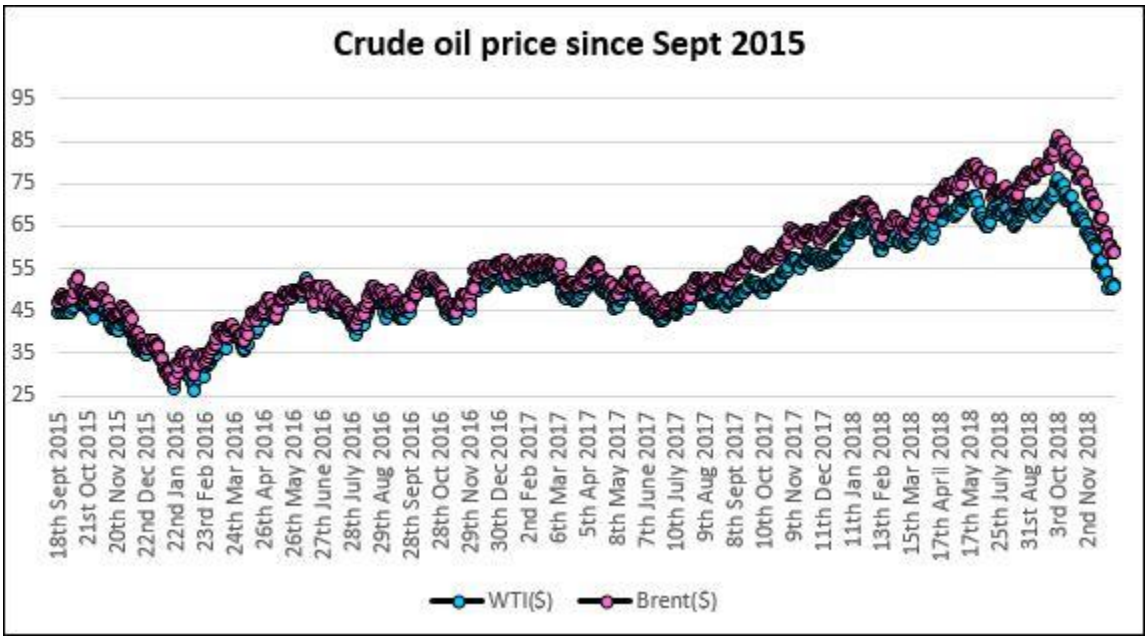

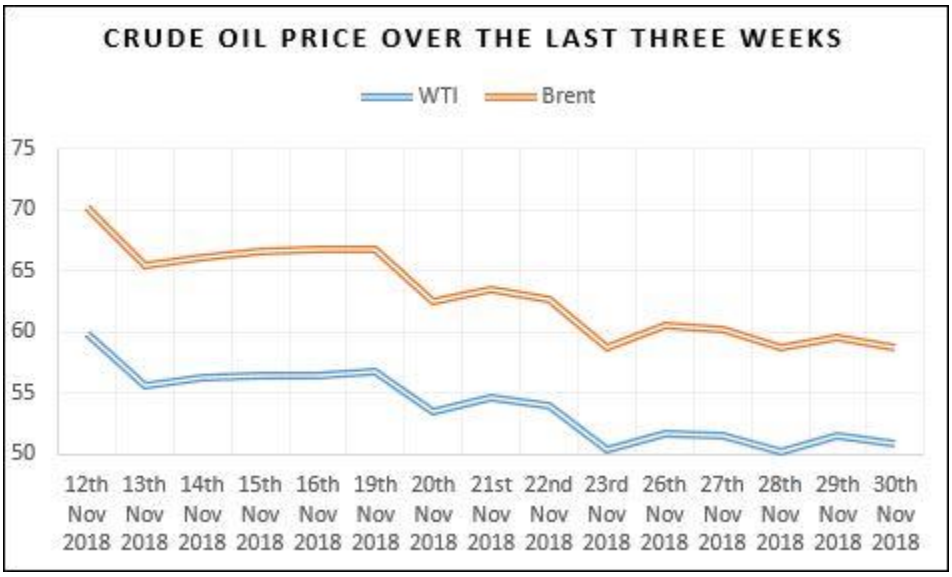

- The opening up of production by Saudi Arabia and Russia over the recent weeks, the US shale drillers pushing their production higher and higher and waivers granted by the US administration to buyers of Iranian crude are some factors that resulted in more oil in the market, and the consequent slump in the price of the barrel. The crude price rose to $51 on Thursday this week only to slump below again. President Putin indicated that Russia is ready to cooperate with OPEC, which was taken as Russia being agreeable for production cuts, should OPEC decide to do so. Adding fuel to fire, last week the US stockpiles rose by 3.58 mb.

The crude oil price is hovering above $50 a barrel now, which is the price at which many of the large shale explorers had set their budgets for 2018. Some small producers had planned for some 10 to 15% higher than this. The slump in the price of the barrel at this time will restrict the free cash flow in many companies over the next few months. With prices at $65 and $70 a barrel, many of the companies had a lot of cash flow, which will dry up with the price at $50. Not only that, the shale explorers will likely cut their spending budgets next year or reprioritize their activity.

All eyes will be on the G20 Summit in Buenos Aires, Argentina this week, where the decision makers will be meeting ahead of the OPEC meeting on December 6 in Vienna. Over the next week some decisions will be taken, and the price of the barrel will be affected accordingly.

- An interesting and far-reaching development is that Exxon Mobil Corp., under pressure from its investors, has decided to use renewable energy for producing oil in West Texas. It has signed an agreement with the Danish company, Orsted A/s to buy 500 MW of wind and solar power in the Permian Basin, the largest producing US oil field. Talking of power consumption, the western part of the Permian, called the Delaware Basin, consumed the equivalent of 350 MW this summer, which was three times its consumption in 2015, and is likely to triple again in 2002. This is enough power for 280,000 US homes. As the oil and gas companies are becoming conscious of the risks of global warming, they are turning to the use of clean energy, especially as it is becoming cheaper and is competing with the fossil fuels. The areas where oil and gas production are growing and resulting in soaring demand for electricity, wind and solar farms are now being set up in those areas. Texas is the state with the most wind power (>23 GW), and is also the fifth-largest solar market (~2.6GW).

So much for the industry news this week.

For the lighter side this week

A recent news item drew my attention and so thought of sharing with you. An aeronautics professor at MIT, Steven Barrett has published (as lead author) a study in the journal Nature, about a 'solid state' airplane with no moving parts in its propulsion system. That is, the plane has no propellers or turbines in its flight. So how does it fly? The flight uses ionic wind technology. A powerful electric field is used to generate charged nitrogen ions, which are expelled from the rear of the plane, and generate the thrust. In their prototype plane, the 'wires at the leading edge of the wings have 600 watts of electrical power pumped through them at 40,000 volts'. Such a high voltage induces 'electron cascades' that charge the air molecules near the wire. These charged air molecules get accelerated as they flow through the electrical field towards a second wire at the back of the wing, striking into neutral air molecules, and imparting energy to them. These neutral air molecules stream out at the back of the plane and provide it the required thrust. Interestingly, the thrust-to-power ratio is comparable to that achieved in a conventional jet engine.

The professor sought inspiration from his early childhood viewing of the famous TV serial Star Trak, where planes are shown flying silently. So, he started wondering about the physics behind making such a flight possible, and came across the idea of ionic wind, which was first investigated in the 1920s. The idea didn't make much progress at the time but was again revisited in the 1950s. At the time researchers concluded that it could not work for making airplanes fly.

Steven Barrett started working with some of his graduate students to understand the fundamentals of ionic wind technology and how that could be optimized for putting a plane in the air.

This electric propulsion technology holds the promise of making the future aircrafts to be more efficient and non-polluting. The test was carried out with a plane weighing 2.45 kg, that had a wind span of 5m, a battery converter and was able to fly a distance of 60 meters.

The MIT team plans to increase the range and speed of the plane as well as scaling up its size. Some direct applications in the short term could be unmanned drones and high-altitude solar-powered flights. The drones could be miniaturized as they will not need the rotors to fly.

When this idea takes off in a practical way in terms of passenger flights, it will open up the possibility of carbon-neutral flights and lower the emissions produced by the aviation industry globally.

I hope you find these interesting.
So much for this week! Till the next post, stay safe and happy!