Global Energy Report

China Merchants Futures (Hong Kong)
Hong Kong Commodities Research

The rising tide of oil ahead

- **Epic build up in crude oil inventories with more to come in 4Q15**
- **Supply overhang puts downward pressure on crude oil prices**
- **Possible relief in 2H16 when U.S. production drops**

Epic build up in crude oil inventories

This year's build up in crude oil and petroleum product inventories has been epic, with global crude oil inventories currently at multi-decade highs. Persistent oversupply on the part of OPEC members, such as Saudi Arabia, in a determined push to increase global crude oil market share is a main factor to the global oil glut. Another factor is the slower-than-expected decline in U.S. shale oil production. It could be another 6 months before we see a significant dent in U.S. crude oil production.

Consensus estimates need to be lowered

2015E crude oil prices look aggressive with estimates for Brent at US$60.6/bbl and WTI at US$54.9/bbl. However, 1H15 Brent and WTI crude prices have averaged US$58.9/bbl and US$50.77/bbl (below the industry average). With peak seasonal demand for crude beginning to fade and a weak global economy, it will be difficult to have higher 2H15 crude oil prices going forwards. We believe that 2H15 Brent/WTI crude oil prices will average US$50.50/US$46/bbl, which will result in full-year prices averaging US$54.8/US$48.5/bbl. Beyond 2015, we expect Brent crude prices to be relatively flat while we expect WTI to rise to US$53/bbl, narrowing the WTI-Brent discount to around US$2/bbl as U.S. oil production pulls back.

What are the bright spots?

U.S. crude oil production seems to have peaked. After moth-balling more than half of U.S. onshore rigs over the past year, we may have just seen the inflection point in U.S. domestic crude oil production. Production was seen highest during the week of 5 June 2015 at 9.61mmbd. Since then, crude oil production has come down to 9.40mmbd. The 18,125b/d per week drop in production means that we could see a 1mmbd reduction in U.S. crude oil production by July 2016, which would likely boost crude oil prices by 2H16.

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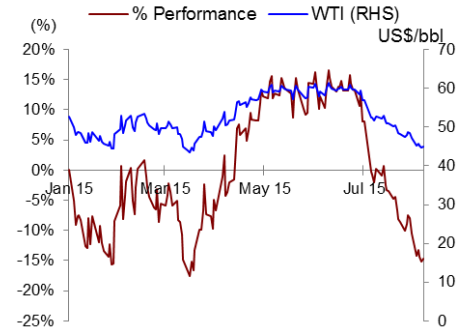
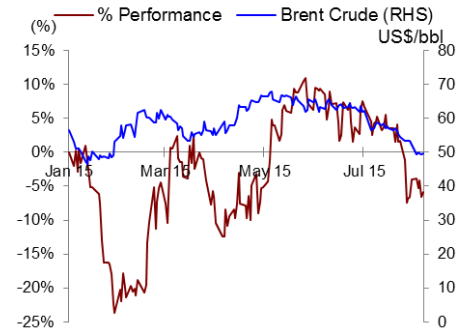
Price Performance





Source: Bloomberg, CMF(HK)

Absolute return (%)	1m	6m	12m
WTI Crude	(13.9)	(12.8)	(53.7)
Brent Crude	(12.0)	(13.5)	(52.6)

Related Research

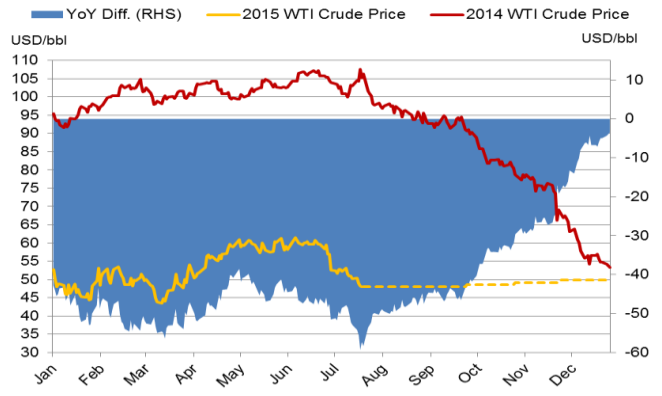
Price Update

Front Contract	Close	Prev	Change (US$)	Change (%)	High	Low	Range (US$)	Range (%)
WTI	44.76	44.66	0.10	0.22%	44.88	44.71	0.17	0.38%
Brent	49.66	49.52	0.14	0.28%	49.70	49.55	0.15	0.30%
Natural Gas	2.82	2.81	0.00	0.14%	2.82	2.80	0.02	0.79%
RBOB Gasoline	165.03	164.78	0.25	0.15%	165.44	164.83	0.61	0.37%
IPE LS Gasoil	471.25	464.50	6.75	1.43%	471.25	469.50	1.75	0.37%
EURUSD	1.0913	1.0925	(0.0012)	(0.11%)	1.0931	1.0911	0.0020	0.18%
Dollar Index (Spot)	97.8840	97.8330	0.0510	0.05%	97.9090	97.7710	0.1380	0.14%

Source: Bloomberg, CMF (HK)

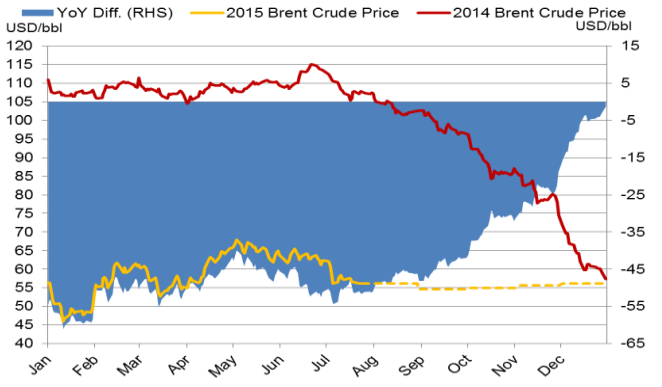
Focus charts

Figure 1: 2014 vs. 2015E WTI crude price



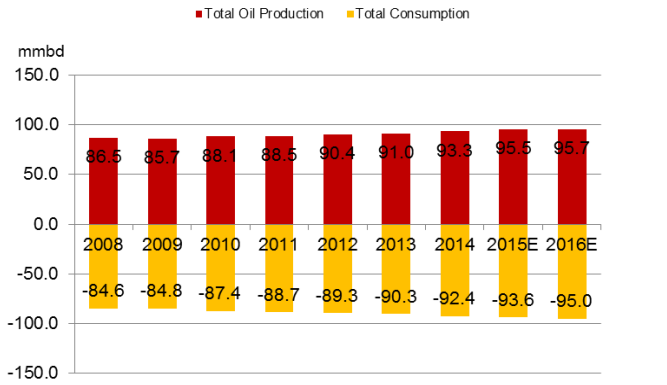
Source: Bloomberg, CMS (HK)

Figure 2: 2014 vs. 2015E Brent crude price



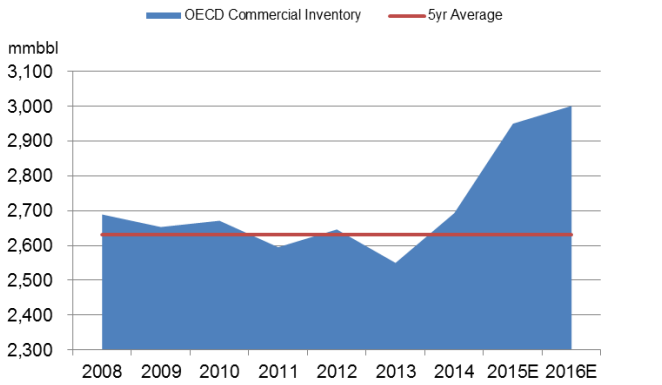
Source: Bloomberg, CMS (HK)

Figure 3: World liquids supply-demand



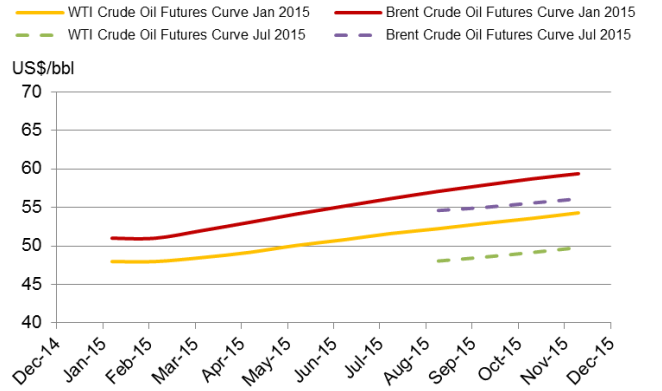
Source: Bloomberg, CMS (HK)

Figure 4: OECD petroleum and other liquids inventory



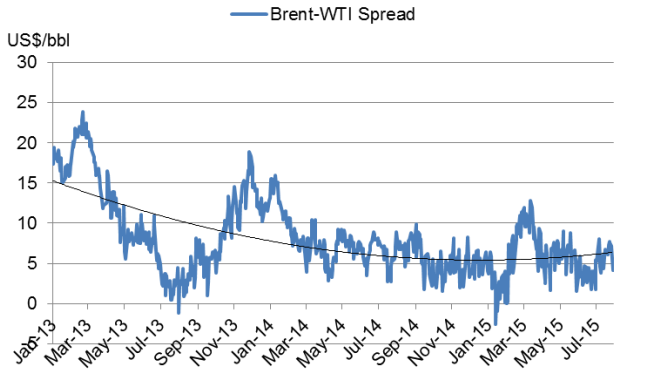
Source: Bloomberg, CMS (HK)

Figure 5: WTI and Brent Crude futures curve



Source: Bloomberg, CMS (HK)

Figure 6: Brent-WTI spread



Source: Bloomberg, CMS (HK)

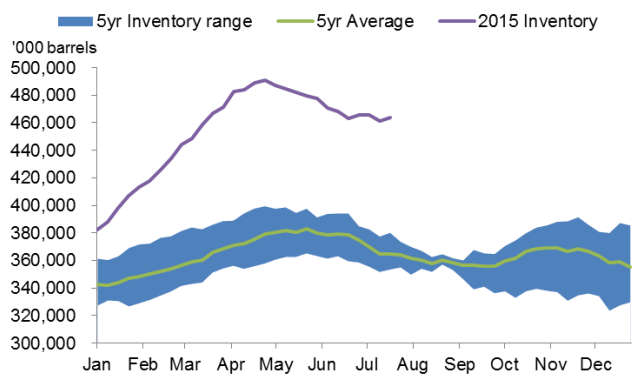
Epic build up in crude oil inventories

- This year's build up in crude oil and petroleum product inventories has been epic. Global crude oil inventories are currently at multi-decade highs with the IEA estimating over 2,832 million barrels (mmbbl) of crude stored in OECD commercial inventories around the world. Of this amount, around 463mmbbl are in the U.S. where crude oil inventories are the highest since weekly data began being collected in 1982.
- Persistent oversupply on the part of OPEC members, such as Saudi Arabia, in a determined push to increase global crude oil market share is a main factor to the global oil glut. OPEC supply has risen by 1.3 million barrels per day (mmbd) since the cartel announced last November to defend its market share at the expense of price, pumping more than 31.7mmbd in June based on IEA estimates. This strategy has been successful in reversing the decline in OPEC supplied crude that started in 2012.
- Another factor is the slower-than-expected decline in U.S. shale oil production, which despite more than 50% of total U.S. land rigs being mothballed is stable. This is evident in data showing U.S. domestic field production of crude oil being maintained at over 9.5mmbd throughout 2015 even as prices dropped. Although an inflection point may have surfaced during recent weeks. It could be another 6 months before we see a significant dent in U.S. crude oil production.

Inventories should go higher in 3Q15

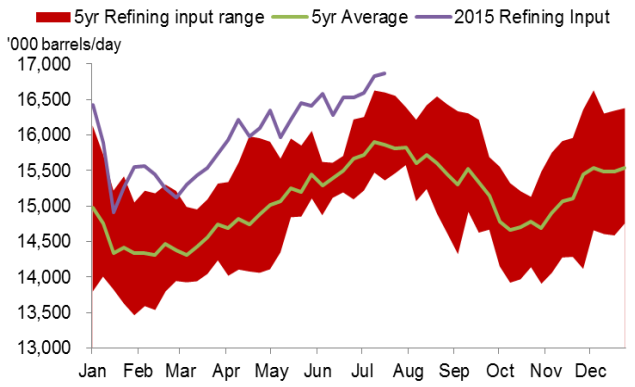
- U.S. crude oil inventories began dipping around late-April as refineries ramped up production in preparation for the summer driving season. This caused inventories to drop by over 27mmbbl since this year's peak. However, the production ramp up could be nearing an end as sufficient inventories of refined products like gasoline and diesel has already been built.
- Normally, demand seasonality causes refinery inputs to peak in July and trend downwards, afterwards, until reaching a bottom in October. The annual October lows usually correspond to input levels seen at the beginning of 2Q (around April). Hence, if the same pattern repeats itself this year, about 941,000 barrel per day (bd) less crude will eventually be needed in the coming months.
- Such a reduction in refinery input could exacerbate the current high inventory situation. All things equal, we could see U.S. crude oil inventories build by 46mmbbl by October if the growth in refining inputs made a similar reversion in the coming weeks ahead.

Figure 7: U.S. commercial crude oil inventory



Source: EIA, CMF (HK)

Figure 8: U.S. refiner net input of crude oil



Source: EIA, CMF (HK)

What is NOT affecting crude oil prices

- Conventional wisdom points to factors such as crude oil inventories, and the strength of the USD versus other currencies such as the Euro or even the RMB as factors that impact the price of crude oil. The former's logic is that high inventories are a sign of oversupply and hence lower prices are needed to incentivize consumers to use more crude in order to rebalance supply-demand dynamics. While the latter relates to higher purchasing costs by countries/industries that are negatively affected by a strengthening US dollar thus requiring a lower crude oil price to offset rising costs.

- Although these factors may have affected crude oil prices at different times in the past, their impact during 2015 has been mute. Simple correlations between these factors and WTI/Brent futures price shows how inept the increase U.S. crude oil inventories have been in affecting prices (ρ = -0.049/0.125), while the rise in the USD (versus Euro: ρ = -0.323/-0.272; versus CNH: ρ = -0.114/-0.067) has only moderate relationship with crude oil price changes.

Correlation coefficient (ρ)	WTI	Brent Crude
WTI / Brent	1.000 / 0.890	0.890 / 1.000
USDEUR	-0.323	-0.272
US Crude Inventory	-0.049	0.125
USDCNH	-0.114	-0.067

Source: Bloomberg, CMF (HK)

- Given the weak correlations between crude oil's fundamental factors and price, we see 1) supply uncertainties; 2) market participation (or lack of); 3) and economic headwinds as the more obscure forces influencing crude oil prices.

Consensus estimates look too aggressive

- Expectations for 2015 crude oil prices still look aggressive with the mean of industry estimates for Brent at US$60.6/bbl and WTI at US$54.9/bbl. Bear in mind that 1H15 Brent and WTI crude prices have averaged US$58.9/bbl and US$50.77/bbl (below the industry average), respectively. Furthermore, with peak seasonal demand for crude beginning to fade and a weak global economy, it will be difficult to have higher 2H15 crude oil prices going forwards.

- We believe that crude oil price expectations will have to be "rebooted" after the summer driving season ends (end-of August). We believe that 2H15 Brent/WTI crude oil prices will average US$50.50/US$46 per barrel, which will result in full-year prices averaging US$54.8/US$48.5 per barrel. Beyond 2015, we expect Brent crude prices to be relatively flat as increased production from Saudi Arabia, Iraq, and newly embargo-free Iran continue to oversupply the market, even outpacing increased demand for oil. For WTI, we expect prices to average US$53/bbl, thus narrowing the WTI-Brent discount (to around US$2/bbl in 2016 vs. the current US$5/bbl) as U.S. shale oil production declines become more apparent. We believe that the spread could disappear entirely by 2017.

	Brent				WTI			
USD/barrels	4Q15E	2015E	2016E	2017E	4Q15E	2015E	2016E	2017E
Consensus Estimates								
Median	63.3	60.9	69.4	75.0	56.5	54.7	63.8	70.0
Mean	63.1	60.6	69.0	75.9	57.2	54.9	63.8	70.5
Highest Estimate	72.0	65.0	86.0	95.0	67.0	60.0	81.0	90.0
Lowest Estimate	53.0	56.7	57.3	60.0	47.0	51.3	52.8	56.0
CMF (HK)		**54.8**	**55.0**	**56.0**		**48.5**	**53.0**	**56.0**

Source: Reuters, CMF (HK)

Higher production overhang puts downward pressure on crude oil prices

OPEC production continues to increase

- OPEC crude oil production during 1H15 has increased 3.4%YoY or about 1.02mmbd. The main contributors of the increase are Iraq, Saudi Arabia, Libya and UAE, who in aggregate have boosted OPEC production by 1.07mmbd. While Libya and the UAE are important in their own right, all eyes are on Saudi Arabia and Iraq for any meaningful further production growth from OPEC.

- Saudi Arabia has been relentless in increasing crude oil production posting four consecutive months of double-digit output growth with June production at 10.35mmbd. While Iraq has exceeded market expectations by pumping out 4.12mmbd. Both countries are pumping at multi-year highs and, combined, have at least another 2mmbd in spare production capacity that it could bring on line in about 90days, if needed.

Million barrels per day (mmbd)	June 2015	1H15	Est. Prod. Capacity	Spare Capacity	June 2014	1H14	June 2015/2014	1H15/1H14
Algeria	1.11	1.11	1.14	0.03	1.12	1.07	-0.9%	3.7%
Angola	1.79	1.77	1.8	0.01	1.68	1.57	6.5%	12.7%
Ecuador	0.54	0.55	0.57	0.03	0.56	0.55	-3.6%	0.0%
Iran	2.8	2.83	3.6	0.80	2.85	2.82	-1.8%	0.4%
Iraq*	4.12	3.70	4	-0.12	3.17	3.33	30.0%	11.1%
Kuwait	2.74	2.78	2.82	0.08	2.78	2.79	-1.4%	-0.4%
Libya	0.42	0.42	0.5	0.08	0.24	0.32	75.0%	31.3%
Nigeria	1.84	1.81	1.92	0.08	1.96	1.93	-6.1%	-6.2%
Qatar	0.66	0.67	0.7	0.04	0.70	0.72	-5.7%	-6.9%
Saudi Arabia	10.35	10.07	12.34	1.99	9.78	9.70	5.8%	3.8%
UAE	2.9	2.86	2.94	0.04	2.72	2.73	6.6%	4.8%
Venezuela	2.44	2.42	2.49	0.05	2.48	2.45	-1.6%	-1.2%
Total OPEC	**31.71**	**30.99**	**34.82**	**3.23**	**30.03**	**29.97**	**5.6%**	**3.4%**

Source: IEA, CMF (HK)

The return of Iranian oil production

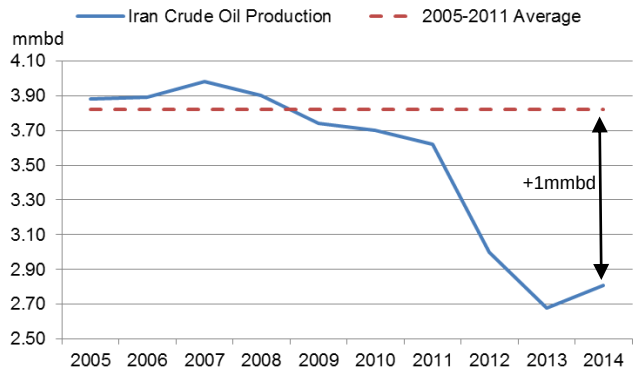
- The agreement to end Iran's nuclear program and lift U.S. and E.U. sanctions could result in a steady increase in Iranian crude oil production that could further exacerbate the current oversupply dilemma within OPEC and cause another round of price reductions as OPEC members fight amongst themselves for market share.

- Prior to United Nations Security Council Resolution 1929, which was passed on 9 June 2010, Iran produced more than 3.7mmbd. Under the new sanctions provided in the resolution, crude oil production entered a steady freefall dropping to the current 2.8mmbd. With sanctions removed, an additional 1mmbd of production should eventually been seen imported into countries such as India and China, who would otherwise buy crude oil from other Mid-East countries, like Saudi Arabia.

- This could spark Saudi Arabia to again reduce its OSP for Asian exports in a fresh wave of price wars with the key difference being that it would be a price war within the cartel, each vying between themselves for market share amidst a slow growing market, rather than a coordinated effort to stop production from a third-party.

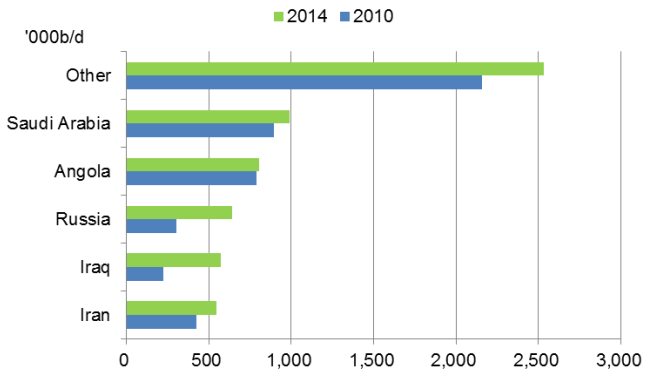
- We estimate that it will take 6-8months for Iran's production to increase back towards 3.7mmbd. But even prior to this increase, Iran with an estimated 40mmbbl of crude oil stored on board tankers could already cause short-term gyrations in the crude market.

Figure 9: Iran could pump out another 1mmbd



Source: IEA, CMF (HK)

Figure 10: China crude import by country 2010 v. 2014



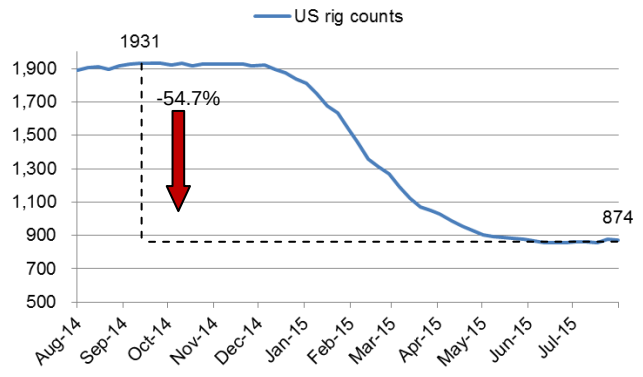
Source: China Customs, CMF (HK)

What are the bright spots?

U.S. crude oil production seems to have peaked

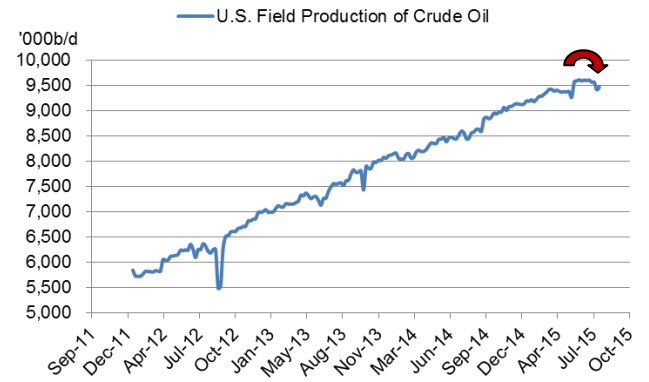
- The plunge in crude oil prices that began last year caused a chain reaction whereby oil companies cut capital expenditure and spending to reduce costs, which meant that drilling rigs across the U.S. were taken out of operation and effectively moth-balled. As a result, U.S. rig counts plunged by more than half from a peak of 1,931 rigs during Sept 2014 to just 874 rigs last week as report by Baker Hughes.
- As the fleet of drilling rigs shrank during 4Q14, the industry estimated that it would take around 6-8 months before seeing a significant reduction in U.S. crude production. However, crude oil production in the U.S. has remained resilient, steadily increasing from 8.83mmbd to 9.4mmbd during the same period despite the decline in active rigs.
- Yet, we may have just seen the inflection point in U.S. domestic production over the past few weeks. Specifically, we believe that the height of U.S. domestic production was seen during the week of 5 June 2015 when the EIA recorded 9.61mmbd of production. Since then, U.S. production has come down (albeit quite choppy) to 9.4mmbd. The 18,125b/d per week drop in production means that we could see a 1mmbd reduction in U.S. crude oil production by July 2016, which would likely boost crude oil prices by 2H16.

Figure 11: U.S. rig count have fallen by >50%



Source: Baker Hughes, CMF (HK)

Figure 12: U.S. crude oil production might have peaked

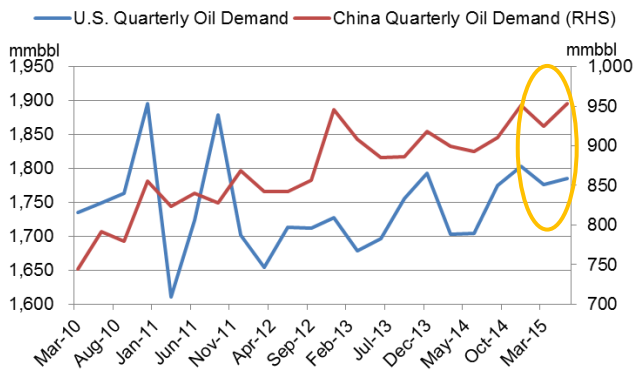


Source: EIA, CMF (HK)

Global demand for crude has been exceptionally strong

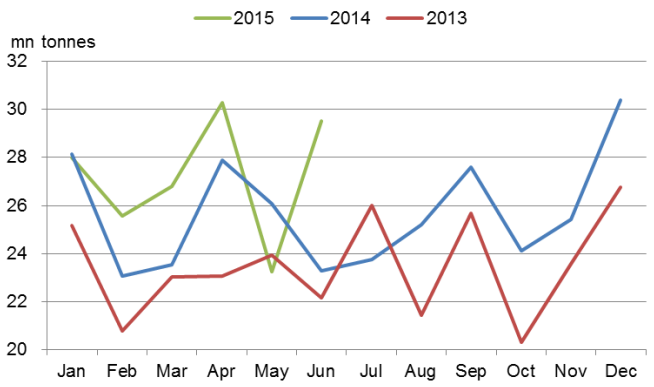
- The drop in global crude oil prices has caused an increase in demand, which has been evident in particularly the U.S. and China, the two largest users of crude oil. U.S. refinery operable utilization reached 96.1% (the highest in almost 10yrs) processing over 17mmbd (the highest on record) during the last week of July. YTD, U.S. refinery inputs have totalled 497mmbbls, up 5.7%YoY.
- Similarly, Chinese refinery inputs have increased 5.1%YoY, with the country processing nearly 10.4mmbd. While at the same time crude oil imports by the country has increased by 7.5%YoY, year-to-date reaching 163.37million tonnes (or approximately 1,192mmbbls).
- Although demand does appear to be on the rise the oil intensity in both countries continue to decline. In other words, less oil is required to produce one dollar of GDP. In that respect, the increase in oil demand could just be a result of a recovering economy in the U.S. and stable economic growth in China. In any event, the use of crude oil is increasing, which would be a longer-term change in the supply-demand equation.

Figure 13: U.S./China quarterly oil demand



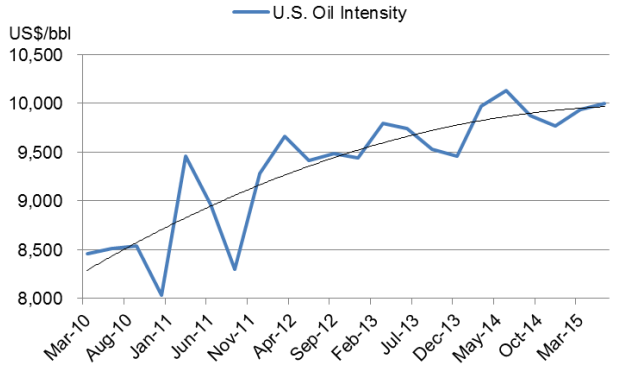
Source: EIA, China C&E, CMF (HK)

Figure 14: China crude oil imports



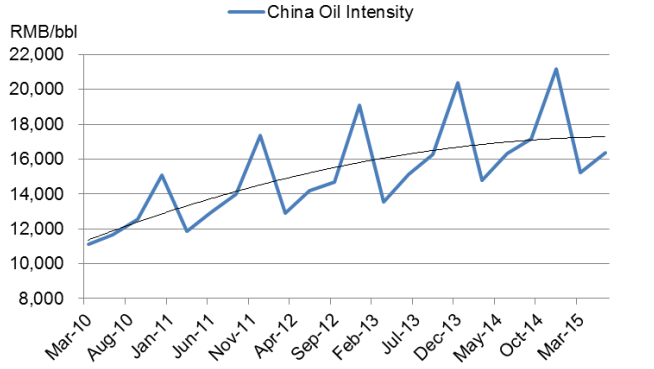
Source: China C&E, CMF (HK)

Figure 15: U.S. oil intensity



Source: Bloomberg, EIA, CMF (HK)

Figure 16: China oil intensity



Source: China Statistics Bureau, China C&E, CMF (HK)

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