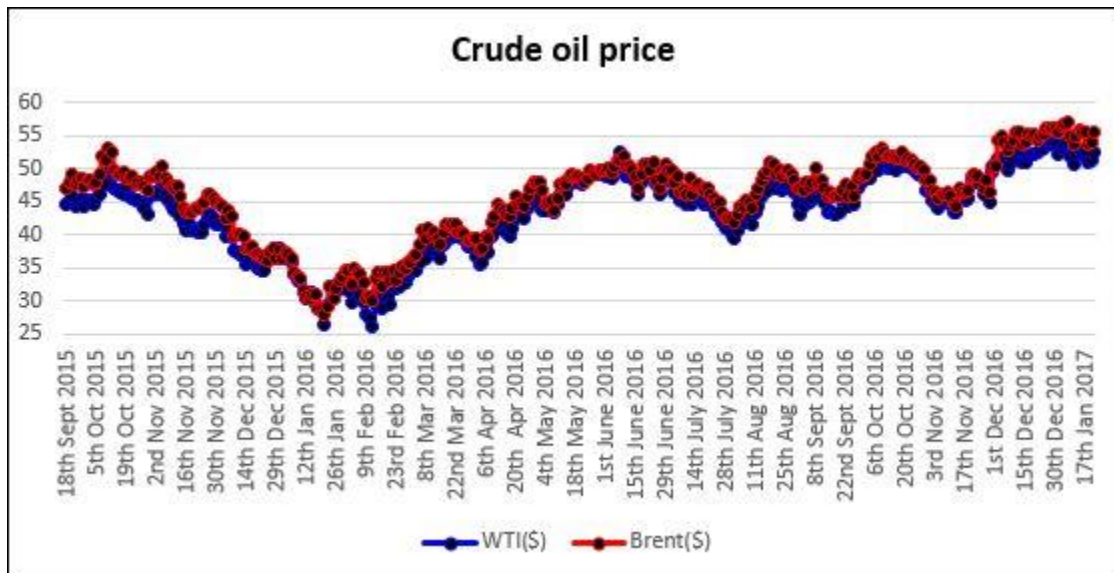


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Some of the news items for this week are as follows:



- The price of oil fluctuated this week for a couple of reasons. Earlier in the week traders were looking for some kind of proof that OPEC and other producers would follow through on their promises to reduce their production. This saw the price of the barrel decline. Midweek, the Executive Director, Fatih Birol, also said that higher oil prices will prompt a 'significant' increase in the US shale output, which again saw the price decline. Later in the week the price recovered as industry data showed that US crude stockpiles declined by 5.04 mb last week. Some indications were also received that producers from Saudi Arabia to Iraq are implementing the reductions.
- A 5-nation compliance committee from OPEC and non-OPEC members is scheduled to meet on January 22<sup>nd</sup> at Vienna to verify if compliance to the promised production cuts is indeed happening.
- Some of the top industry officials have met in Davos, Switzerland this week. Mixed messages came out from there. Yes, the crude prices will go up, and this will prompt the US shale production to go up as well. This will put downward pressure on prices as well, may not be immediately, but in the second half of the year, even though shale drillers are three times more productive that they were in 2013. Also, what are being tapped at present in North America are the most prolific wells. With increase in demand, the production will go to other wells and areas where the wells may not be so productive and will need higher prices. For example, the breakeven price in the Permian Basin in \$40, but in other areas it is higher.
- OPEC's monthly report is scheduled to be released on February 13<sup>th</sup>, which will report the overall production in January 2017 and give a better picture. In an interview recently, the OPEC Secretary General said that OPEC and non-OPEC producers will meet in Vienna in May 2017 to assess the

market and decide if the agreement to curb production needs to be extended. The US rig count increased in 10 of the past 11 weeks, according to Baker Hughes data.

- According to EIA, for the week ended January 6<sup>th</sup>, the US crude oil output rose to the highest level since April, and it is expected to grow by 110,000 b/d this year.
- Libya, which is exempt from the OPEC agreement increased its production to 700,000 b/d as power outages at its fields were restored.
- China's domestic crude oil production is expected to decline by 7% this year after a record decline in 2016, and its increasing demand will thus help reduce the global supply.

So much for the industry news this week.

### *For the lighter side this week*

In passing in front of a magazine shop the other day, I read a headline on a recent issue of the 'Scientific American', that said 'Lab grown brains'. This caught my attention, and I got curious to find out the details. Hereunder is what I was able to find.

The human brain is a complex 'thinking' machine or an organic computer. But it is fascinating to learn that efforts are being made to learn more about them. Our brain is made of millions and millions of brain cells called neurons, with complex structures that are interconnected through synapses or junctions between two nerve cells.

To understand the structure of these neurons and their development in detail, scientists have started 'growing' them in the labs. One such effort has been made by Madeline Lancaster at Cambridge University. She uses stem cells cultivated from skin samples, and then immerses them in nutrients and vitamins for their development into neurons. The neurons are then planted in a dense protein gel, placed in a petri dish, where they replicate, grow and represent a miniature version of the human brain. It is called miniature as it does not perform all the functions of a human brain, but forms part of the nervous system, and so probably represents the beginning of our understanding on how living brain tissue grows, and how the neurons form clusters and expand, and finally what prompts neural growth.

Check out the following links to see Lancaster's interview and some other relevant stuff:

<https://www.youtube.com/watch?v=sH9KCHiuu8E>

<https://www.youtube.com/watch?v=EjiWRINEatQ>

<https://www.youtube.com/watch?v=X7CoDdOvVX0>

There are close to twenty different labs around the world spread out in Brazil, US, Europe, Japan, and other countries, that are working on such neuron growth studies. One big limitation at present is that neurons in the human brain are connected through blood vessels that supply the nutrients required for their growth. The immersion of the stem cells in nutrients is not the same as their constant supply through the blood vessels. Such 'petri dish brains' have survived for a year or so, but some breakthrough is required here.

Early similar experiments were conducted on animals, but the human brain is so different. Though these experiments helped get an initial understanding, but the experiments being undertaken will allow researchers study the human brain in unprecedented detail.

Such 'petridish minibrains', comprising functioning nerve cells and fibres, are expected to be valuable research tools for testing if new drugs and for investigating brain disorders such as Alzheimer's.

The stem cells I mentioned above are a class of undifferentiated cells that are able to differentiate into specialized cell types during their life and growth. These cells can renew themselves through cell division even after long periods of inactivity. They can serve as an internal repair system in many tissues. Stem cells are found in tissues such as the brain, bone marrow, blood vessels, skin, liver, etc.

I hope you will find this interesting.

*Did you know?*

In continuation of the question I asked in my last post, I pose this question: *Why do penguins live in the South Pole and not the North Pole?*

The answer is similar to what I said before. The Arctic area is a frozen mass of water, whereas the South Pole is a continent with masses of snow and ice deposited on land. Besides, Antarctica is surrounded by sea water, leaving no way for land mammals to reach there. Penguins swam their way to Antarctica to set up their colonies there. As there are no predators on Antarctica, penguins are safe in this respect as well. Besides penguins, seals are also found on Antarctica. Both penguins and seals are found living in the water surrounding the Antarctica continent and come on land occasionally, and not at the South Pole in the center of the continent, where it is excessively cold.

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

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