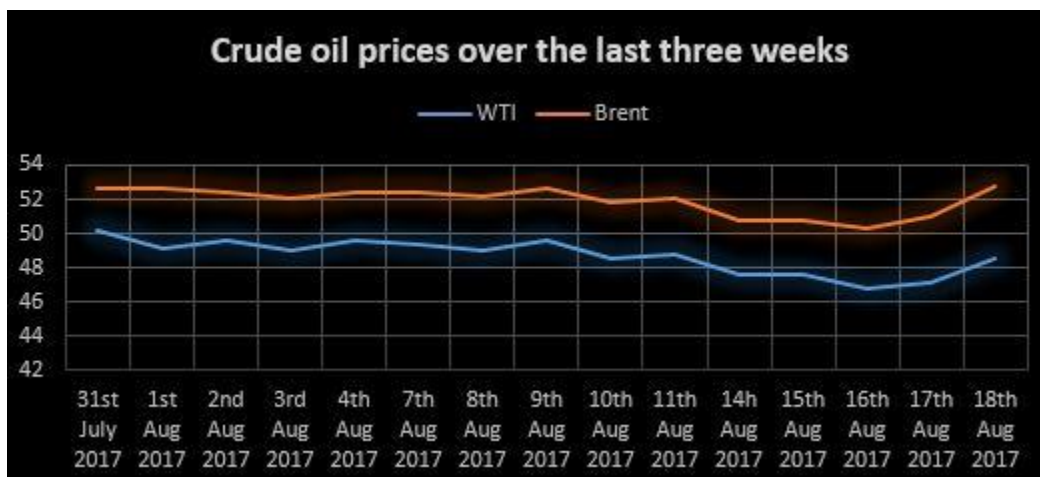
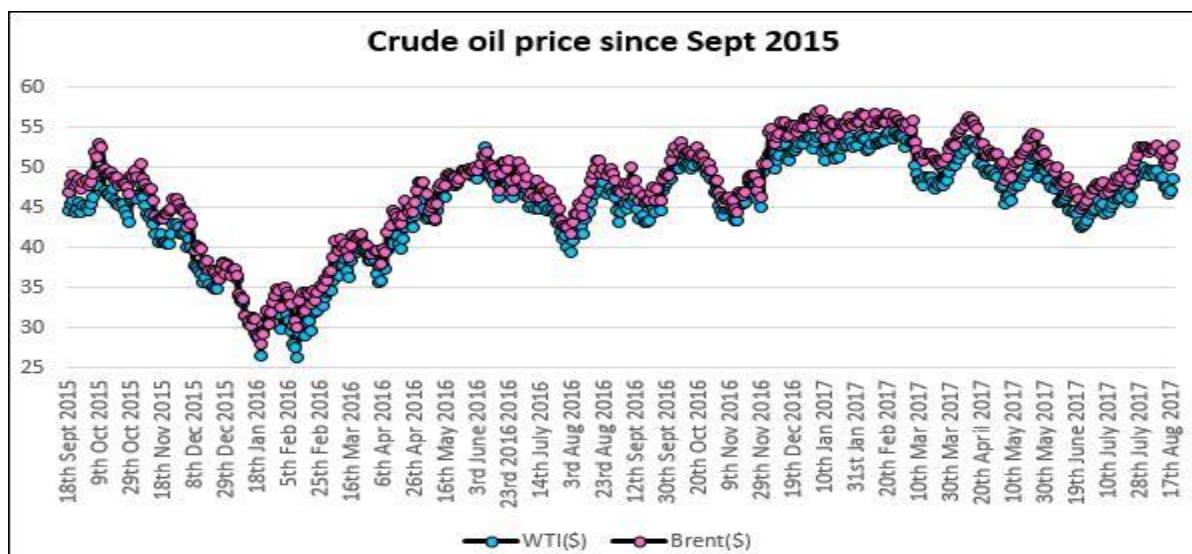


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## Calgary, Canada

As I was travelling last week, this post spans the industry news over the last two weeks.

Some of the news items for this week are as follows:



- In the first week of this month, the number of drilling rigs in the US reduced by 1 (to 765), fueling optimism about a shale slow down. Coupled with OPEC production cuts, this could lead to a reduction in the crude oversupply in the market and makes the prices look up. This optimism resulted in the WTI crude price crossing the \$50 mark. This was despite the US crude output increasing by 20,000 bpd as per the EIA. But this week the crude oil price tumbled as fears that the oil demand would fall. China's oil refining fell the most in three years in July, and the oil output also retreated from the highest this year.
- Earlier this month, the US had slapped sanctions on Venezuelan President Nicolas Maduro and other senior Venezuelan officials for holding elections recently for a new assembly, and rewrite the constitution. Russia has expressed support for the elections. Violence had erupted in

Venezuela ahead of the elections, following which Repsol, Chevron and Total have pulled many foreign workers from their oil fields in Venezuela. This move will be a concern for the Venezuela government, as the country's oil output has been falling over the last few years, and accounts for 95% of the foreign currency revenue. Russia's oil giant Rosneft has now made an advance payment to Venezuelan state company PDVSA for future crude oil supplies. This follows a payment of \$1.02 billion in April, and about \$1.5 billion in 2016. The recent payment could help Venezuela with the debt payment coming up in October, and apparently, the speculation is that the country could end up in a default. Rosneft holds 49.9% stake in PDVSA's US subsidiary, Citgo, as collateral for the \$1.5 billion loan last year. This is also a concern for the US law makers, if Rosneft gains control over Citgo. Venezuela has been in the news over the last couple of years, as it is rocked by political chaos, is short on food and medicine, and internationally has been condemned as an authoritarian state.

- Libya's biggest oilfield Sharara is back got back its production after disruption due to protests. The field is operated as a joint venture between Libya's state producer and Repsol, Total, OMV and Statoil, and has witnessed brief shutdowns caused by different armed groups. In July Libya produced 865,000 barrels of oil per day, and this production has been on the rise in recent months. But this week again there has been another disruption, and details will follow.
- Being OPEC's biggest member and seeking to lead the group by example, Saudi Arabia, as part of its pledge to reduce production, has decided to reduce crude sales to some of its buyers in Asia for September 2017. Saudi Arabia will make a total reduction of 1 mb across south and southeast Asia. Rising production in Libya and Nigeria as well as lower compliance to promised curbs by some OPEC nations has prompted Saudi Arabia to act. The kingdom is also planning to increase pressure on nations that have not complied with their pledged cuts. Meanwhile, as per OPEC, Iraq, UAE and Kazakhstan – the countries that have lagged in their implementation of production cuts – have affirmed their commitment to follow through.
- The US EIA in its latest Energy Outlook has released some interesting figures. The domestic output average will be 9.91 mb/d next year (up from 9.9 mb/d estimate in July). The WTI crude price has been lowered to \$48.88 from \$48.95. The domestic production is 9.35 mb/d (up from 9.33 in July), and the global production is seen at 100.21 mb/d next year (which is up from 100.2 mb/d in July). As per the EIA, the EIA exports of LNG will increase and by 2020 its export capacity will be third-largest in the world, after Australia and Qatar. At present the US is the biggest natural gas producer in the world, surpassing Russia in 2009. The US natural gas production rose from 55 bcf in 2008 to 72.5 bcf in 2016, and much of this gas is consumed domestically. In recent months, the US has started exporting gas.
- Many energy analysts, including Goldman Sachs Group, have said from the beginning that OPEC decision to reduce global glut is working will have one indicator, which is when discount on immediate crude would turn into premium. This was noticed last week when the front-month Brent crude was more expensive than the second-month for a second day. Thus, some rebalancing of the market might be happening, and there is optimism that OPEC effort will work. Despite moving in the right direction, and these visible signs, it could take a long time for the market to rebalance; definitely it is not happening this year.
- The decision by OPEC to cut production by 1.8 mb/d has led to an effect on tanker demand. This has been supplemented by the seasonal dip in terms of refinery buying of crude. There has been

an oversupply of tankers, but this situation is changing with the US shale oil exports going to China. So far US exports have averaged 760,000 b/d. Also, tankers bound for China typically sail around South Africa, which is a voyage close to 18,000 miles and so the freights are more, being charged by the ton-mile method.

- Crude oil price dropped after a forecast on US shale growth that has again threatened the market balancing. Per the recent EIA report, production from shale fields is forecast to expand by 6.15 mb/d in September.

So much for the industry news this week.

### *For the lighter side this week*

Instead of a column deviating from the technical content, this week I am writing about something that has caught my attention recently, and is indeed technical in nature.

An interesting research news that I came across is that hydraulic fracturing done to enhance permeability in shale formations recovers about 7% of the oil in the reservoir, per the US EERC (Energy and Environmental Research Centre). Even with large lateral horizontal wells, the decline curves for such tight formations are steeper. Thus, vast amounts of oil are left in the ground. For US reserves, this figure has been estimated by NETL (National Energy Technology Laboratory) at 400 billion barrels. Tight rock formations are not conducive to waterflood type of enhanced oil recovery (EOR), due to their poor permeability, a conclusion reached by various studies and industry experts. Efforts have been devoted by EOG Resources to CO<sub>2</sub> EOR in Eagle Ford Shale, and several companies and government agencies are making investments in research for EOR in the Bakken.

A pilot study was initiated by EERC in 2012 to study the CO<sub>2</sub> EOR in the Bakken. The preliminary phase, completed in 2012, was to use reservoir characterization data and laboratory data such as core analysis, well logs and oil analysis. The results were very encouraging for using CO<sub>2</sub> EOR recovery of hydrocarbons from Bakken reservoir rocks and from Bakken shales. The second phase initiated recently by EERC, involves applying the learning of the preliminary phase and perform field tests in the Bakken. In late June, this year, EERC in partnership with XTO Energy initiated a field test on an unstimulated vertical well in the Bakken over a period of 2 weeks. The data will be analyzed and reported later this year.

EOG Resources began working on EOR in the Eagle Ford Shale three years ago, and has achieved production and economic success on four pilots involving 15 wells. Another pilot study involving 32 wells was completed in 2016 in the Eagle Ford. Now the company is implementing an EOR on another 100 wells. Based on these studies EOG Resources will be able to conclusively estimate resource production attributable to CO<sub>2</sub> EOR.

Even though such efforts at EOR in unconventional shale formations are in their infancy, more sincere and focused efforts must be devoted toward this problem. The results that have trickled in so far are encouraging, and the potential is huge. This may provide the incentive for investment to various industry and government organizations. The present low price environment has been playing the spoil sport.

### *Did you know?*

..... that honey bees are in danger of extinction? Yes, this news has been doing the rounds for years now. In 2007, many beekeepers noticed that the population of honey bees is collapsing, and in some cases many bee colonies got wiped out.

Honey bees are excellent pollinators for many of our food crops, and we depend on them heavily. More on this issue another time.

I hope you find these interesting.

So much for this week! Till the next post, stay safe and happy!