Tom Whipple, Editor

ASPO USA PEAK OIL REVIEW

Association for the Study of Peak Oil & Gas USA

October 28, 2013

Contents

1. Oil and the Global Economy

The decline in oil prices which began in early September continued last week with NY oil falling as low as $96 a barrel on Thursday, down by $10 from recent highs, then rising to settle at $97.85 on Friday. London's Brent crude fell about $3 a barrel last week to close at $106.93 leaving the WTI/Brent spread at $9.08, down considerably from the $11.67 it reached on October 22nd. Behind the continuing price declines was the perception of lower tensions in most of the Middle East; increasing US crude production, which is now at the highest rate since 1989; growing US crude stocks; and weaker demand. The only bright spot for oil prices last week was in China where manufacturing increased and September oil imports rebounded 21 percent from an unusually low level in August.

The end of the federal government shutdown led to the issuance of two US stocks reports both of which showed lower rates of refining and large increases in crude stocks. Traders are concerned, however, that the shutdown will delay the Census Bureau's monthly report on trade data which the EIA uses to calculate the exports of oil products. Even though newly released data is two months old, it is vital to drawing a complete picture of the oil markets.

Rising global demand for diesel fuel, which mostly comes from crude, not NGLs and ethanol, has resulted in record diesel exports from the US. This in turn has resulted in higher refining levels than warranted by domestic US consumption and production of gasoline beyond what is needed. The build in gasoline stocks has resulted in the sharp decline in US gasoline prices we have seen in recent weeks. The EIA has been reporting lately that US exports of refined products were at a record 3.3 million b/d, 23 percent higher that last year -- but that figure was based on three-month old data and is unlikely to still be accurate.

Last week the EIA released the first edition of its new publication, the *Drilling Productivity Report*, which looks at production from the six major tight ("shale") oil and gas plays that currently are producing record amounts of oil and gas. The report is somewhat bizarre in that it only forecasts a month ahead (i.e. monthly production in November 2013) rather than attempting to deal with the important question of when production from these plays will peak and start to decline.

The report shows that production from what it terms "legacy" wells (those that were in production before the current month) in the Bakken and Eagle Ford plays are now declining by 140,000 b/d each month. This decline is forecast to be offset by production from new wells that come into production during November of 191,000 b/d so that by the first of December these two fields are supposed to be 51,000 b/d more than in November. When the other four US oil and gas fields considered by the EIA are added in, US production is projected to increase by some 60,000 b/d from October to November.

A rather misleading feature of the report is that it shows production from newly drilled rigs increasing from 200 to 500 barrels per day during the last two years. This, of course, seems strange as the more productive sweet spots are usually drilled first so that newer wells are usually less productive. The trick here is that oil rigs are now drilling multiple wells per site so that even though the production from individual wells may be dropping, production per rig, from fewer rigs, can be shown as increasing each month. While there are efficiencies for drillers when they drill multiple wells from each drilling site, these are still very expensive wells to drill and frack so that the production from the newly drilled wells is likely declining and the cost per barrel is increasing.

The glaring weakness in the report is its failure to even note the steep decline in production from "legacy" wells. As more and more wells are drilled, this number will continue to grow until it surpasses the industry's ability to increase production each month. This situation is what is known as "peak oil" and it does not look very far away for the Bakken and Eagle Ford fields.

Natural gas futures turned higher late last week as colder weather settled in across much of the northern US, offsetting a larger-than-expected increase of injections into storage. Milder weather is currently forecast for November, however.

2. The Middle East & North Africa

As the situation deteriorates in much of the region, criticism of US policy in the Middle East is increasing from traditional US allies such as Israel and the Saudis. The Israelis naturally are concerned that the current nuclear negotiations with Tehran will result in the end of the sanctions with few real restrictions on the Iranians' ability to produce nuclear weapons. The Saudis have multiple grievances with the US ranging from Washington's failure to launch air strikes against Syria last September to the failure to support the Mubarak government in Egypt to the nuclear negotiations with Tehran. Some are also unhappy that the US has done little to rebuild Libya in the last two years – letting it slide into anarchy.

In reality, there is little the US can do about the Syrian, Egyptian, and Libyan situations. Neither the Israelis nor the Saudis have much leverage with Washington other than appealing to friends in Congress to pressure the administration.

Iran: With the new round of nuclear arms negotiations going well, the new government seems to have come to the realization that a foreign policy based on chanting "Death to America," at every opportunity and toying with the world regarding acquisition of nuclear weapons is not getting them anywhere. While the new government may realize this, there are important segments of Iran's leadership who cling to the old ways and see a threat to their positions in the changes sweeping the region.

Last week a senior Iranian parliamentarian said that Tehran has halted 20 percent enrichment of uranium, but this was later contradicted by another senior parliamentarian showing the discord over the nuclear negotiations that is current in Tehran. Tel Aviv naturally sees the negotiations as a ploy to get the sanctions lifted and continues to demand that the Iranians close all uranium enrichment facilities – an unlikely occurrence.

The Iranians are clearly anticipating the end to the sanctions soon as they are sending out feelers to their oil customers as to how much they would like to buy after the sanctions are lifted. Beijing seems to have found a partial way around the sanctions by importing large amounts of refined heavy fuel oil which is not covered by the sanctions, but can be turned into other oil products by China's "teapot" small private refineries. The South Koreans are also stepping up oil imports from Iran. Nuclear negotiations between Tehran and the world powers resume next month.

Libya: The CEO of Italy's ENI, which is the largest foreign oil producer, says his company is very worried about the deteriorating situation in the country where a combination of strikes, militia demands, and activists

seeking to break up the country have disrupted oil production since July. The US's Marathon oil is seeking to sell its assets and pull out of the country despite Libyan government objections. This state oil company announced last week that production has been stable recently at about 600,000 b/d down from 1.1 million b/d in the spring.

Syria: As the civil war drags on the situation for the five million Syrian refugees still trapped in their own country is becoming increasingly desperate. While life is miserable for the 2 million who have fled to Turkey, Jordan, Lebanon, and Iraq, in most cases they have shelter, food, and access to relief organizations who can provide medicines and other needs. For those trapped in neighborhoods where fighting is taking place or are blockaded by government forces trying to starve out insurgent forces, the situation is becoming increasingly desperate. Even the relatively safe areas in Syria are being subjected to influxes of refugees and a nearly non-existent economy. Schools, hospitals and jobs are disappearing.

The number of government bakeries is shrinking and people are being reduced to eating dogs and cats. In many areas government forces are banning relief agency access to the starving. The UN is not collecting nearly enough money to feed the millions who are going hungry. The World Food Program says it is already feeding some three million, but is unable to reach an additional two million more. All this points to a major humanitarian crisis shaping up this winter. Reports of people succumbing to malnutrition and cold are already starting to filter in and the situation will only get worse.

Iraq: As usual, the bombings continue with ten car bombs going off in Baghdad on Sunday killing 41 and wounding more than 100. Other bombings earlier in the week added to the death toll which could end up on the order of 8 or 9,000 by the end of the year. A US-Canadian academic study released last week concludes that some 500,000 Iraqis have died violently since the US-led invasion in 2003. Prime Minister Maliki warned last week that the country is facing a "war of genocide" as Shiite militia prepare to retaliate to what so far has been a largely one-sided affair with Sunnis, led by al-Qaeda, carrying out most of the bombings.

In the meantime, officials in Baghdad remain optimistic that oil production will increase from the current 3.3 million b/d to 3.5 million by the end of the year and will increase further next year as new production comes on line and work on new export terminal facilities is completed.

The current goal of Sunni extremists is to take over the western Anbar province which borders on Syria and gives nearly unlimited access to arms and supporters from Syria. For now most of the attacks are against security bases and soft civilian targets, but as the violence steps-up it is likely to be increasingly directed against oil facilities in an effort to choke off government revenue.

3. China

Beijing announced last week that the up-coming Central Committee will explore "deep and comprehensive" economic reforms. The announcement comes at a time when many are pondering what happens next to China's economy which has been growing at unprecedented rates for the last 35 years and is reaching a turning point. Many believe that China will have to abandon its model of growth based on exports and debt-financed infrastructure to a more sustainable consumer-oriented model.

Last week there was graphic demonstration of what 50 years of ignoring pollution will eventually do to an economy which is based on burning massive amounts of coal, when much of northeastern China ground to a halt amidst clouds of thick deadly smog. It is clear that China must move quickly to cut coal consumption and many other forms of emissions or its people will die prematurely by the millions and foreigners will be reluctant to live or even visit there. For now Beijing is taking small steps to deal with the situation by forecasting and curtailing emissions during vulnerable weather conditions, but over the long run this will be insufficient and untold billions will have to be spent on curtailing emissions.

In short run we are likely to see major increases in natural gas consumption which will come from Russia, Central Asia, and imported in the form of LNG. Whether the steady growth in oil imports of circa 500,000 b/d each year will continue at the current pace remains to be seen. For now, however, China's economic growth is one of the major sources of increasing world demand for oil.

China's manufacturing hit a seven-month high in October which is in line with the rebound in 3rd quarter GDP growth to 7.8 percent from 7.5 percent in the 2nd quarter.

4. Brazil

It is six years since Brazil first announced the discovery of massive amounts of oil in the ultra-deep pre-salt layer off its coast. Many are counting on oil from the tens of billions of barrels thought to be under the salt as powering the world in coming decades. Until recently, euphoria in Brazil was high and the country hoped to become a major energy power in the class with the Saudis. The problem, however, is that ultra-deep oil is difficult and expensive to extract and sizeable foreign investment will be necessary to drill and exploit the pre-salt fields. To ensure control and maximize profits, Brazil drew up elaborate regulations for exploiting the oil which required that its national oil company, Petrobras, have at least a 30 percent stake in any project and be the primary operator. Between 37 and 55 percent of the materials used in exploiting the oil would have to be purchased in Brazil and there would be $7 billion upfront payment due to Brazil when the lease was signed.

Last week Brasilia held an auction for drilling rights in its Libra field, which is thought to contain from 8 to 12 billion barrels of recoverable reserves, and hardly anybody came. The rather onerous and risky terms required by the government resulted in only 11 participants in the "bidding" as opposed to 71 in the last auction. At the end there was only one bid and it was at the legally imposed minimum of 41.6 percent of the profits going to the government. In the only consortium to be formed, Petrobras had to take a 40 percent share with the remainder divided equally among Shell, Total, and two Chinese firms. The auction can hardly be termed a success.

Large scale production from the pre-salt fields cannot be considered a sure thing. Conditions are extremely difficult and recent experience with deep-water oil extraction in the Gulf shows that these fields may not turn out to be as productive as was once hoped. Dreams that one day soon Brazil will be producing large quantities of oil for export seems to be fading.

5. Quote of the Week

- "The essential point is that the economy is not a monetary system governed by the theoretical 'laws' of economics, but an energy dynamic determined by the all-too-real laws of thermodynamics. Once we understand this, the squeeze on household prosperity becomes far less of a mystery."

  -- *Tim Morgan, Tullett Prebon's former global head of research, author of* Life After Growth

6. The Briefs

- **Chinese oil companies** have been on a global shopping spree—especially in the rejuvenated North American oil industry. Since 2008, the companies have spent $44.2 billion to acquire US and Canadian energy firms as well as oil and gas fields. That is more than these large, state-owned Chinese companies spent in Africa, Latin America, Europe or any other part of the world. (10/26 #13)
- **Russia and China**'s largest energy companies announced a "breakthrough" deal paving the way for joint development of massive energy reserves in eastern Siberia, in a sign that Moscow is overcoming its fear of Chinese encroachment on Russia's Far East. (10/21 #20)
- **India** will spend $2.2 billion to more than triple its proposed emergency crude oil reserves as it seeks to protect the economy against supply disruptions. (10/24 #19)

- **OPEC** sees a possible drop in energy demand caused by a weaker world economy as its "main area of concern" for the next several months. (10/22 #5)
- **In Iraq,** despite having the world's third-largest conventional oil reserves, and with the lowest cost of oil field development in the world at around $2 a barrel, production has been uneven at best, as the oil sector has suffered from war, sanctions, mismanagement and red tape. Now, however, as Iraq continues to celebrate ongoing oil production increases, the world is watching closely. (10/24 #11)
- **Saudi Aramco** has let a contract for design of a 300,000 b/d expansion of production capacity at the Khurais complex of oil fields. Current capacity is 1.2 million b/d of crude from Khurais, Abu Jifan, and Mazalij fields, which began production in 2009. (10/22 #10)
- **In Kurdistan**, the consortium managing the only producing natural gas field in Iraq's autonomous region is taking the Kurdistan Regional Government to court, alleging overdue payments that are likely to total over $2 billion. The dispute threatens to send an uncharacteristically chilling signal to foreign companies that have generally lauded the KRG's Ministry of Natural Resources for creating a welcoming climate for investors. (10/22 #8)
- Austrian energy company OMV said Monday an oil discovery in **Libya**, made with partners Repsol and Total, is its first since the country's 2011 revolution. Repsol will continue with the exploratory campaign, which began in 2013 and which will continue through the end of 2015. (10/22 #9)
- The consortium developing Kazakhstan's giant **Kashagan oilfield** said it needs a few weeks to resume production cut by an industrial accident on Oct. 9. (10/25 #12)
- Adventurous oilmen are starting to gravitate toward **Ethiopia,** where drilling activity has been sparse since rebels attacked an exploration team in 2007, killing 74. Oilmen believe Ethiopia lies on the same oil-bearing strata as the massive discovery in Kenya by Tullow Oil in early 2012. Initial estimates are that Ethiopia has oil reserves of around 2.7 billion barrels.. (10/26 #11)
- **Pirates** attacked an American-flagged oil industry vessel off the Nigerian coast early Thursday and abducted the captain and the chief engineer. The abductions appeared to be the first involving American hostages in that region in at least two years. (10/25 #13)
- In **Argentina**, crews are drilling around the clock in pursuit of a vast shale oil reservoir—Vaca Muerta—that might be the world’s next great oil field. Protests against hydraulic fracturing, however, have grown so fierce that the police have cracked down on thousands of demonstrators with tear gas and rubber bullets. The US EIA ranks Argentina fourth behind Russia, the US and China with technically recoverable shale oil reserves of 27 billion barrels. (10/22 #13)
- Two of the companies drilling for oil in the **Falkland Islands**' South Atlantic waters are merging. Falkland Oil and Gas Ltd and Desire Petroleum agreed to the merger to eliminate duplication and make their search more cost-effective. (10/25 #14)
- **Alberta's** environment ministry has ordered Canadian Natural Resources to speed its efforts to stop the spread of oil leaks that have likely contaminated groundwater near a large-scale oil-sands project. (10/24 #20)
- **Critics of the Keystone XL pipeline** say they're still optimistic President Barack Obama will block TransCanada Corp’s planned $5.3 billion link between the oil sands in Alberta and refineries along the US Gulf Coast. Just to be sure, they're organizing a nationwide civil-disobedience campaign to keep up the pressure should the US State Department recommend Obama approve the project. (10/23 #22)
- **BP projects annual capital spending** over the next several years to be $24 billion to $27 billion—at least 25% higher than 2011 levels as the company pours cash into projects in Angola, Azerbaijan, Indonesia, and elsewhere. Company executives say the spending is part of an effort to recover from the 2010 Deepwater Horizon explosion and oil spill. (10/25 #28)
- Canadian Pacific has transported **65,000 carloads** of crude oil, or approximately 45 million barrels of oil, so far this year. The company expects to reach 90,000 carloads of crude oil by year's end. Crude deliveries by rail are increasing in North America because production has outpaced existing pipeline capacity. (10/25 #26)

- **Net energy of SAG-D:** A University of Calgary team has assessed the thermal efficiencies, energy balances, and emissions of Steam-Assisted Gravity Drainage (SAGD) for the production of bitumen from Athabasca oil sands reservoirs. The costs can be large given the amount of steam required. The data suggests that at the extreme, some operations are actually not net energy generating—i.e., the energy injected via steam exceeds the recovered chemical energy in the retrieved bitumen. (10/21 #18)
- Risks are mounting of an **oil price bust** as analysts including Marshall Adkins of Raymond James & Associates forecast crude is heading down to $70 a barrel next year, a price that would slow drilling in the Permian Basin, the most expensive-to-drill US shale formation where varied geology makes it more costly to explore and develop. If oil drops to $80, some wells in the Permian will become money losers. (10/25 #21)
- **Rigs** targeting oil and natural gas in the US declined by one this week to 1,738, according to Baker Hughes . (10/16 #16)
- To date, **60,000 unconventional oil and gas wells** have been drilled in the US, but 500,000 drilling locations remain, meaning the industry has drilled a little more than 20 percent of possible sites, given current spacing and conditions. Estimates of the amount of capital needed to drill and develop range from $2 trillion to $5 trillion, but the market capital of shale participants is less than $1 trillion. (10/22 #29)
- The EIA said in a recent report **US crude oil production** should increase from the expected 2013 average of 7.5 million barrels per day to 8.5 million bpd in 2014. (10/26 #15)
- **In the US shale oil race**, the Eagle Ford formation in Texas has beaten North Dakota's Bakken to the 1 million b/d milestone. Total production from Eagle Ford hit 1 million b/d in August. The Bakken is expected to produce 960,000 bpd in November. The Bakken is the more mature of the two, with drilling taking place since 2003. The Eagle Ford, which initially was seen as a natural gas play, did not have notable oil drilling until early 2009. (10/24 #21)
- Wild claims about the **Spraberry Wolfcamp oilfield** made by Pioneer Natural Resources continue to circulate. They estimated it holds 50 billion barrels of oil in place, making it the world's second-largest oil field after Saudi Arabia's Ghawar, and dwarfing South Texas's Eagle Ford (27 billion original oil in place) and North Dakota's Bakken (13 billion). A key difference: Sprayberry Wolfcamp's shale is 3,500-4,000 feet deep while the Eagle Ford formation is just 300 ft deep. (10/24 #23)
- At least **15.3 million Americans** live within a mile of a well that has been drilled since 2000, according to an analysis by *The Wall Street Journal* of well location and census data for more than 700 counties in 11 major energy-producing states. (10/26 #14)
- **US exports of natural gas liquids**, already at a record amid increasing output from shale deposits, are poised to quadruple by 2020 as the expansion of the Panama Canal cuts shipping costs to Asia. Deliveries of the fuels to foreign buyers averaged 555,000 barrels a day in July. (10/22 #26)
- **Smaller nations** planning to invest in natural gas should proceed with caution, according to interim results of a study by the MIT Energy Initiative. Because the cost to develop natural gas for smaller nations makes up a larger portion of their economies, it presents larger risks; those nations need to have proper expectations before spending the money. (10/25 #4)
- A $7.5 billion natural gas pipeline from **Iran to Pakistan** that supporters say would help Islamabad overcome crippling energy shortages, is under fire, even from Pakistanis, and it's taking some interesting twists and turns. (10/25 #9)
- The US and Canada are the only countries producing commercial quantities of **shale gas.** Nearly all of the US production comes from five areas in the central United States and approximately 15 percent of Canada's production came from northern British Columbia and Alberta. (10/25 #20)
- If **the Marcellus Shale** was a country it would be the eighth largest producer in the world. For the first time in 2013 there is a supply glut as winter begins. This shows no sign of stopping. Wells are getting bigger, better and faster and billions of dollars of investments are being planned. (10/24 #4)

- In Britain, an agreement reached this week on electricity "strike prices" for a **new nuclear power plant** could spur more development. (10/24 #26)
- **India** has connected a much-delayed nuclear complex to the power grid in the south of the country and expects it to be supplying millions of industrial and household consumers with it by year-end. The commissioning of the reactor will ease India's power shortages and help bridge a power-supply gap estimated at up to 9% of total demand. (10/23 #17)
- **China's home prices** rose 9 percent in September, the most in nearly three years, adding to fears that a property bubble. The increase was the biggest since January 2011, showing China's four-year-long campaign to keep property prices under control has had limited and uneven success. (10/22 #20)
- The governors of 8 states-California, Connecticut, Maryland, Massachusetts, New York, Oregon, Rhode Island and Vermont-have signed a memorandum of understanding to take specific actions to put 3.3 million **zero emission vehicles** on the roads in their states by 2025. (10/25 #23)
- The **Irish government** said it's committed to meeting 40 percent of electricity demand through renewable resources like wind and solar power by 2020. For 2012, renewable energy provided 19.5 percent of the electricity in the Irish market. (10/26 #18)
- **Scotland's government** said 52 of the 56 applications under consideration for new energy projects are for onshore wind developments. Scotland has an ambitious goal of generating 100 percent of its electricity from renewable resources by 2020. (10/26 #19)
- **T**he UN climate chief is calling for action to avoid disasters such as the bushfires in New South Wales, **Australia** which she links to climate change. A line of wildfires nearly 1,000 miles long is raging through Australia's most populous state. (10/23 #14)
- Thousands of people have marched in **Bahrain**, demanding more reforms in the country. An Associated Press journalist saw police fire tear gas at demonstrators. Bahrain has been gripped by nonstop unrest after the kingdom's Shiite majority began an uprising in early 2011 calling for a greater political voice. (10/26 #4)