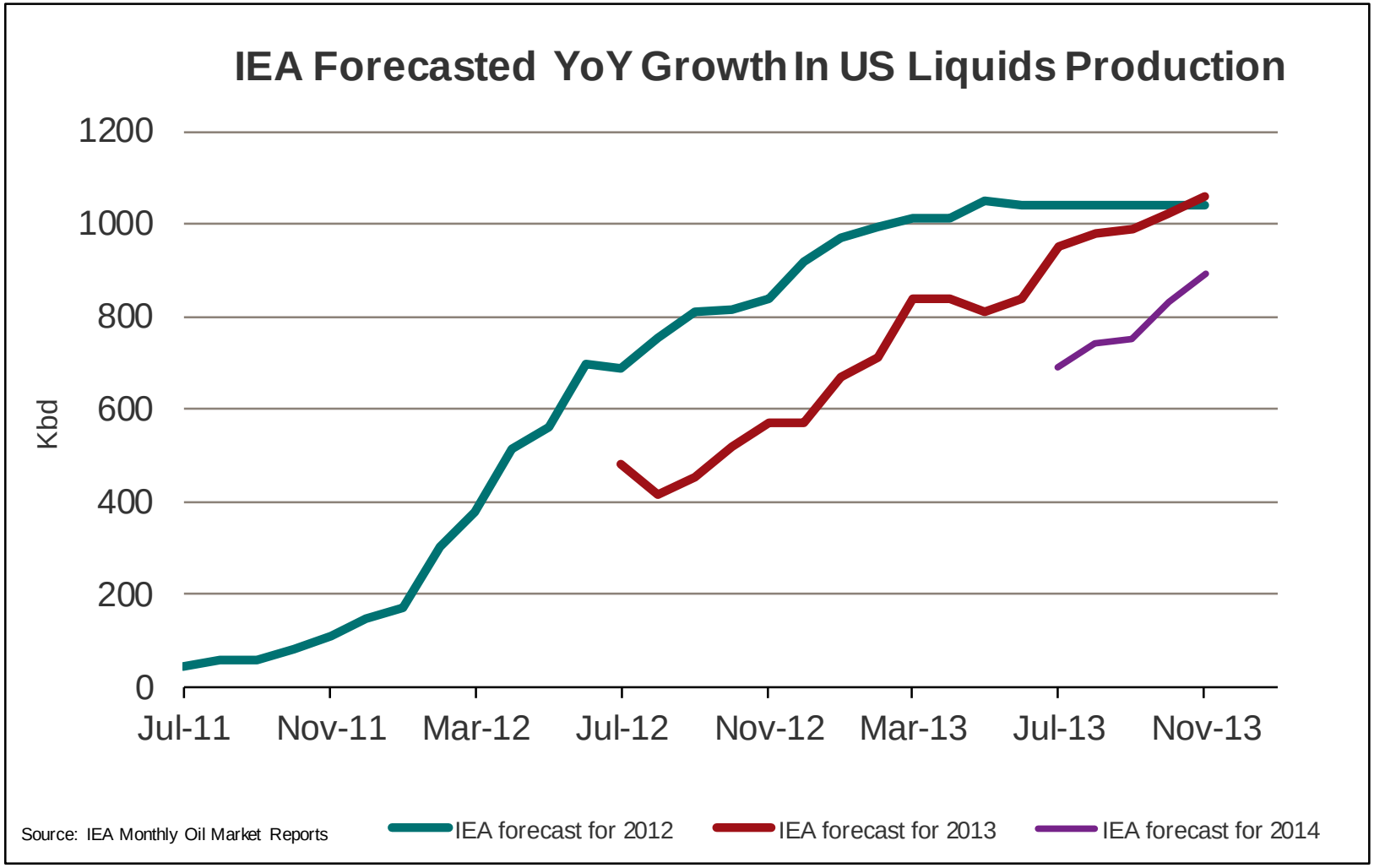
IEA's Forecasts For US Production Growth Were Far Too Low

- IEA's first take on 2012 US production growth was at 45 kbd - now 2012 growth is estimated to have been 1.04 million b/d



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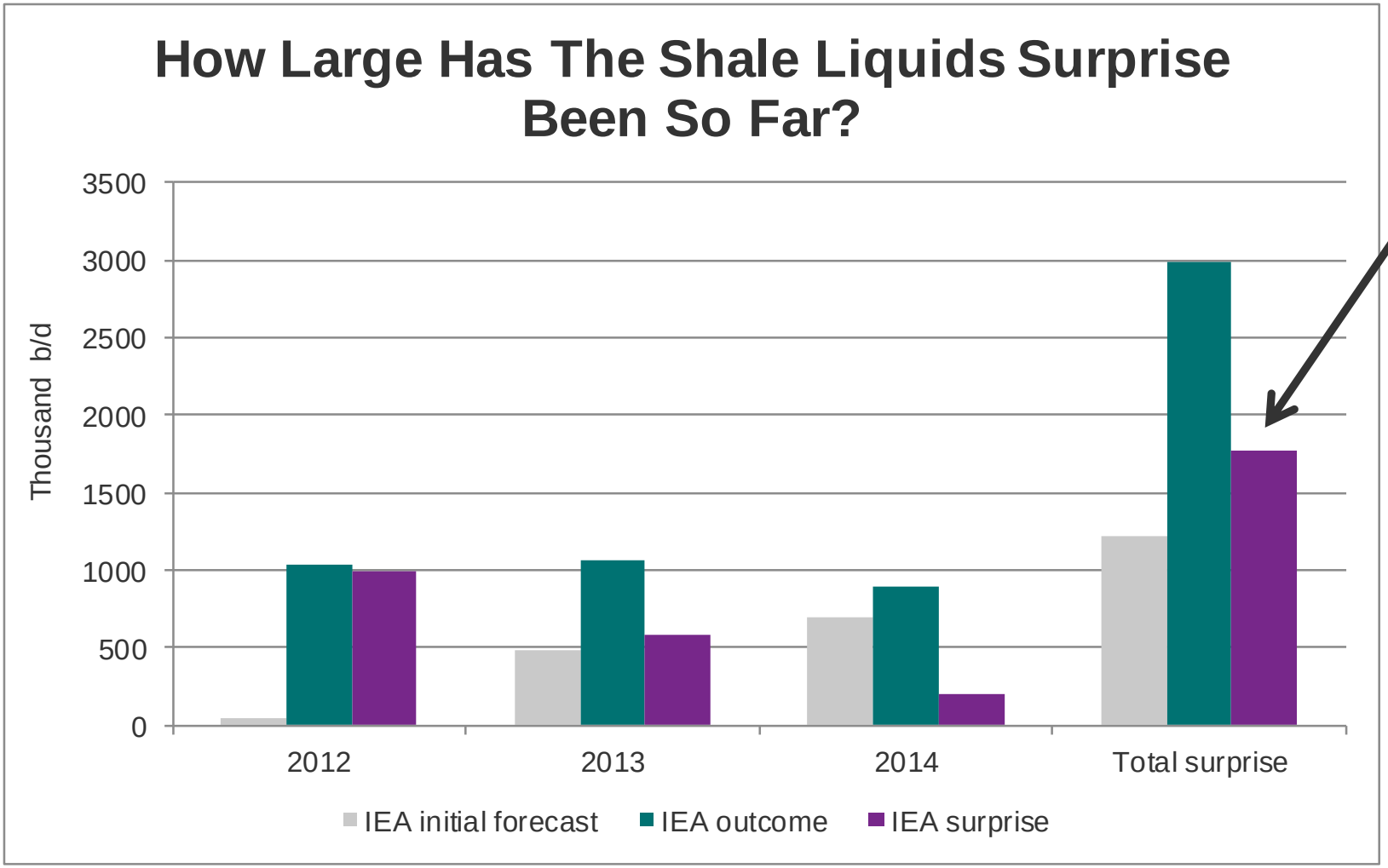
Upside Surprise Of 1.8 Million b/d So Far Last Two Years

- Since the summer of 2011 the IEA has “received 1.8 million b/d” into their balances that was not on the table in in 2011
- In other words; a new Norway has entered the market since 2011 and it came from “out of the blue”



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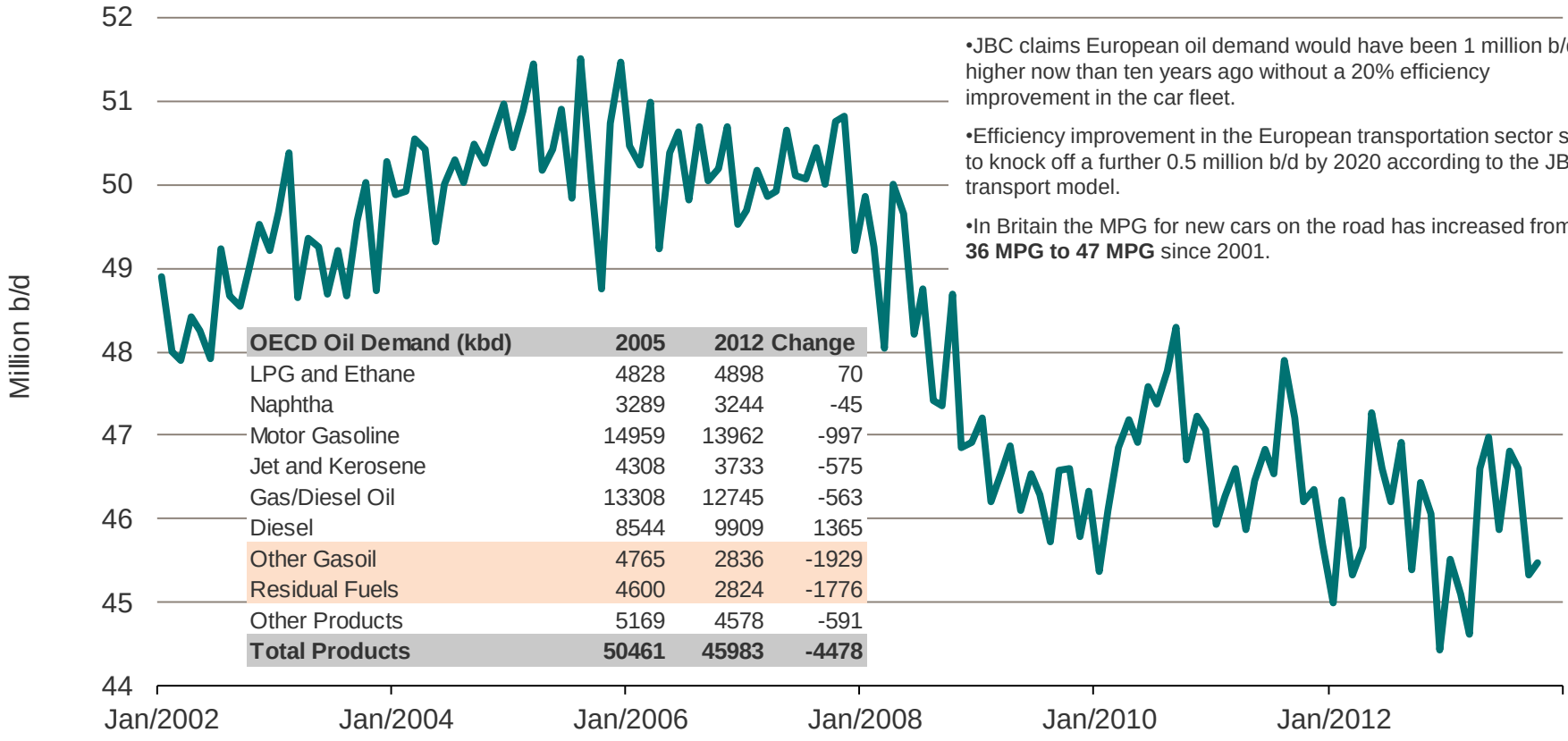
Peak Oil Has Already Happened

- At least when talking about demand in the developed world – and a large chunk of this looks structural and not cyclical



OECD Oil Demand (kbd)	2005	2012	Change
LPG and Ethane	4828	4898	70
Naphtha	3289	3244	-45
Motor Gasoline	14959	13962	-997
Jet and Kerosene	4308	3733	-575
Gas/Diesel Oil	13308	12745	-563
Diesel	8544	9909	1365
Other Gasoil	4765	2836	-1929
Residual Fuels	4600	2824	-1776
Other Products	5169	4578	-591
Total Products	**50461**	**45983**	**-4478**

- JBC claims European oil demand would have been 1 million b/d higher now than ten years ago without a 20% efficiency improvement in the car fleet.
- Efficiency improvement in the European transportation sector set to knock off a further 0.5 million b/d by 2020 according to the JBC transport model.
- In Britain the MPG for new cars on the road has increased from **36 MPG to 47 MPG** since 2001.

Source: IEA

24/01/2013

EU LAUNCHES CLEAN FUEL STRATEGY

The European Commission today announced an ambitious package of measures to ensure the build-up of alternative fuel stations across Europe with common standards for their design and use. Policy initiatives so far have mostly addressed the actual fuels and vehicles, without considering fuels distribution. Efforts to provide incentives have been un-co-ordinated and insufficient.

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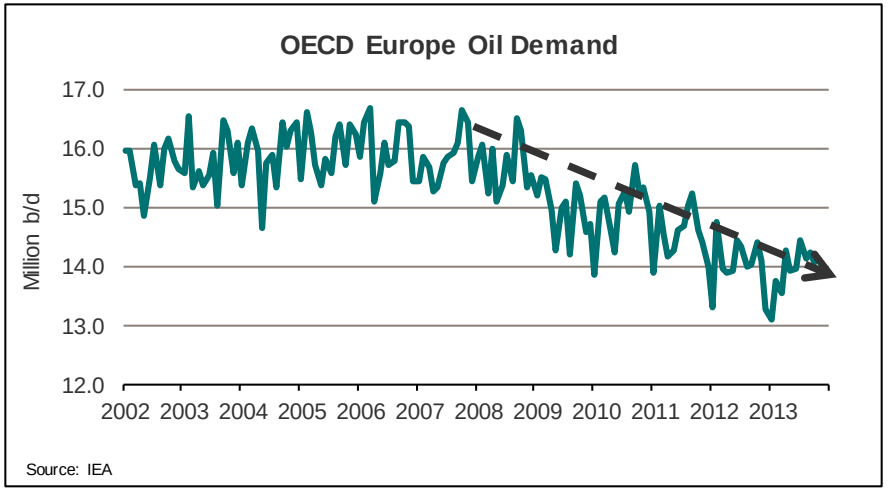
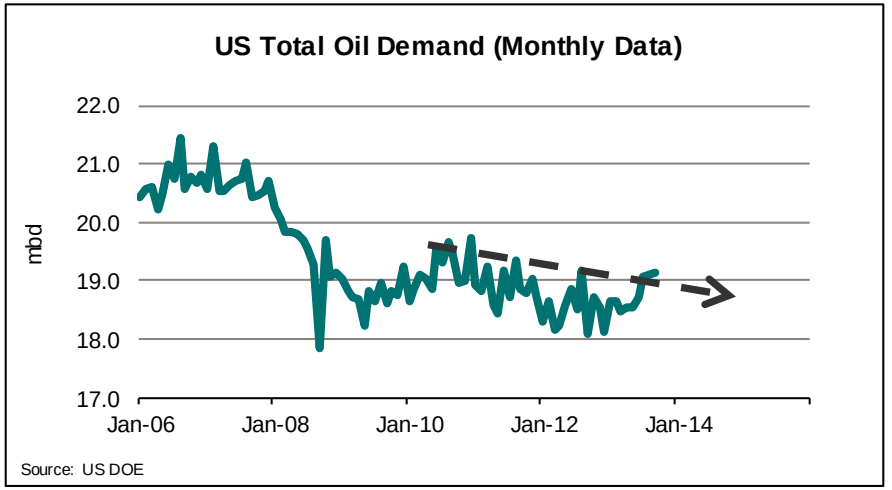
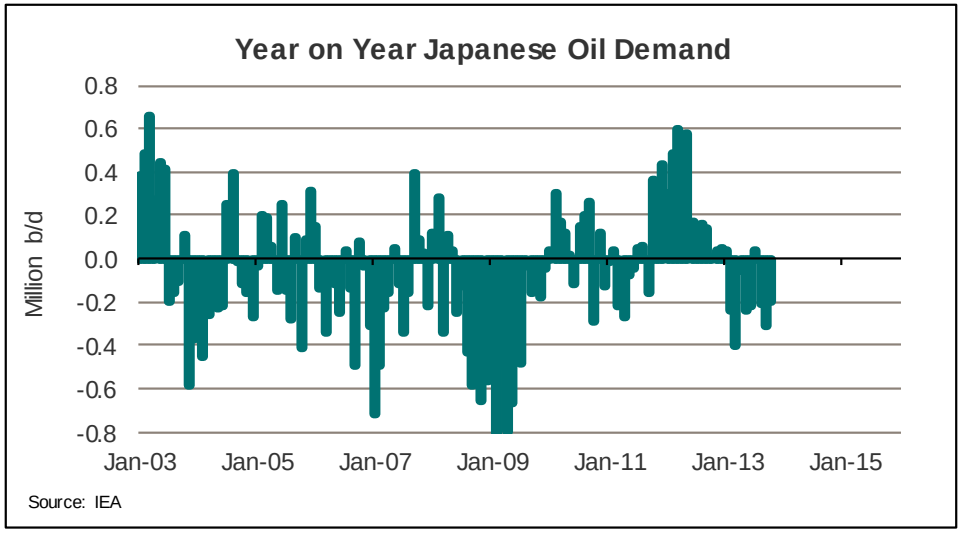
Oil Demand Trending Lower In Key OECD Countries







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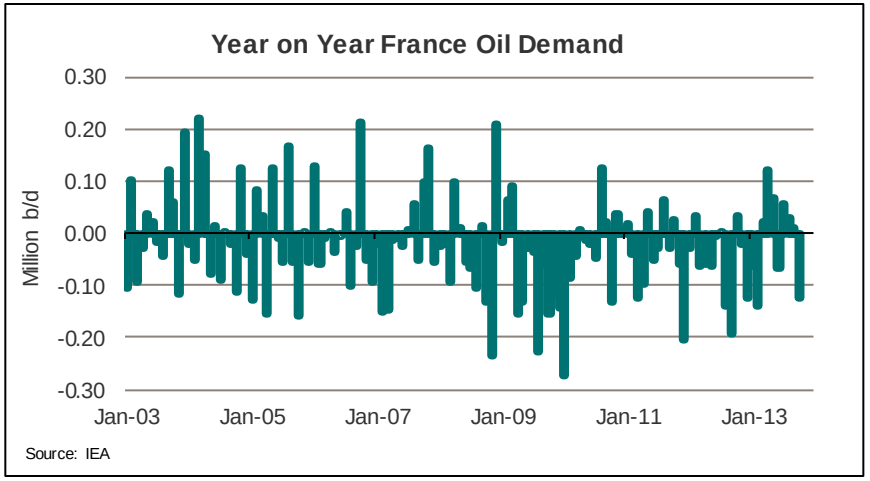
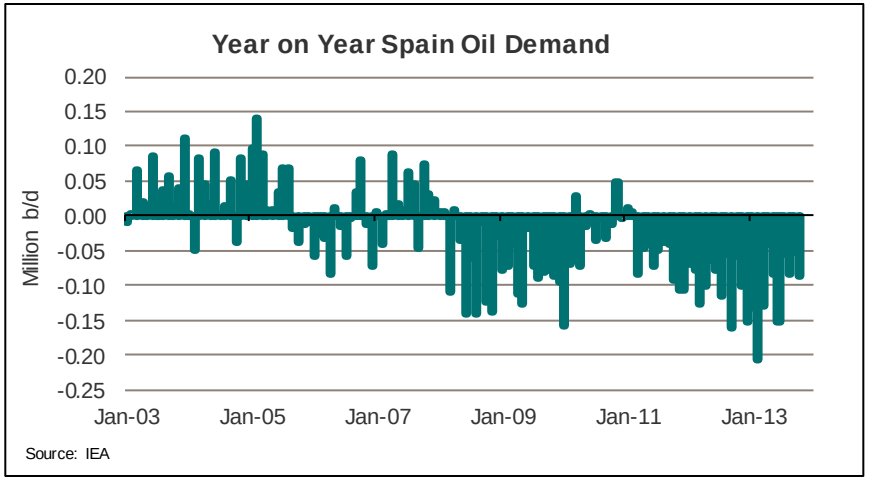
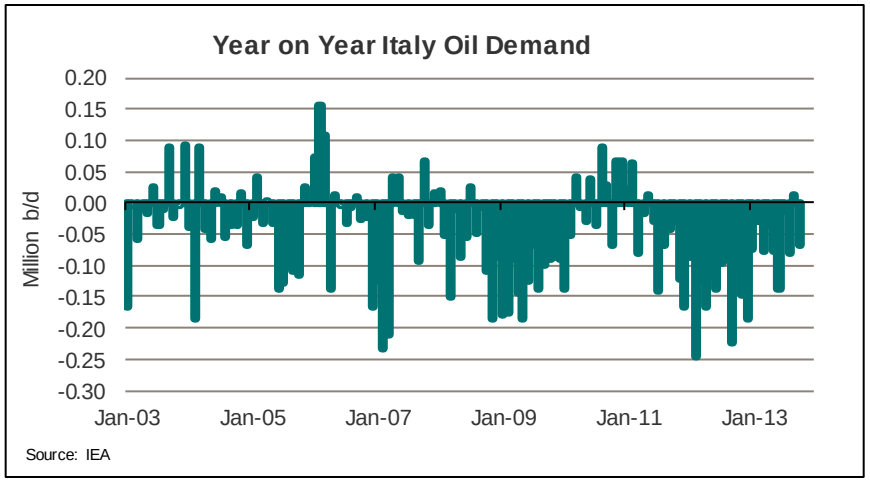
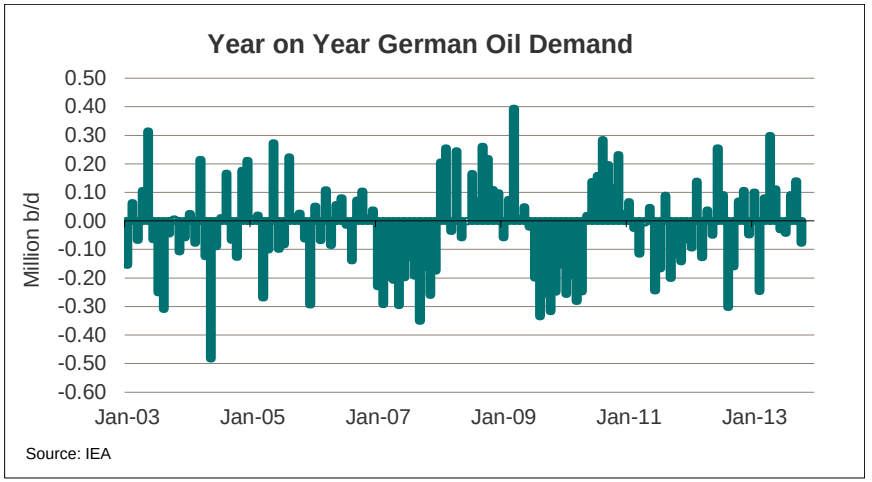
Still No Visible Oil Demand Growth In Key European Countries









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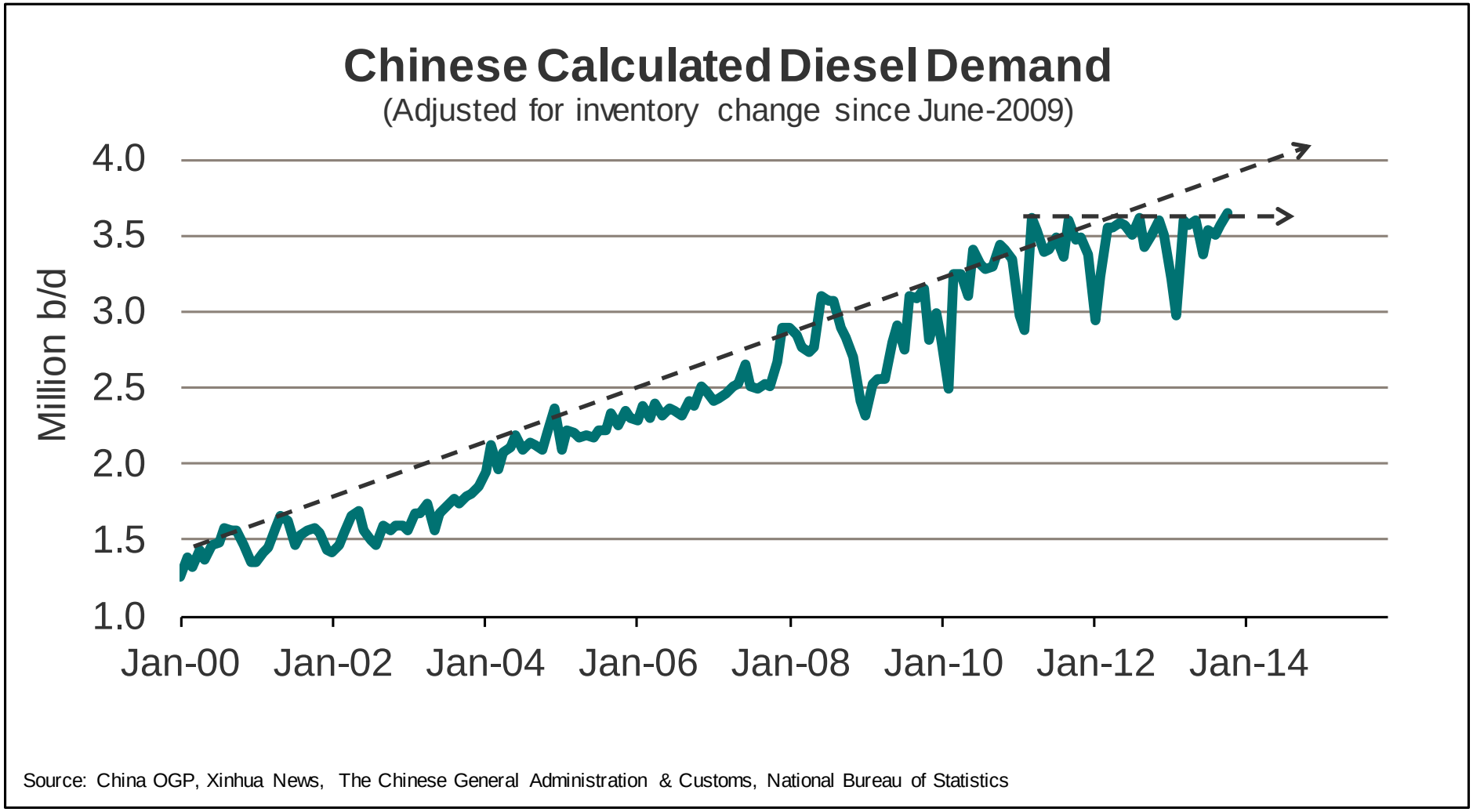
Chinese Oil Demand Growth To Favor Personal Consumption

- Diesel demand is not performing



Source: China OGP, Xinhua News, The Chinese General Administration & Customs, National Bureau of Statistics

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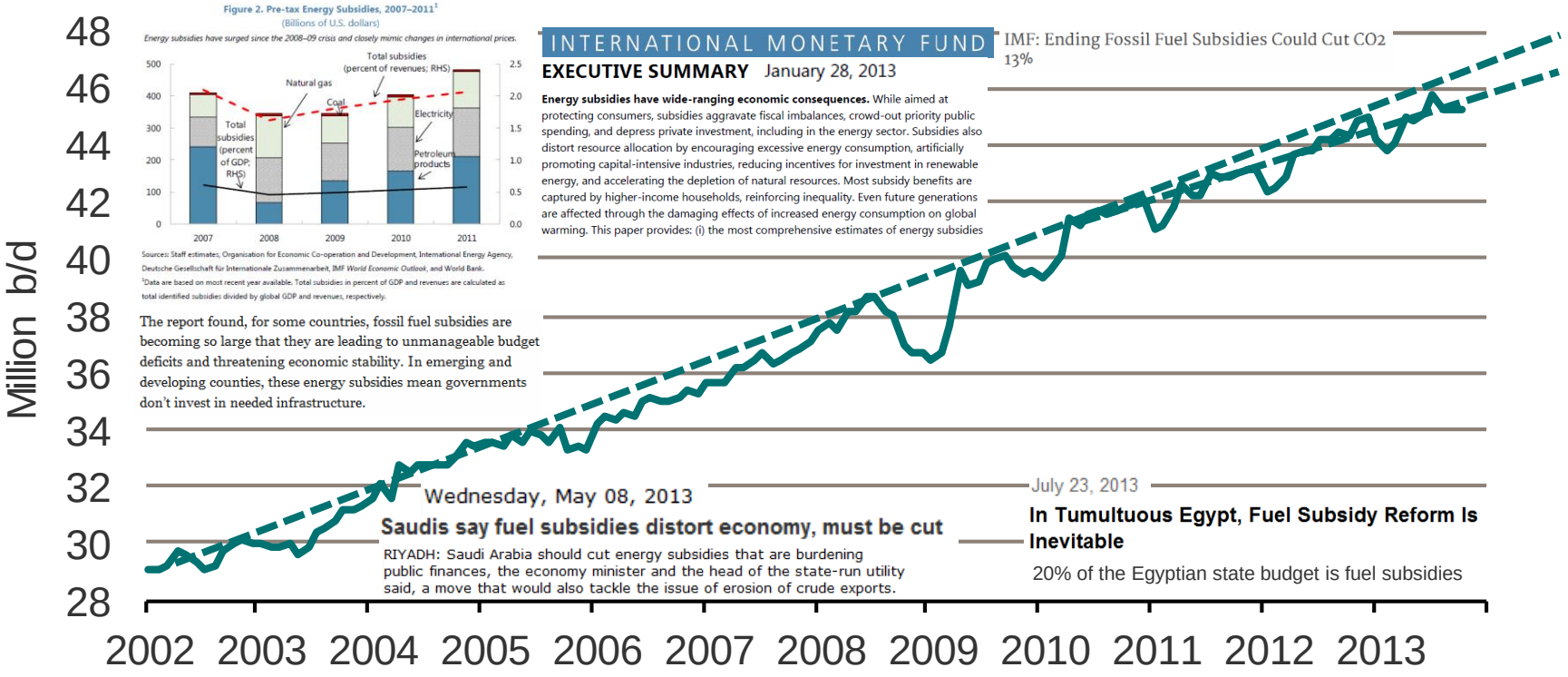
Non-OECD Oil Demand Will Continue To Grow

- We do however expect the growth rate to decrease in the current decade



Source: IEA

2012 Sep 13: India cut fuel subsidies, implementing gradually since Jan 2013
2013 April: China reform end user prices
2013 May 08: Saudi say fuel subsidies must be cut, distorts economy
2013 June 22: Indonesia cut fuel subsidies
2013 July 14: Vietnam fuel subsidy fund almost exhausted
2013 Sep 3: Malaysia cut fuel subsidies
2013 Brazil – Petrobras has increased diesel prices by 10% and gasoline by 7%

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Petroleum Subsidies Have Supported Oil Demand In Non-OECD

- Emerging Markets economies heavily subsidize oil prices for their consumers, but some large countries are now forced to cut back

Country	% of Government Revenues	Population Million	Oil demand kbd
FSU			
Armenia	2.1	3	
Azerbaijan	1.9	9	
Georgia	2.0	5	
Kazakhstan	2.3	17	
Kyrgyzstan	10.4	5	
Turkmenistan	31.8	5	
Emerging Asia			
Bangladesh	7.6	153	106
Bhutan	1.4	0.7	
Brunei	3.8	0.4	18
India	**6.8**	1270	3427
Indonesia	**14.5**	246	1636
Malaysia	**5.7**	29	746
Myanmar	9.4	60	27
Pakistan	1.0	179	453
Sri Lanka	8.0	21	106
Thailand	0.7	67	1310
Latin America			
Antigua	2.4	0.1	
Bolivia	6.6	10.3	72
Ecuador	15.4	14.7	263
St.Kitts	0.6	0.1	
St.Lucia	0.7	0.1	
Trinidad	7.5	1.3	
Venezuela	15.8	29.7	709

Country	% of Government Revenues	Population Million	Oil demand kbd
MENA			
Algeria	10.8	37.3	396
Bahrain	19.0	1.2	
Egypt	**30.6**	83.6	756
Iran	**17.0**	79	1721
Iraq	**12.7**	31.1	777
Jordan	8.1	6.2	139
Kuwait	**4.6**	2.6	459
Libya	16.6	1.8	269
Morocco	2.4	32.3	297
Oman	7.3	3.1	184
Qatar	3.2	1.9	229
Saudi Arabia	**14.0**	26.5	3026
Sudan	7.3	34.2	98
Tunisia	2.4	10.8	86
UAE	**1.4**	5.3	699
Yemen	19.0	24.8	138
Africa			
Angola	2.7	21	129
Cameroon	8.9	20	38
Congo	2.8	75.5	16
Equatorial G.	0.9	0.7	
Ethiopia	1.1	83	54
Ghana	3.2	25	79
Madagascar	1.0	22	
Nigeria	**4.8**	166	336

Source: IMF, IEA, Wikipedia

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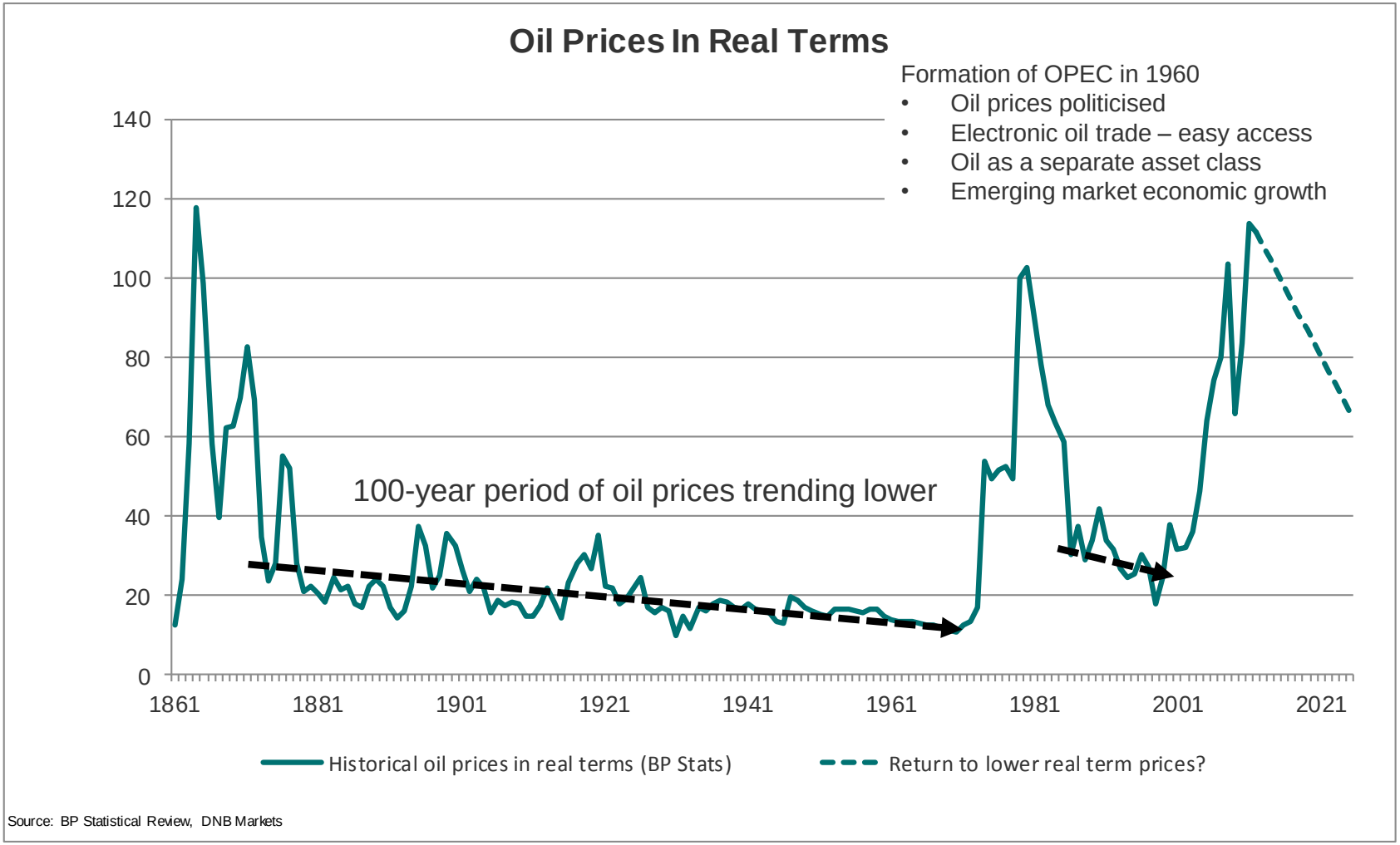
More Normal For Oil Prices To Trend Lower Than Higher



Source: BP Statistical Review, DNB Markets

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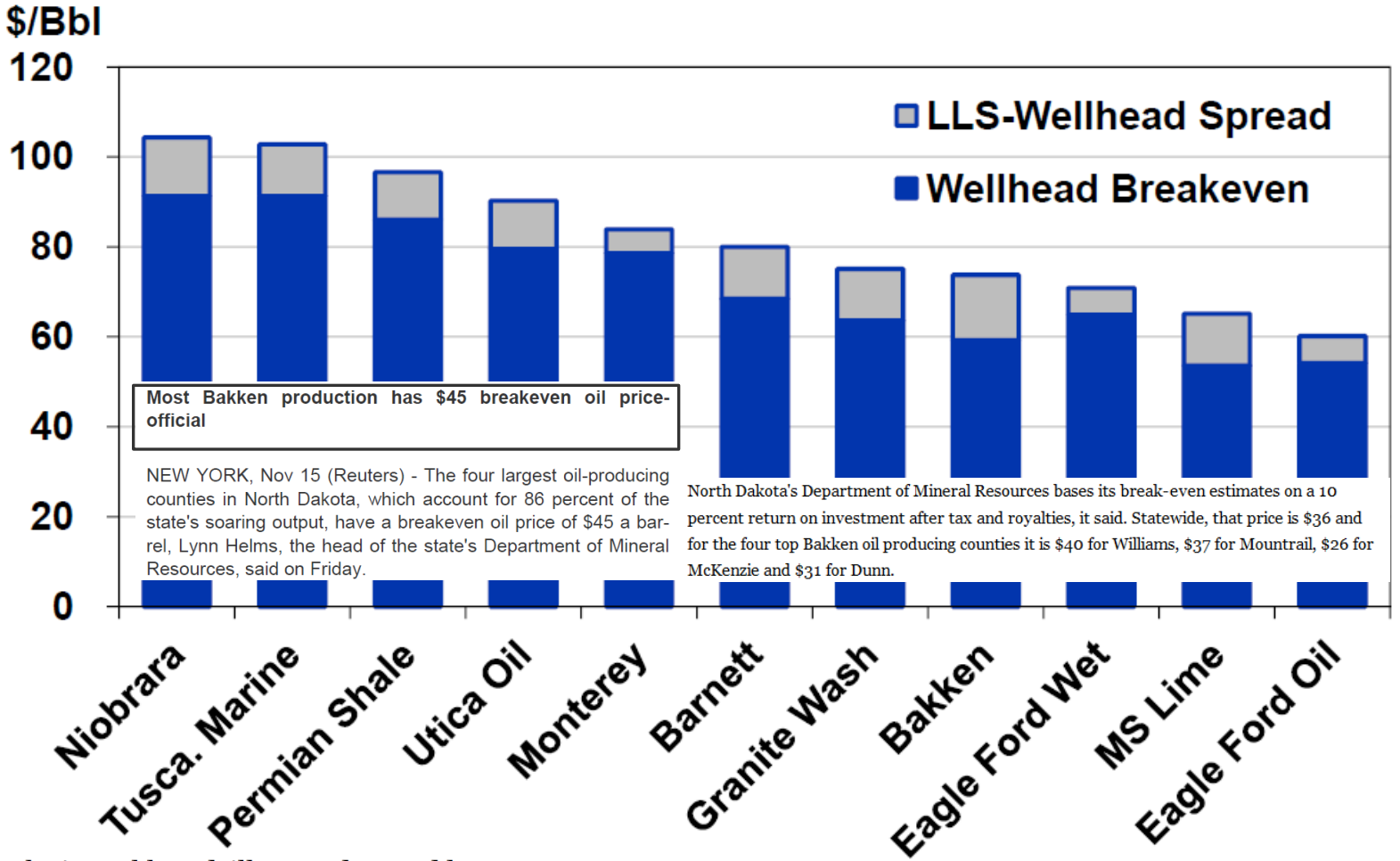
The New Shale Resources Are Not Particularly Cheap

- Oil prices needs to stay in the 75-90 $/b range or higher to make the broad shale industry economical according to PIRA Energy



Most Bakken production has $45 breakeven oil price-official

NEW YORK, Nov 15 (Reuters) - The four largest oil-producing counties in North Dakota, which account for 86 percent of the state's soaring output, have a breakeven oil price of $45 a barrel, Lynn Helms, the head of the state's Department of Mineral Resources, said on Friday.

North Dakota's Department of Mineral Resources bases its break-even estimates on a 10 percent return on investment after tax and royalties, it said. Statewide, that price is $36 and for the four top Bakken oil producing counties it is $40 for Williams, $37 for Mountrail, $26 for McKenzie and $31 for Dunn.

Analysis: Bakken drillers undaunted by local oil prices under $80

BY SABINA ZAWADZKI
NEW YORK | Thu Nov 21, 2013 12:09am EST

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(Reuters) - North Dakota crude oil prices tumbled this month to below the $80-a-barrel "sweet spot" that helps drillers attract capital from other shale areas, yet the Bakken boom shows no signs of slowing.

Wood Mackenzie has an overall Bakken break-even price of $62 a barrel at current well costs, Garrett said. But for high-quality parts of the formation such as the Parshall and Sanish fields, that number goes down to the $38-$40 range.

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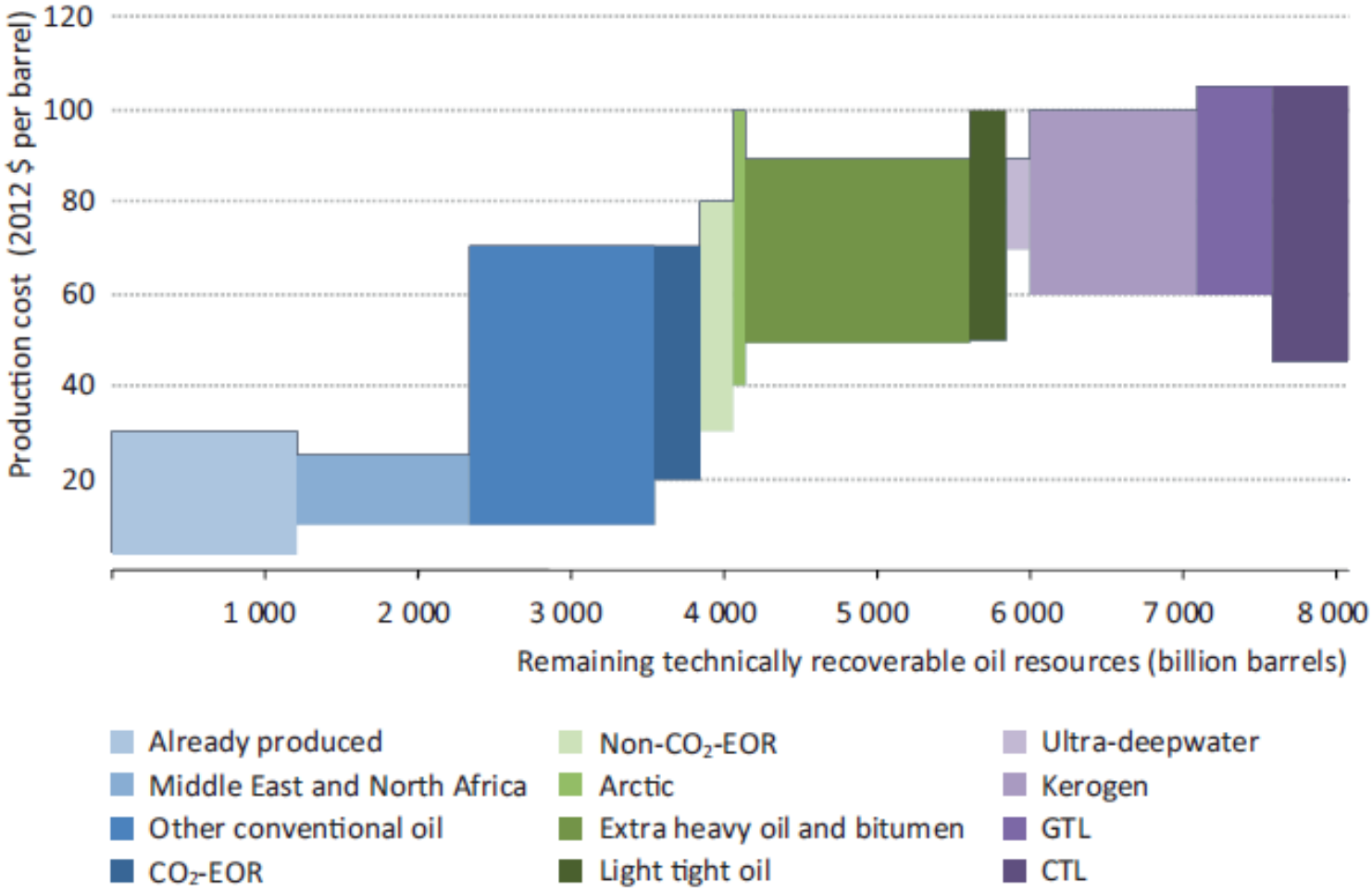
US Light Tight Oil Seen From 50-100 $/b Break Even

- What if most of the projects fall into the lower range and what if the total resource base is much higher than IEA estimate?



Source: *Resources to Reserves* (IEA, 2013).

Source: PIRA Energy

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The US Shale Liquids Industry's Largest 25 Players

- Note there are only 3 oil majors among these names
- The cost development for these 25 companies are the ones relevant to follow

Top US Shale Liquids Operators

Permian Horizontal/Eagle Ford/Bakken

Top Producers	Total kbd	Liquids kbd
EOG	283	225
Chesapeake	185	135
ConocoPhillips	183	129
Marathon	168	129
Continental	118	97
Hess	90	74
Whiting	85	73
Anadarko	136	63
Geosouthern	85	55
Murphy Oil	66	55
Statoil	59	50
Pioneer	93	47
ExxonMobil	55	46
Kodiak	46	36
Oasis	41	36
Concho	48	30
Devon	37	24
Cimarex	34	21
BHP Billiton	58	20
Apache	26	18
Bopco, LP	26	16
Mewbourne Holdings	18	12
Energen	16	11
SM Energy	70	11
Laredo Petroleum	15	8
Total production	**2,042**	**1,420**

Source: PIRA Energy

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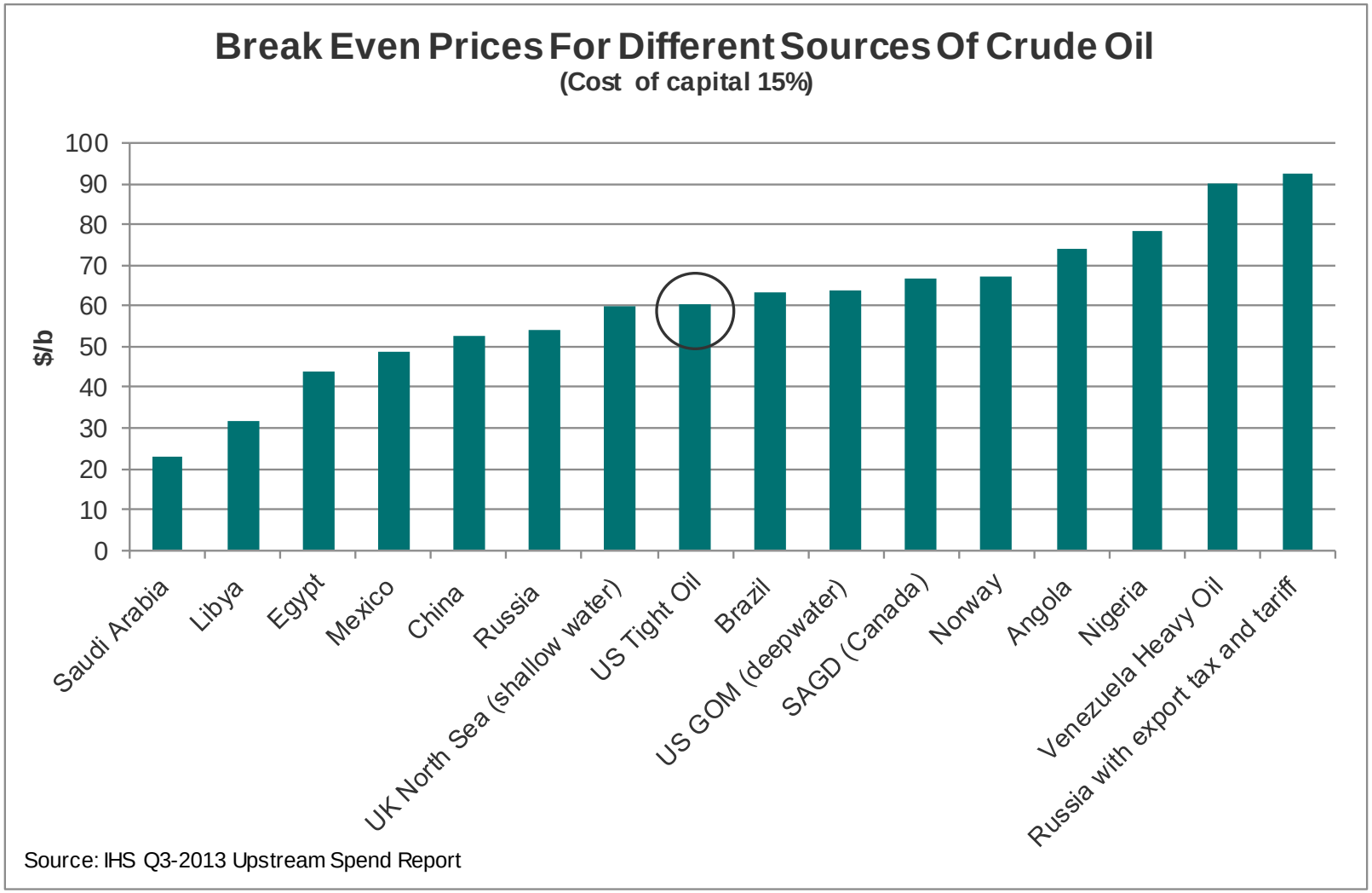
General World Break Even Prices By Source

- If the table below is correct then US tight oil is lower than earlier estimates we have seen



Source: IHS Q3-2013 Upstream Spend Report

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