

Lower for even longer

Commodities Research

Lower oil prices warranted by fundamentals

Oil prices have declined sharply over the past month to our \$45/bbl WTI Fall forecast. While this decline was precipitated by macro concerns, it was warranted in our view by weak fundamentals. In fact, the oil market is even more oversupplied than we had expected and we now forecast this surplus to persist in 2016 on further OPEC production growth, resilient non-OPEC supply and slowing demand growth, with risks skewed to even weaker demand given China's slowdown and its negative EM feedback loop.

Persistent surplus requires lower prices for even longer

Given our updated forecast for a more oversupplied oil market in 2016, we are lowering our oil price forecast once again. Our new 1-, 3-, 6- and 12-mo WTI oil price forecast are \$38/bbl, \$42/bbl, \$40/bbl and \$45/bbl. Our 2016 forecast is \$45/bbl vs. \$57/bbl previously and forwards at \$51/bbl. As we continue to view US shale as the likely near-term source of supply adjustment given the short cycle nature of shale production, we forecast that US Lower 48 crude & NGL production will decline by 585 kb/d in 2016 with other non-OPEC supply down 220 kb/d to end the oversupply by 4Q16.

Less US shale is one path to rebalancing the oil market

As the market now requires non-OPEC production to shift from growth to large declines in 2016, especially in the US, the uncertainty on how and where that adjustment will take place has increased significantly. In the US, capital allocation by Investment Grade E&Ps is now critical to rebalancing the market despite (1) less binding financial levers for IG than HY E&Ps and (2) deeply entrenched expectations that shale production growth will be required within the next couple years. This potential access to capital and the uncertainty it creates means that elevated financial stress needs to be maintained given the need for such large supply adjustments.

Operational stress is a growing downside risk to our forecast

This further creates the risk that a slowdown in production takes place too gradually forcing oil markets to clear as they historically have, through a collapse to production costs once the surplus breaches logistical and storage capacity. While not our base case, the potential for oil prices to fall to such levels, which we estimate near \$20/bbl, is becoming greater as storage continues to fill.

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Executive Summary

Oil prices have declined sharply over the past month, along with other asset classes. Importantly, we view this pull back to our Fall WTI forecast of \$45/bbl as warranted by weak oil fundamentals with concerns for a slowdown in EM/China activity creating additional downside risk to current prices. In fact, even before potential further deceleration in global growth, the oil market is more oversupplied than we had forecast in May.

We expect the drivers of this 2015 oversupply to persist through 2016 given: (1) further OPEC production growth as this remains the optimal strategy to raising long-term revenues in our view, (2) resilient non-OPEC ex. US production as broadly determined by investments already made, and (3) slowing demand growth on sequentially stable prices and lackluster global growth with risks clearly skewed to the downside given China's recent slowdown and the negative feedback loop of lower commodity prices on EM exporters facing large imbalances and debt. Finally, while the EIA recently reported a decline in US production, it is important to note that it also increased the stock build and "balancing term", leaving uncertainty around the reported decline. Our own modeling of US production – consistent with company guidance and high frequency pipeline data– points to an only moderate 2Q vs. 4Q15 production decline of 245 kb/d.

Given our updated forecast for a more oversupplied oil market in 2016, we are lowering our oil price forecast once again. As previously, we continue to view US shale as the likely near-term source of supply adjustment given both the short cycle nature of shale production and the importance of capital as the new margin of adjustment. Our new 1-, 3-, 6- and 12-mo WTI oil price forecast are \$38/bbl, \$42/bbl, \$40/bbl and \$45/bbl from \$45/bbl, \$49/bbl, \$54/bbl and \$60/bbl previously. Our 2016 average price forecast is now \$45/bbl vs. \$57/bbl previously and the forward curve at \$51/bbl. On our updated forecast, we expect the sharp deterioration in producer financial conditions that has occurred recently to persist on the recognition that the rebalancing of supply and demand is proving to be far more difficult than previously expected and that such stress is needed until evidence that US shale production growth is required. As a result, we now forecast that US Lower 48 crude and NGL production will decline by 585 kb/d in 2016 with other non-OPEC production down 220 kb/d to end the global oil market oversupply by 4Q16.

It is important to emphasize that as we now believe the market requires non-OPEC production to shift from our prior expectation of modest growth to large declines in 2016, the uncertainty on how and where that adjustment will take place has increased. While until now market focus was on the need to see High Yield US E&Ps potentially be forced close to bankruptcy, the required magnitude of the US production decline in 2016 now needs to include reductions by Investment Grade E&Ps, whose production is three times larger than HY E&Ps. This is an important shift, as ultimately the levers to force HY producers into lower production such as borrowing basis redeterminations, debt maturities and hedge coverage, are significantly less binding for IG E&Ps. This near-term adjustment mechanism is further put at risk by the deeply entrenched expectation – ours included – that the global oil market will require shale production growth within the next couple years.

This creates the risk that a slowdown in US production takes place too late or not at all, forcing oil markets to balance elsewhere or as they have historically cleared, through a collapse to production costs once the surplus breaches logistical and storage capacity. Net, while we are increasingly convinced that the market needs to see lower oil prices for longer to achieve a production cut, the source of this production decline and its forcing mechanism is growing more uncertain, raising the possibility that we may ultimately clear at a sharply lower price with cash costs around \$20/bbl Brent prices, on our estimates. While such a drop would prove transient and help to immediately rebalance the supply and demand for barrels, it would likely do little for the longer-term capital imbalance in the market with only lower prices for longer rebalancing the capital markets for energy.

Lower for even longer

Oil sell-off precipitated by macro concerns, but warranted by oil fundamentals

Oil prices have declined sharply over the past month, along with other asset classes, to retrace their lows of last winter. Importantly, we view this pull back in prices to our Fall WTI forecast of \$45/bbl as warranted by weak oil fundamentals with concerns over a slowdown in EM/China activity creating additional downside risk to current oil prices. In fact, even before a potential further deceleration in global growth, the global oil market is more oversupplied than we had forecast in May, still driven by excess supply (Exhibit 1) due to:

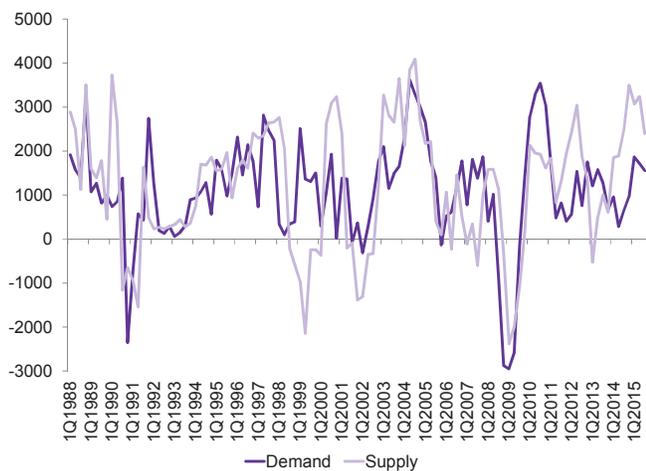
- OPEC production has continued to rise sharply, up 1.0 mb/d yoy, with Iraq and Saudi production setting new record highs. Non-OPEC production outside the US Lower 48 has also surprised to the upside, with production reaching 47.3 mb/d in 2Q15 vs. our 46.9 forecast. In particular, Russia and North Sea production are currently up 235 kb/d yoy in 1H16.
- Higher production outside of the US has more than offset a decline in the US Lower 48, with the updated EIA measure showing production down 316 kb/d since its April peak. Given that the EIA also increased the June stock build and its “balancing term”, uncertainty around the reported decline remains high. Further, this decline is likely to have been exacerbated by a sharp rise in in the backlog of drilled, but uncompleted wells¹. Our own modeling of US production – consistent with company guidance and high frequency pipeline data– pointing to an only moderate 2Q to 4Q15 production decline of 245 kb/d².
- While oil demand growth has been strong relative to recent years, this looks increasingly price induced (with a cold winter helping too) as global economic growth has in fact weakened since our last forecast revision in May. We currently estimate that yoy oil demand growth is 1.75 mb/d YTD, with our 2015 forecast now of 1.62 mb/d vs. 1.40 mb/d previously. Our modeling suggests that prices alone have contributed to 530 kb/d of oil demand growth this year.
- Net, demand growth remains well shy of the year-to-date supply growth of 2.9 mb/d with only 2004 briefly posting such demand growth as China and EM kicked off the previous decade’s commodity boom. Not only is emerging market growth slowing, but the benefits from lower prices are most likely behind us, as our demand impulse modeling shows that they typically last 9-12 months (Exhibit 3).

We estimate that the third quarter global market imbalance will be c.1.9 mb/d vs. c.2.2 mb/d in 1H15, with weekly stock data in the US, Europe, Singapore and Japan pointing to counter-seasonally large stock builds in July-August (Exhibit 2).

¹ See *Still too much light crude at the end of the tunnel*, April 6 2015

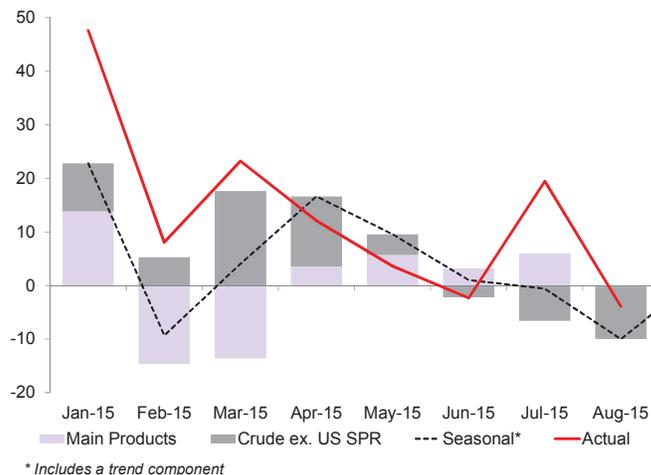
² See *EIA June crude oil production down more than expected*, August 31, 2015.

Exhibit 1: The global oil market is oversupplied as production remains 3.0 mb/d higher than last year
Year over year growth, million barrels per day



Source: IEA, EIA, JODI, Goldman Sachs Global Investment Research.

Exhibit 2: High frequency stocks point to a counter-seasonally large build in July-August
Weekly stocks (US, Japan, Singapore, ARA). Crude only for US & Singapore. Month-on-month change (kb/d) vs. seasonal

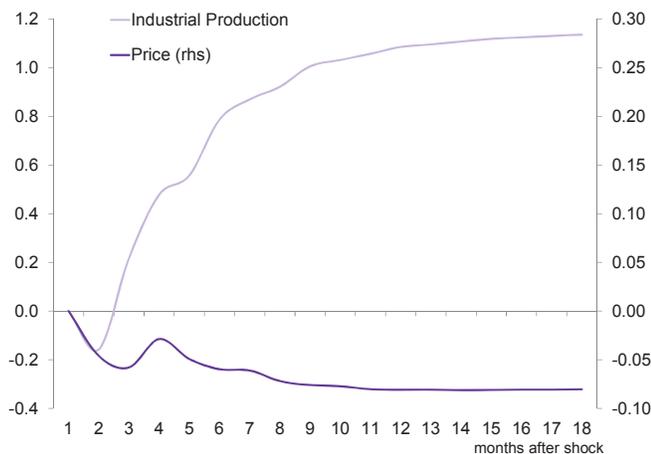


Source: EIA, US, IE Singapore, PAJ and PJK.

Going forward we expect this oversupply to persist until late 2016. Specifically:

- We expect demand growth to sequentially weaken to 1.275 mb/d in 2016 vs. our 1.5 mb/d previous forecast. Driving this forecast is our assumption that 2016 global growth will remain at 2015's 3.25% pace vs. our prior 3.75% assumption and our updated forecast for roughly sequentially stable oil prices in 2016. Importantly we view the risks to this demand growth forecast as clearly skewed to the downside, given China's recent slowdown, its potential impact on EM growth and the negative feedback loop of lower commodity prices on EM exporters facing large macro imbalances and debt. We illustrate our demand sensitivity to various growth and price outcomes in Exhibit 4.

Exhibit 3: Our VAR analysis shows that demand responses occur within 9 to 12 months...
Estimated oil demand response (in %) to +1% shock to prices or industrial production



Source: IEA, Goldman Sachs Global Investment Research.

Exhibit 4: ... with potentially weaker global growth a key downside risk to 2016 demand
2016 vs. 2015 global oil demand growth sensitivity (kb/d). 2015 Brent prices assumed at \$54/bbl

		2016 Global GDP Growth				
		2.75%	3.00%	3.25%	3.50%	3.75%
2016 Brent Price	35	1,250	1,460	1,670	1,880	2,090
	40	1,110	1,320	1,540	1,750	1,960
	45	980	1,190	1,400	1,610	1,830
	50	850	1,060	1,270	1,480	1,690
	55	720	930	1,140	1,350	1,560

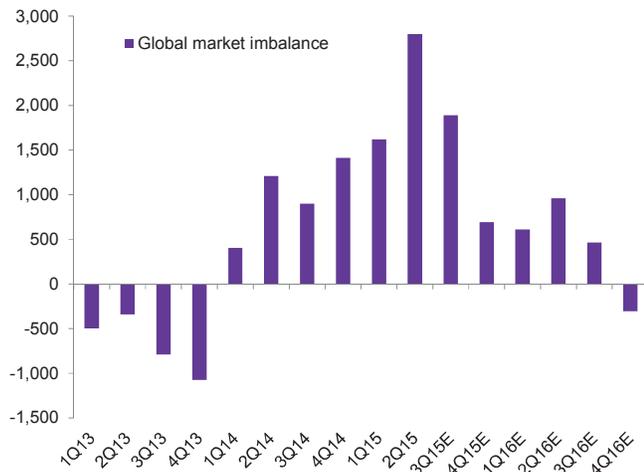
Source: IEA, ICE, Goldman Sachs Global Investment Research.

- Our supply outlook is similar to what occurred in 2015. We forecast more production growth from OPEC, up 615 kb/d yoy vs. 2015, driven by Saudi, Iraq and Iran. For Iran, we assume that production will grow by 260 kb/d on average. We only assume that the Neutral zone output will recover to reach 200 kb/d by end-2016 up from zero currently and 520 kb/d in 2014, leaving risk to our OPEC forecast skewed to the upside.
- This forecast reflects our view that OPEC’s resolve in growing market share has likely strengthened following the pick-up in US activity that occurred this summer once WTI prices returned to \$60/bbl. Despite the fiscal challenges that low oil prices create for OPEC producers, the alternative of reducing production would similarly undermine long-term revenues. As a result we continue to view production growth and the associated investment stimulus to the wider economy as the optimal strategy to help offset these lower revenues, with low-cost OPEC producers likely to expand capacity now that they have pushed output to near max utilization. Even Venezuela has accepted further Chinese financing to produce oil from older fields. Ultimately, the one scenario where we could see OPEC pursuing a cartel strategy and cutting output is one where fundamentals push prices down to the steep part of the cash-cost curve³, a likely outcome should oil demand growth weaken sharply, as we discuss later. However this production cut would occur at much lower oil prices.
- We continue to expect that non-OPEC production outside of the US Lower 48 and NGL will remain resilient, declining only by 220 kb/d in 2016 with growth in the GoM, Canada, Argentina, Brazil and Russia. This reflects our view that the production outlook to 2017 remains broadly determined by investments already made. Importantly, the well-publicized shale cost reduction is occurring globally as well, driven by productivity gains, a substantially stronger dollar and sharp declines in other commodity prices.

Given this slower expected demand growth in the face of growing OPEC production and resilient non-OPEC ex. US production, **we now forecast that US Lower 48 crude and NGL production will need to decline by 585 kb/d in 2016 with other non-OPEC production down 220 kb/d to end the global oil market oversupply by 4Q16**, a similar time frame to what we laid out in our May forecast.

Exhibit 5: We continue to expect that the global oil market will remain in surplus until 4Q16...

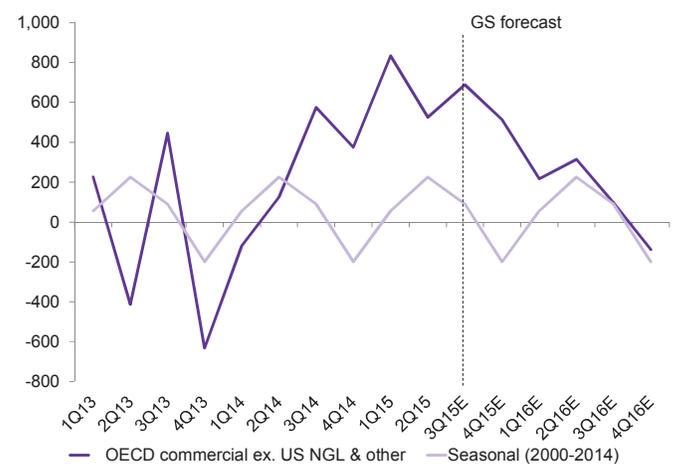
Global supply minus demand (mb/d)



Source: IEA, EIA, JODI, Goldman Sachs Global Investment Research.

Exhibit 6: ... with OECD ex. US NGL stocks building more than the seasonal average over the next 4 quarters

Thousand barrels per day



Source: IEA, EIA, JODI, Goldman Sachs Global Investment Research.

³ See *The New Oil Order*, October 26, 2014

Consistent with our prior forecasts, we continue to view US shale as the likely near-term source of supply adjustment given both the short-cycle nature of shale production and capital as the new margin of adjustment. This is exacerbated by high-quality assets on average owned by weak balance sheets and strong balance sheets owning lower-quality producing assets. This runs opposite to history when weak balance sheets typically owned high-cost assets, creating a linear relationship between lower prices and financial stress which led to more financially motivated supply cuts as prices dropped.

As a result, our updated price forecast requires oil prices to stay lower for longer to achieve a sufficient US and non-OPEC production decline. We now forecast that WTI oil prices need to remain near current levels and below the forward curve through 4Q16, with most downside during shoulder months. Specifically, we are lowering our 1-, 3-, 6- and 12-mo WTI oil price forecast to \$38/bbl, \$42/bbl, \$40/bbl and \$45/bbl from \$45/bbl, \$49/bbl, \$54/bbl and \$60/bbl previously. Our 2016 average price forecast is now \$45/bbl vs. \$57/bbl previously and the forward curve at \$51/bbl. Our WTI-Brent spread forecast remains \$5/bbl except in 2H16 when declining US production in the face of US demand growth, US spare storage capacity and elevated refinery runs lead to rising US crude oil imports and a \$4/bbl differential.

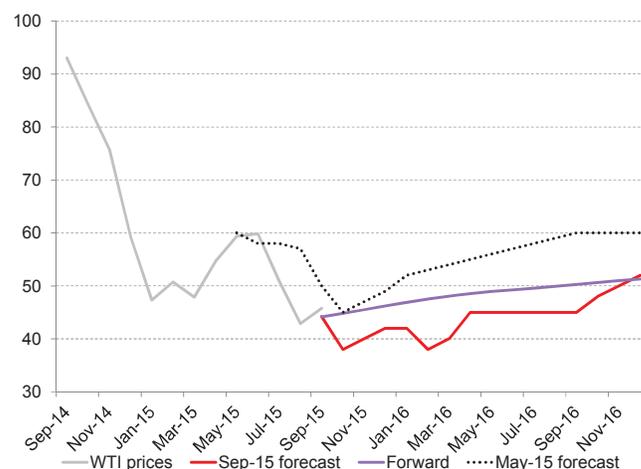
Exhibit 7: We lower our 2015-16 oil price forecasts...
\$/bbl

	WTI forecast	Forwards	May-15 forecast	Brent forecast	Forwards	May-15 forecast
3Q15	46.0	46.0	55.0	51.0	50.9	61.0
4Q15	40.0	45.5	47.0	45.0	49.4	53.0
1Q16	40.0	47.5	53.0	45.0	51.6	58.0
2Q16	45.0	48.9	56.0	50.0	53.4	61.0
3Q16	45.0	49.9	59.0	49.0	54.8	64.0
4Q16	50.0	51.0	60.0	54.0	56.0	65.0
2015	48.1	49.6	52.0	53.7	54.9	58.2
2016	45.0	49.3	57.0	49.5	53.9	62.0
2017	60.0	53.2	60.0	65.0	58.6	65.0

As of Thursday September 10, 2015 close

Source: CME, ICE, Goldman Sachs Global Investment Research.

Exhibit 8: ... and expect prices to remain below current forwards until 2017
\$/bbl



Source: CME, ICE, Goldman Sachs Global Investment Research.

Declining US production is but one path to rebalancing the oil market

It is important to emphasize that as we now believe the market requires non-OPEC production to shift from our prior expectation of modest growth to large declines in 2016, the uncertainty on how that adjustment will take place has increased. In particular, while until now market focus has been on the need to see high yield US E&Ps be forced into maintenance and restructuring– which our US energy credit research team led by Jason Gilbert views as likely with WTI prices remaining at \$35/bbl for six months – the required magnitude of the US production decline in 2016 now needs to include reductions by Investment Grade E&Ps whose production is three times larger than HY E&Ps (Exhibit 9). In other words capital allocation decisions by IG are more likely to drive market rebalancing than HY bankruptcies.

This is important, as ultimately the levers to force HY producers into lower production, such as borrowing basis redeterminations, debt maturities and hedge coverage, are significantly less binding for IG E&Ps. It is instead management’s focus on balancing capex and cash flow and investors’ willingness to finance funding gaps that are the levers of adjustments for this cohort of companies. And while HY debt markets may be once again shutting, tentative signs of greater discipline by US IG E&Ps have so far only translated in stabilizing production guidance rather than pointing to the decline that our global oil balance requires.

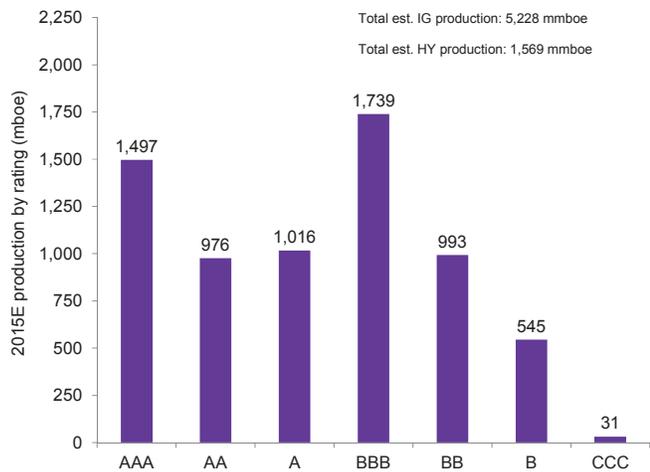
As a result, the sharp intensification in producer financial stress observed recently – with forward oil prices and energy equity share prices at multi-year lows (and credit spreads at highs) – is unlikely to yield sufficient financial stress in the short-term. So while this deterioration in financial conditions is finally reflecting the markets’ decreasing confidence in a quick rebound in prices and a recognition that the rebalancing of supply and demand will likely prove to be far more difficult than previously expected, we now believe that such stress needs to remain in place well into 2016 and up until evidence emerges that US shale production growth is actually required.

This short-term adjustment mechanism is further put at risk by the deeply entrenched expectation – ours included – that the global oil market will require shale production growth within the next couple years. This creates the risk that if investor capital is available to accommodate producers continuing to outspend cash flow, the slowdown in US production will take place too late or not at all, forcing oil markets to clear as they historically have, through a collapse to production costs once the surplus breaches logistical and storage capacity.

Net, while we are increasingly convinced that we need to see lower prices for longer to achieve a production cut, the origin of this production decline and its forcing mechanism is growing uncertain, raising the possibility that we may ultimately clear at a sharply lower price.

Exhibit 9: Rebalancing depends now more on IG behavior given 3x more production than HY

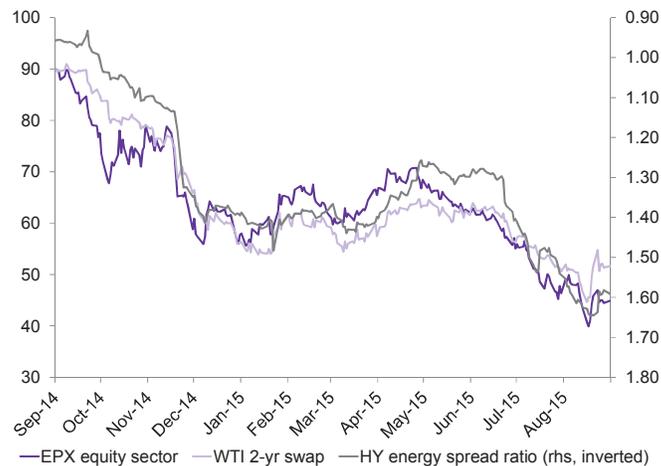
Total US E&P production by credit rating category



Source: Standard & Poor’s, Goldman Sachs Global Investment Research.

Exhibit 10: Financial stress on producers needs to remain elevated to force US production declines

EPX equity sector (indexed to 90 as of Sep-14, lhs); WTI 2-year swap (\$/bbl, lhs); HY Energy spread as a ratio to HY Index spread (rhs, inverted)



Source: Bloomberg.

Operational stress key downside risk to our forecast in coming months

With storage continuing to fill globally and uncertainty on the market's balancing mechanism, the odds of resolving the global balance through a fall to cash costs has increased, although our base case supply-demand forecast doesn't call for it yet.

Although perceptions this past April were that the market was near operational stress, with the floating storage arbitrage briefly open, it is now far closer. We estimate that the industry has added c.240 million barrels of petroleum to crude and product storage tanks from January to August, with 180 mb in OECD stocks exc. NGLs. In addition, 40 million barrels were added to clean and dirty floating storage while OGP stock data implies that China commercial crude and product inventories increased by 40 mb with the Chinese SPR absorbing an additional 110 mb between January and July.

With increased operational stress in the system vs. six months ago, we now attach a substantially higher probability to this being the margin of adjustment than we did in January. Specifically, **we estimate that available identified storage capacity outside China is currently 375 mb, with our balance pointing to a 240 mb ex. China inventory build in between September 2015 and year-end 2016** (Exhibits 11 and 12):

- We estimate OECD available storage capacity at 220 mb as of the end of August. This is comprised of 80 mb of crude oil storage capacity in the US' PADDs 1, 2 and 3, based on historical peak utilization of EIA's assessment of US working storage capacity. US clean product spare capacity (vs. peak stocks) is an additional 30 mb. We also assume that OECD ex.-US storage has similar capacity than when storage peaked in 1999, leaving 110 mb of available storage capacity.
- We proxy non-OECD storage capacity as follows: we identify commercial storage capacity of 290 mb and refinery storage of 600 mb (assuming 7 days of crude and product storage cover on 42 mb/d of runs). Combined this represents almost 900 mb of total storage capacity and assuming that non-OECD storage capacity is as full as OECD ex. US (92%) implies that remaining spare capacity is 70 mb.
- While we have data on total clean and dirty vessel capacity, information on actual loadings is more limited. Based on Argus reported oil in transit and estimated floating storage since 2009, we estimate an additional 85 mb of crude oil can be stored in floating storage before vessel utilization reaches its recent peak of April 2010.

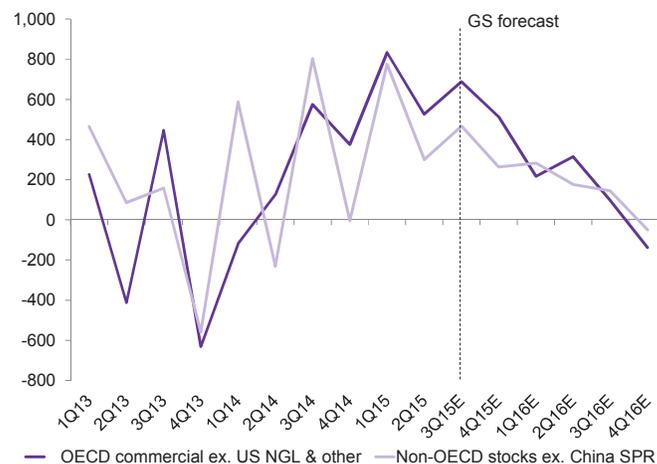
In the case of China, we estimate that the SPR ramp up has absorbed 550 kb/d through July, following a 350 kb/d build out in 2014. Going forward we assume an additional 300 kb/d increase in SPR capacity in 2016, with an additional 100 kb/d build in commercial crude and product stocks.

Exhibit 11: We estimate that remaining identifiable storage capacity is 375 million barrels outside of China...
Million barrels

Region	Spare capacity	Methodology
US PADD1, 2 & 3 crude	80	Peak utilization on EIA working crude storage capacity
US clean products	30	Peak stocks
OECD ex. US	110	Peak stocks
Non-OECD	70	Identified tanks & refinery storage requirement
Floating storage	85	April 2010 peak utilization
Total	375	

Source: Reuters, EIA, IEA, Clarkson, Goldman Sachs Global Investment Research.

Exhibit 12: ... with our projected OECD vs. non-OECD ex. China stock build through 2016 of 240 million barrels
Quarterly changes in stock (thousand barrels per day)



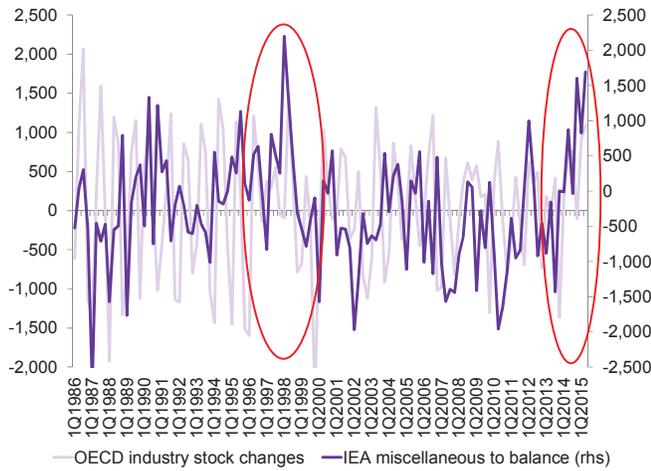
Source: EIA, IEA, Goldman Sachs Global Investment Research.

Importantly, we acknowledge that the uncertainty around this estimated spare storage capacity is significant. First, there is uncertainty on the starting point of storage utilization with our end-of-August OECD stocks based on our balance and high frequency stock data. Second, while our own implied miscellaneous to balance is lower than the IEA’s given our accounting of non-OECD storage builds (where data is available) and China stocks, it has nonetheless averaged 200 kb/d over the last twelve months, with some of these missing barrels likely ending in non-OECD inventories as we believe was the case in 1998-99 (Exhibit 13). The backlog of drilled but uncompleted shale wells, another feature of the New Oil Order, complicates this margin of adjustment even further, as the “fracklog” is just another form of storage.

Finally, even if our assessed storage capacity estimate is roughly correct, a combined error on our 2016 production (higher) and demand (lower) forecasts of 370 kb/d would ultimately fill our assessed spare storage capacity. This could be achieved for example with global growth of 2.75% (Exhibit 4) or more resilient US production than we model.

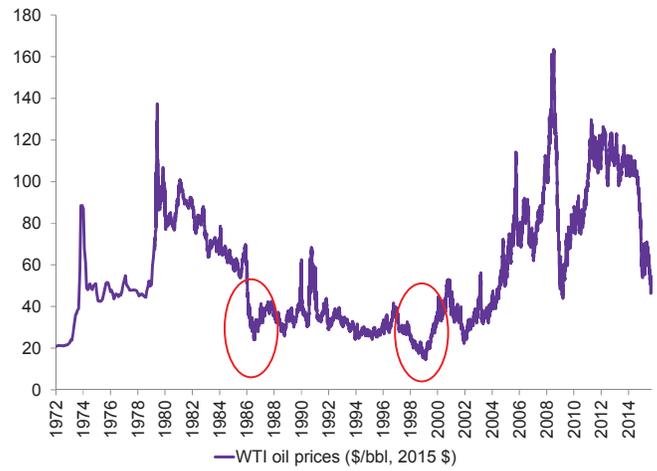
Given our forecast for rising inventories through 4Q16, the probability of breaching storage capacity constraints will be highest this autumn and during next spring’s refinery turnarounds. The first step would be the opening of the floating storage arbitrage which on our calculations is nearly open, requiring little further steepening of the Brent forward curve at current freight rates. In the event that storage fills faster than we forecast or capacity is lower than we model, the potential downside to our oil price forecast from hitting storage capacity is significant as it requires forcing production lower and back in line with demand, as occurred in 1998 (Exhibit 14).

Exhibit 13: We believe that most of the miscellaneous to balance represents non-OECD stock builds, like in 1998
 Quarterly stock changes, thousand barrels per day



Source: IEA.

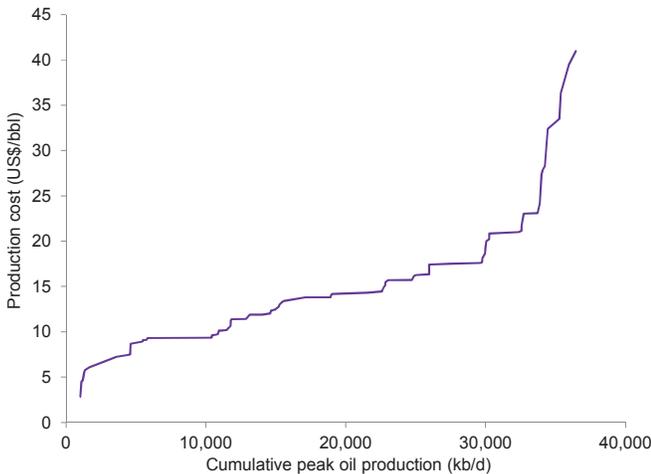
Exhibit 14: Operational stress ultimately brings spot and forward prices down to cash costs
 2015 \$/bbl



Source: CME, EIA, Goldman Sachs Global Investment Research.

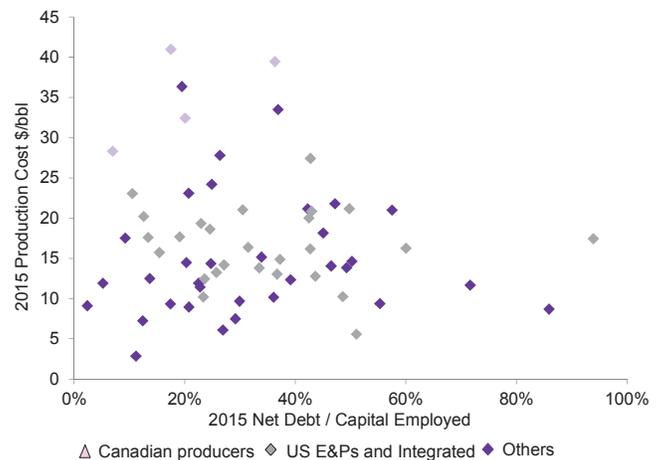
From a level perspective, we estimate high cost producers have operating breakevens in the \$30/bbl Brent prices. However these producers, typically Canadian oil sands producers, have also limited leverage and elevated fixed costs to shutting down production. As a result, a fall to cash costs could likely take prices instead to the highly levered high-cost US shale producers, whose cash breakevens are closer to \$20/bbl, on our estimates (Brent equivalent).

Exhibit 15: The highest cash costs are near \$30/bbl...
 Oil cash cost (in Brent equivalent \$/bbl)



Source: Wood Mackenzie, Goldman Sachs Global Investment Research.

Exhibit 16: ... but are for low levered producers
 2015 production costs (\$/bbl) vs. net debt/capital employed



Source: Wood Mackenzie, Goldman Sachs Global Investment Research.

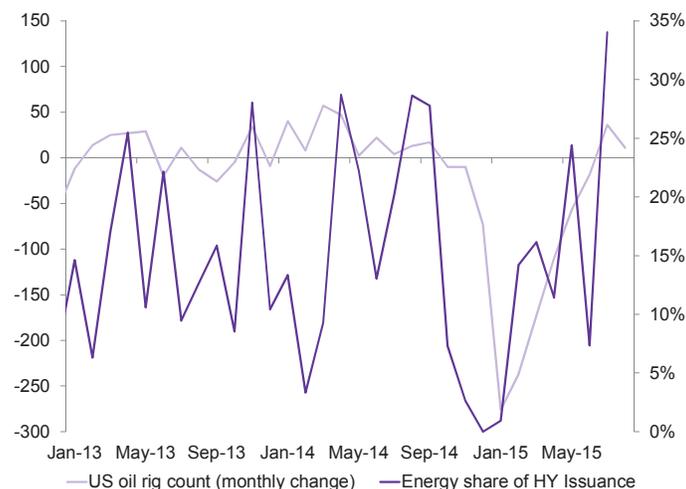
US shale growth not required until 2017

Under our updated oil supply and demand forecast, we believe the market only requires US production growth in 2017 (of 300 kb/d), and as a result maintain our 2017 \$60/bbl WTI price forecast, with prices trading by then above our US shale \$55/bbl breakeven forecast. Our longer-term forecast is unchanged as well with continued productivity gains bringing these numbers lower by \$10/bbl by 2020⁴.

Although our 2017 WTI forecast now sits above the forward curve given the recent sell off, we would not interpret that as a signal to buy long-dated oil. Historically, once the storage arbitrage that connects spot to forward prices is no longer needed, bear markets typically end with a sharp sell-off in long-dated prices that creates a shift in producer and investor behavior.

A sharper decline in US production than we expect or a more limited increase in OPEC production could require an earlier recovery in US production. However we see several potential catalysts for an even later required increase in US production such as weaker global demand and more resilient non-OPEC ex. US production (as long as storage capacity isn't breached). Further, the consequence of this New Oil Order is that any sustainable price rally can quickly impact forward fundamentals. This spring's rally did prove to be self-defeating as reopened capital markets lead to producers redeploying rigs (Exhibit 17)⁵. This reinforces our conviction that sustainability low spot and forward prices are required until there is greater confidence that US shale growth is indeed required.

Exhibit 17: US producers ramped up activity once funding markets reopened
Energy share of HY US debt issuance (rhs), monthly change in the US oil rig count (lhs)



Source: Dealogic, BHI.

A later and shallow recovery

While we forecast that the supply and demand for the barrels of oil will likely find a balance by the end of 2016, this doesn't mean a sharp rebound in prices will occur quickly as many

⁴ See *Reality of oil market will trump perception and positioning*, May 18 2015 & *Top 420: Shale and OPEC fight for market share; rest of industry fights for relevance*, May 15, 2015

⁵ See *A self negating rally*, May 11, 2015

other factors will likely weigh on prices, as we argued in *A lost decade reinforces lower for longer*, August 6, 2015.

As we have noted before, it is important to emphasize that markets have never seen such a large appreciation in the US dollar at the same time they have seen such a large surplus in the oil market, exacerbating both the downward pressure on EM commodity importers and EM commodity production costs. This not only impacts emerging market demand for oil, Latin American demand in particular, but also lowers the costs to produce oil in these countries. We find for example that a 10% move in BRL or CAD shifts cash costs by 3% and 5% respectively. The BRL and CAD have weakened year-to-date by 45% and 14%, respectively, and it is no surprise that 2015 supply growth in regions facing sharp currency depreciation such as Brazil and Russia have been persistently revised higher by the IEA, by a cumulative 350 kb/d since March.

Further, if operational stress is required with a decline in prices to near \$20/bbl, such a drop would prove transient and help to immediately rebalance the supply and demand for barrels. However, it would likely do little for the longer-term capital imbalance in the market. New capital would likely take ownership of higher quality assets and capex would actually rise again in places like the US. Only expectations for lower prices for longer will rebalance the capital markets for energy, which creates downside risks to our 2017 price forecasts as well.

Not only will the macro forces such as US dollar appreciation and weaker EM economic growth keep prices under pressure, but historically markets trade near cash costs until new incremental higher-cost capacity is needed. In addition, low-cost OPEC producers are likely to expand capacity now that they have pushed output to capacity. Ultimately, the capital markets for energy need to be rebalanced through consolidation and capital restructuring.

Balance table breakdown

Exhibit 18: Global supply-demand balance (thousand barrels per day)

	1Q13	2Q13	3Q13	4Q13	1Q14	2Q14	3Q14	4Q14	1Q15	2Q15	3Q15E	4Q15E	1Q16E	2Q16E	3Q16E	4Q16E
Supply	90,304	91,165	91,666	91,795	92,173	93,064	94,157	95,303	95,246	96,302	96,550	96,155	95,660	95,888	96,394	96,143
Demand	90,802	91,507	92,456	92,871	91,771	91,854	93,257	93,890	93,627	93,504	94,662	95,461	95,050	94,929	95,928	96,448
Global market imbalance	-498	-342	-790	-1,076	402	1,210	900	1,413	1,619	2,798	1,888	694	610	959	466	-305
OECD commercial stocks	196	-34	409	-1,358	194	760	752	-91	929	1,096	709	-30	52	480	151	-410
OECD commercial ex. US NGL & other	226	-412	446	-631	-119	125	575	376	833	526	688	514	217	315	96	-138
OECD gvt stocks	131	-40	66	24	-12	-47	-31	10	15	21	0	0	0	0	0	0
OECD stocks	327	-74	474	-1,334	182	713	721	-81	944	1,117	709	-30	52	480	151	-410
Non-OECD stocks ex. China SPR	464	85	158	-559	588	-231	804	-4	775	300	466	263	283	177	144	-50
China SPR	-11	269	220	176	323	568	97	427	373	472	639	386	275	302	272	255
Identified stocks	780	281	852	-1,717	1,093	1,050	1,622	342	2,093	1,890	1,813	619	610	959	566	-205
Floating Storage/Oil in Transit	150	-99	174	266	256	-346	337	-109	-128	220	75	75	0	0	-100	-100
GS Miscellaneous to balance	-1,428	-524	-1,816	375	-947	506	-1,059	1,180	-346	689	0	0	0	0	0	0

Source: IEA, JODI, Argus, EIA, Goldman Sachs Global Investment Research.

Exhibit 19: Global demand estimates (thousand barrels per day)

	1Q2014	2Q2014	3Q2014	4Q2014	1Q2015	2Q2015	3Q2015E	4Q2015E	1Q2016E	2Q2016E	3Q2016E	4Q2016E	2014	2015	2016	2017	yoy 14	yoy 15	yoy 16	yoy 17
USA	19,143	19,060	19,609	19,825	19,618	19,544	20,019	20,113	19,705	20,196	20,406	20,071	19,409	19,823	20,095	20,207	146	414	271	112
Canada	2,415	2,321	2,443	2,405	2,365	2,229	2,441	2,402	2,316	2,244	2,393	2,337	2,396	2,359	2,322	2,342	21	-37	-37	20
Mexico	1,995	2,016	1,997	2,018	1,912	1,947	2,003	2,012	1,924	1,957	2,023	2,037	2,006	1,968	1,985	2,011	-85	-38	17	25
North America	23,553	23,396	24,049	24,248	23,895	23,720	24,462	24,526	23,945	24,397	24,822	24,445	23,812	24,151	24,402	24,560	83	339	251	157
Brazil	3,120	3,171	3,285	3,313	3,171	3,168	3,347	3,344	3,109	3,141	3,343	3,347	3,222	3,258	3,235	3,235	104	35	-23	0
Chile	335	333	331	316	347	346	352	334	356	365	360	313	329	345	348	329	-18	16	4	-20
LatAm ex. Mexico, Brazil, Chile	3,514	3,639	3,683	3,638	3,577	3,710	3,676	3,638	3,564	3,710	3,758	3,718	3,619	3,650	3,688	3,708	61	32	37	20
LatAm ex. Mexico	6,969	7,143	7,299	7,267	7,095	7,224	7,375	7,316	7,028	7,215	7,460	7,379	7,170	7,252	7,271	7,271	147	83	18	0
OECD Europe	12,968	13,347	13,772	13,420	13,571	13,393	13,939	13,686	13,573	13,619	14,072	13,724	13,377	13,647	13,747	13,768	-208	270	100	21
Non-OECD Europe	660	669	689	686	695	688	692	705	698	714	706	721	676	695	710	730	18	19	15	20
Total Europe	13,628	14,016	14,461	14,106	14,266	14,081	14,631	14,391	14,271	14,333	14,778	14,445	14,053	14,342	14,457	14,498	-190	289	114	41
Japan	5,080	3,933	3,929	4,478	4,810	3,888	3,886	4,347	4,729	3,859	3,807	4,275	4,355	4,233	4,168	4,062	-205	-122	-65	-106
South Korea	2,351	2,308	2,322	2,378	2,483	2,318	2,386	2,457	2,520	2,393	2,378	2,393	2,340	2,411	2,421	2,400	11	71	10	-21
Australia & New Zealand	1,232	1,229	1,224	1,261	1,261	1,217	1,233	1,280	1,275	1,238	1,262	1,311	1,236	1,248	1,272	1,308	2	11	24	36
Israel	237	230	235	229	238	236	239	232	242	240	242	236	233	236	240	255	-9	3	4	15
OECD Asia Pacific	8,900	7,700	7,710	8,346	8,792	7,659	7,744	8,316	8,766	7,729	7,689	8,214	8,164	8,128	8,100	8,025	-201	-36	-28	-75
China	10,266	10,535	10,496	10,940	10,703	11,108	10,817	11,141	11,095	11,298	11,227	11,533	10,559	10,942	11,288	11,588	309	383	346	300
India	3,824	3,832	3,572	3,805	3,956	3,989	3,746	3,907	4,098	4,110	3,915	4,075	3,758	3,899	4,050	4,163	69	141	150	114
Other non-OECD Asia	8,252	8,245	8,191	8,362	8,458	8,511	8,200	8,662	8,538	8,575	8,560	8,777	8,263	8,458	8,613	8,747	160	195	155	134
Total Asia	22,342	22,612	22,259	23,107	23,117	23,608	22,763	23,710	23,731	23,983	23,702	24,385	22,560	23,299	23,951	24,498	538	719	651	548
FSU	4,627	4,813	5,038	4,915	4,613	4,813	4,974	4,929	4,603	4,798	4,973	4,955	4,848	4,832	4,832	4,872	132	-16	0	40
Total Middle East	7,770	8,173	8,549	7,913	7,771	8,316	8,746	8,141	7,948	8,437	8,875	8,274	8,101	8,244	8,384	8,524	196	142	140	140
Total Africa	4,002	4,003	3,894	3,983	4,111	4,092	3,966	4,113	4,243	4,199	4,099	4,254	3,971	4,071	4,199	4,319	80	100	128	120
OECD demand	45,756	44,777	45,862	46,330	46,606	45,118	46,497	46,862	46,640	46,111	46,943	46,696	45,681	46,271	46,598	46,682	-344	589	327	84
non-OECD demand	46,035	47,080	47,397	47,555	47,055	48,395	48,165	48,580	47,896	48,982	49,456	49,654	47,017	48,049	48,997	50,213	1,128	1,032	948	1,216
World Demand	91,791	91,857	93,259	93,885	93,627	93,504	94,662	95,461	95,050	94,929	95,928	96,448	92,698	94,314	95,589	96,889	784	1,616	1,275	1,300

Source: IEA, EIA, JODI, China NBS, Goldman Sachs Global Investment Research.

Exhibit 20: Global supply estimates (thousand barrels per day)

	1Q2014	2Q2014	3Q2014	4Q2014	1Q2015E	2Q2015E	3Q2015E	4Q2015E	1Q2016E	2Q2016E	3Q2016E	4Q2016E	2014	2015	2016	2017	yoy 14	yoy 15	yoy 16	yoy 17
US Lower 48	6,471	6,917	7,213	7,547	7,622	7,685	7,560	7,440	7,265	7,100	6,960	6,880	7,037	7,577	7,051	7,326	1,169	539	-525	275
US NGL	2,654	2,897	3,066	3,064	3,043	3,243	3,265	3,255	3,205	3,150	3,105	3,105	2,920	3,201	3,141	3,176	364	281	-60	35
US GoM	1,319	1,417	1,428	1,421	1,431	1,470	1,510	1,535	1,520	1,560	1,565	1,580	1,396	1,487	1,556	1,556	142	90	70	0
Alaska	582	566	457	555	547	530	470	525	510	500	470	500	540	518	495	475	-24	-22	-23	-20
US ethanol	909	941	931	959	956	944	970	940	955	945	940	940	935	952	945	945	69	17	-7	0
Total US	11,936	12,737	13,095	13,546	13,599	13,872	13,775	13,695	13,455	13,255	13,040	13,005	12,829	13,735	13,189	13,479	1,720	906	-546	290
Canada	4,311	4,155	4,208	4,435	4,559	4,000	4,350	4,460	4,475	4,190	4,490	4,555	4,277	4,342	4,428	4,503	278	65	85	75
Mexico	2,869	2,845	2,764	2,717	2,651	2,545	2,570	2,550	2,460	2,420	2,400	2,375	2,799	2,579	2,414	2,289	-91	-220	-165	-125
Total North America	19,116	19,738	20,068	20,699	20,808	20,417	20,695	20,705	20,390	19,865	19,930	19,935	19,905	20,656	20,030	20,270	1,907	751	-626	240
Argentina	640	627	633	638	647	650	655	665	670	680	690	695	635	654	684	714	-7	20	30	30
Brazil	2,176	2,286	2,419	2,522	2,539	2,485	2,475	2,485	2,535	2,550	2,575	2,585	2,351	2,496	2,561	2,636	231	145	65	75
Colombia	1,003	971	993	1,009	1,033	1,025	975	990	975	960	950	950	994	1,006	956	936	-18	12	-50	-20
Other Latam	432	435	440	440	428	404	412	415	405	400	400	395	437	415	400	390	10	-22	-15	-10
Non-OPEC LatAm	4,251	4,318	4,486	4,610	4,647	4,563	4,517	4,555	4,585	4,590	4,615	4,614	4,416	4,571	4,601	4,676	216	154	30	75
Norway	1,960	1,791	1,858	1,970	1,930	1,929	1,925	1,935	1,945	1,860	1,895	1,960	1,895	1,930	1,915	1,865	57	35	-15	-50
UK	985	912	714	895	936	1,000	850	960	960	935	795	915	876	936	901	891	-22	60	-35	-10
Other Europe	704	686	705	740	716	698	684	675	665	647	638	647	709	693	651	621	-21	-16	-42	-30
Total Europe	3,650	3,389	3,277	3,605	3,582	3,627	3,459	3,570	3,570	3,451	3,337	3,513	3,480	3,559	3,468	3,378	14	79	-92	-90
Azerbaijan	895	883	868	787	872	841	830	810	840	820	800	760	858	838	805	770	-26	-20	-33	-35
Kazakhstan	1,710	1,643	1,679	1,730	1,732	1,670	1,635	1,665	1,680	1,615	1,595	1,655	1,691	1,676	1,631	1,611	-22	-15	-44	-20
Russia	10,926	10,870	10,843	11,004	11,024	11,030	11,070	11,120	11,130	11,120	11,180	11,275	10,911	11,061	11,176	11,341	113	150	115	165
Other FSU	416	387	413	410	419	429	420	415	415	410	410	410	406	421	411	406	0	14	-9	-5
Total FSU	13,948	13,782	13,803	13,931	14,046	13,969	13,955	14,010	14,045	13,965	13,985	14,100	13,866	13,995	14,024	14,129	64	129	29	105
China	4,235	4,231	4,168	4,260	4,286	4,363	4,270	4,295	4,285	4,260	4,225	4,285	4,223	4,304	4,264	4,229	47	80	-40	-35
India	882	874	856	888	872	862	865	860	840	835	830	830	875	865	834	809	-3	-10	-31	-25
Indonesia	844	843	837	819	807	844	865	870	885	885	880	865	836	847	879	849	-38	11	32	-30
Malaysia	659	661	633	725	783	731	707	700	725	715	685	675	669	730	700	690	26	61	-30	-10
Rest of Asia-Pacific	1,633	1,621	1,607	1,619	1,585	1,587	1,630	1,625	1,605	1,590	1,605	1,590	1,620	1,607	1,598	1,593	-4	-13	-9	-5
Non-OPEC Asia	8,251	8,229	8,100	8,310	8,333	8,387	8,337	8,350	8,340	8,285	8,225	8,245	8,223	8,352	8,274	8,169	28	129	-78	-105
Non-OPEC Middle East	1,351	1,320	1,324	1,298	1,304	1,215	1,174	1,160	1,154	1,143	1,137	1,126	1,323	1,213	1,140	1,065	-34	-110	-73	-75
Non-OPEC Africa	2,324	2,318	2,300	2,323	2,317	2,300	2,243	2,245	2,222	2,194	2,195	2,225	2,316	2,276	2,209	2,169	66	-40	-67	-40
Processing gains	2,209	2,188	2,244	2,215	2,255	2,230	2,265	2,250	2,285	2,260	2,315	2,285	2,214	2,250	2,286	2,321	36	36	36	35
Other Biofuels	786	1,394	1,609	1,363	923	1,465	1,714	1,400	985	1,435	1,785	1,435	1,288	1,375	1,410	1,440	147	87	35	30
Total non-OPEC supply	55,887	56,678	57,211	58,354	58,215	58,173	58,360	58,245	57,575	57,188	57,524	57,478	57,032	58,248	57,441	57,616	2,445	1,216	-807	175
Non-OPEC ex. US Lower 48 & NGL	46,761	46,864	46,932	47,742	47,551	47,245	47,535	47,550	47,105	46,938	47,459	47,493	47,075	47,470	47,249	47,114	912	395	-221	-135
Algeria	1,066	1,143	1,147	1,127	1,107	1,110	1,095	1,090	1,065	1,065	1,060	1,055	1,121	1,100	1,061	1,021	-28	-20	-39	-40
Angola	1,574	1,630	1,715	1,724	1,766	1,760	1,785	1,810	1,765	1,750	1,730	1,715	1,661	1,780	1,740	1,680	-58	120	-40	-60
Ecuador	550	553	555	547	546	547	535	530	525	520	510	505	551	539	515	490	35	-12	-24	-25
Iran	2,819	2,840	2,785	2,803	2,816	2,850	2,850	2,850	2,950	3,050	3,150	3,250	2,812	2,841	3,100	3,300	130	30	259	200
Iraq	3,287	3,329	3,225	3,484	3,492	3,911	4,025	3,985	4,000	4,100	4,100	4,075	3,331	3,853	4,069	4,219	252	522	215	150
Kuwait	2,786	2,797	2,838	2,779	2,800	2,767	2,730	2,745	2,765	2,800	2,835	2,870	2,800	2,760	2,818	2,868	-9	-39	57	50
Libya	367	227	574	666	373	463	400	400	400	400	400	400	459	409	400	400	-443	-50	-9	0
Nigeria	1,933	1,913	1,887	1,877	1,813	1,783	1,770	1,755	1,710	1,680	1,655	1,640	1,902	1,780	1,671	1,571	-50	-122	-109	-100
Qatar	720	708	715	680	673	663	655	650	640	640	630	630	706	660	635	610	-23	-45	-25	-25
Saudi Arabia	9,721	9,715	9,804	9,637	9,868	10,326	10,350	10,050	10,100	10,550	10,600	10,300	9,719	10,140	10,400	10,575	58	430	251	175
UAE	2,734	2,742	2,805	2,752	2,840	2,873	2,925	2,945	3,000	3,015	3,030	3,040	2,758	2,896	3,021	3,081	-4	137	125	60
Venezuela	2,448	2,480	2,480	2,440	2,394	2,440	2,410	2,400	2,380	2,370	2,360	2,350	2,462	2,411	2,365	2,300	-34	-51	-46	-65
Total OPEC Crude	30,004	30,078	30,531	30,515	30,488	31,494	31,530	31,210	31,350	31,940	32,060	31,830	30,282	31,180	31,795	32,114	-175	898	615	319
Total OPEC NGL	6,283	6,309	6,415	6,435	6,544	6,636	6,661	6,700	6,735	6,760	6,810	6,835	6,360	6,635	6,785	6,910	173	275	150	125
Total OPEC supply	36,287	36,387	36,946	36,950	37,031	38,129	38,191	37,910	38,085	38,700	38,870	38,665	36,642	37,815	38,580	39,024	-3	1,173	765	444
World supply	92,173	93,064	94,157																	

Disclosure Appendix

Reg AC

We, Damien Courvalin, Jeffrey Currie, Abhisek Banerjee, Raquel Ohana and Michael Hinds, hereby certify that all of the views expressed in this report accurately reflect our personal views, which have not been influenced by considerations of the firm's business or client relationships.

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