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PEAK OIL REVIEW

Association for the Study of Peak Oil & Gas USA

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1. Oil and the Global Economy

Oil prices surged 4.7 percent on Wednesday and Thursday, topping $110 a barrel in London and nearly $109 in New York when prices came within 16 cents of setting a 16-month high. The optimism about possible economic growth earlier in the week was dampened on Friday when US employment numbers and factory orders were worse than anticipated. Despite a drop in the nearly meaningless jobless rate number to 7.4 percent, Americans are working fewer hours and taking home less pay. Coupled with profit taking from the two day surge, this news sent oil down by $1 a barrel on Friday to close at $106.94 in NY and $108.95 in London. Brent was supported by the announcement that refinery strikes in Libya had curtailed exports by nearly 1 million b/d.

Following the economic reports on Friday, pessimism swept the oil markets with many traders expressing the sentiment that the US economic "recovery" may not be as robust as hoped. The announcement by the Federal Reserve that it needs more data before deciding on the course of quantitative easing has many believing there will be no change in policy before the end of the year. As the Federal Sequester starts to take hold and 200,000 federal workers are forced to work less hours, the impact of the gridlock in Washington is starting to dawn on traders.

There was much discussion last week on the troubles of the big international oil companies, who are missing output and profit forecasts and are struggling to keep costs down. As the national oil companies shut them out of the most profitable ventures, these companies are forced to take on risky deepwater and even riskier arctic projects to maintain production.

Demand for gasoline in the US recently has increased by nearly 10 percent over 2012 and is contributing to higher US gasoline prices with are up 4.6 percent in the last month. The AAA says it expects gasoline prices to continue rising through Labor Day. New car sales in the US continue to surge and are now close to 2007's pre-recession 16 million vehicles.

Natural gas futures fell to a new five-month low of $3.34 per million on Friday and much of the US (but not Texas) was experiencing milder weather as gas stockpiles continue to increase. The EIA reported that natural gas use by the power sector in May was down by 24.8 percent over last year as higher gas prices were driving utilities back to coal. Analysts believe that if natural gas falls to $3.20 again, electricity producers will begin switching back again.

2. The Middle East & North Africa

Concerns continue to rise over the vulnerabilities of the Middle Eastern oil facilities to the new wave of terrorist attacks and popular uprisings in the region. Last week Iraq's northern export pipeline to Turkey was blown up once again. This is happening so frequently that its continued use for getting Iraqi oil to market is in doubt. Bombings also took place last week in Basra, Iraq's oil capitol which is deep in Shiite territory that has been relatively immune to Sunni/al Qaeda bombings in recent years. So far there have been no major attacks on foreign oil workers such as we saw in Algeria last winter. However, it would not take much as has happened in Libya and Algeria to spark a withdrawal of foreign oil companies which would likely lead to setbacks for Iraq's oil industry. Given the growing strength of al Qaeda in Iraq, the likelihood that the proposed Iran-Iraq natural gas pipeline would last very long is rather low.

In late July 2012, al Qaeda in Iraq announced a "breaking of the walls" campaign through which it would seek to increase its experienced manpower through a series of jail breaks freeing imprisoned terrorists. So far this campaign has been a roaring success with eight prison breaks culminated by the attack on Baghdad's Abu Ghraib which freed 500 experienced terrorists.

Over the weekend tribesmen blew up Yemen's main oil pipeline halting all exports.

When added together, the loss or reduction of oil and gas exports from Algeria, Libya, Syria, Iran, Iraq, Egypt, Yemen, and South Sudan is starting to add up and is almost certainly contributing to the upward creep in global oil prices. Part of this problem is the growing animosity between Sunnis, Shiites and Kurds in the region.

Iran: The new President, Hassan Rohani, was sworn in on Sunday as the country's economic crisis deepens. As the economy continues to deteriorate, it is becoming apparent that the only way out is to reach a settlement with the West over the nuclear issue and have the sanctions lifted. Although chances of a deal are still seen as low, a new wave of data about how bad the economic situation really is may be enough to prompt a change in policy.

Iran's four top oil buyers, China, India, Japan, and South Korea cut their oil imports by more than a fifth during the first six months of the year and may soon face increased pressures from Washington due to a new bill passed by the US House last week. This bill imposes harsh US penalties on any country buying Iran's oil as is intended to completely halt Iranian exports. It will not move to the Senate until September and is controversial in that the White House believes it could complicate future negotiations with Iran. Last week Tehran announced it was bartering 315 Chinese-built subway cars in payment for oil shipments showing that the financial aspects of the sanctions are leading to some bizarre deals.

Iraq: Last week started with a round of bombings against Shiite targets that killed more than 60 and wounded hundreds. The 17 well-coordinated blasts marked the deadliest violence since the Sunni/al Qaeda insurgents stepped up violence last year. This past weekend another 19 were killed in bombings and shootings. The UN reports that over 1,000 Iraqis were killed in the violence during July, up from 761 in June.

Iraq's exports fell by 1.2 percent in July to 2.3 million b/d largely due to a lengthy closure of the northern export pipeline to Turkey. Exports from the southern export terminal last month were reported as 2.14 million b/d as compared with 2.13 in June. Only an average 180,000 b/d made in through the northern pipeline in July. If last week's attack was as bad as initial reports say, this number will likely fall, possibly to zero, in August.

It now appears that Iraq is headed for the first annual decline in oil output for three years. Between 2010 and 2012 foreign oil companies such as BP, Exxon, and Eni raised Iraqi oil production by 600,000 b/d making the country the fastest growing oil exporter. Unless there is a big change, however, Iraqi production is likely to fall below 2.9 million b/d in 2013.

Talks focusing on energy took place between the Turks and Iraqi Kurds in Ankara last week. Genel Energy, an oil company headed by former BP CEO Tony Hayward, announced that an oil export pipeline between Iraqi Kurdistan and Turkey should be in place by the end of the year. Genel has been exporting the Kurdish oil to Turkey by tanker truck, but the new pipeline adds a capacity of 80,000 b/d and will cut transportation costs. Genel's oil fields in Kurdistan may have the capacity to produce 200,000 b/d by the end of next year.

Although oil production in Iraqi Kurdistan is rising, some believe that there is more potential in exporting natural gas to Turkey. Genel says its resource estimates for natural gas in Kurdistan have doubled recently and it is planning to sell Turkey 10 billion cubic meters of gas annually.

Libya: Strikes and protests at major oil terminals cut Libya's exports to some 400,000 b/d from more than a million last week. Last month's output was down to 1.1 million from 1.3 million in June due to scattered protests. Most of the protests involve jobs and money, with current workers wanting more pay and the unemployed wanting jobs in the oil industry. One oil field with a capacity of 130,000 b/d has been shut down for weeks. As these shutdowns are rather benign compared to most in the Middle East, production is expected to resume shortly.

The country, however, is far from stable, with the central government wielding little real power. Random shootings, bombings, and clashes with security forces still take place almost daily. More than 1000 prisoners who escaped in a mass prison break two weeks ago are still running around adding to the insecurity. All this says it will likely be a while before we see Gaddafi-era 1.6 million b/d of oil production again.

Egypt: Supporters of deposed President Morsi continued to stage protest rallies across Cairo last week. The Army and new government have ordered protesters numbering in the hundreds of thousands to disband. Some 140 pro-Morsi protesters have been killed in confrontations with security forces since the upheavals began. Washington has senior officials in Cairo attempting to mediate the situation and continues to warn the government against using violence. So far, the efforts only seem to have succeeded in getting both sides mad at the US. Chances are good that the current confrontation will end in violence as happened 10 days ago. Washington is increasingly concerned that the confrontations are leading to a prolonged period of instability and violence, which will likely lead to problems with oil exports from the region some day.

3. China

It is becoming conventional wisdom that China's economy is in for a period of slower growth after nearly 30 years of rapid expansion. Our issue here, however, is just how fast China's demand for oil will grow in the years ahead. There is already increasing discussion to the effect that Beijing's official growth numbers, which are prepared by officials whose careers depend on fostering economic growth, do not square with other growth indicators such as electricity consumption and that "real" as opposed to "official" growth may already be closer to 5 percent than the official numbers say.

Last week an interesting forecast was published by some Wall Street analysts pointing out that while it is likely that China's GDP growth will slip, this does not necessarily mean that the growth in China's oil demand which has averaged an annual 6.3 percent over the past five years will fall as well.

The argument is that the decline in China's economic activity will happen mainly in heavy industries such as construction, mining, and steel which consume relatively small amounts of oil. Other economic activities such as transportation and household consumption (gasoline), which have been using an increasing share of China's oil consumption, will continue to grow more quickly. The total number of private vehicles in China has been increasing by 19 percent annually during the last ten years. A recent analysis of China's gasoline consumption has it up 11 percent from last year as new cars continue to flood the streets. China still has far fewer private vehicles than would be expected for its per capita wealth so it could be entering a period of accelerating vehicle ownership.

A handful of Chinese cities, however, have already placed restrictions on new automobile registrations to cope with congestion and air pollution, but most of the country will not be affected by these regulations. Most Chinese oil fields are aging so that the country is unlikely to grow its domestic production much beyond 2 percent a year for the next few years. While there has been much talk of fracking shale, so far there has been little progress and some believe China's shale is not as susceptible to horizontal drilling and fracking as that in the US. The country also has a severe water shortage problem.

If this hypothesis is correct, we could be seeing a steady, or even increasing Chinese demand for imported oil in the years ahead even if the economy slows.

4. Quotes of the Week

- "In Syria the genie of militant sectarianism is out of the bottle…Before long, Syria's civil war could turn into an all-out sectarian conflict involving the entire region."

  -Thomas Hegghammer and Aaron Zelin, Foreign Affairs magazine

- "Oil is close to a peak. This is not the 'peak oil' widely discussed several years ago, when several theorists, who have since gone strangely quiet, reckoned that supply would flatten and then fall. We believe that demand, not supply, could decline.

  - The Economist, "Yesterday's Fuel"

5. The Briefs

- Proved oil **reserves** in the USA increased a record 15 percent to 29 billion barrels in the latest report from the Energy Information Administration, based on reserve additions from 2011. Natural gas reserves were up almost 10 percent. (8/3 #18)
- **US crude oil imports fell** 13.2% to an 18-year low for May of 7.737 million barrels a day. (7/31 #15)
- The Bakken and Eagle Ford are expected to account for more than half of **Wood Mackenzie's** anticipated North America tight oil production volumes of more than 5 million b/d by 2019. They estimate average 2013 production from the Eagle Ford will be 844,000 b/d, about 50 percent greater than the 2012 average. Anticipated growth in US crude oil production is estimated to cut waterborne imports of crude to 15% of the US oil supply by 2020 compared with about 44% now. (8/2 #22)
- Apache Corp. announced it made seven oil and natural gas discoveries in the Western Desert of **Egypt.** Yet several companies with operations in Egypt evacuated non-essential staff when violence erupted last month. (8/2 #13)
- Italy's energy company **Eni** made its biggest oil find in recent years offshore of the Republic of Congo. Eni estimates 600 million barrels of oil and 700 billion cubic feet of gas are in place. (8/2 #16)
- **Brazil** produced an average 2.10 million barrels of crude oil per day in June, up 5.4% from May and up 3.3% from June 2012. Production jumped in June as offshore platforms idled for maintenance returned to production and record volumes of crude were pumped from deep-water fields in the country's pre-salt region. (8/3 #14)
- **Mexico's President** Enrique Peña Nieto is set to unveil a long-awaited proposal to change the constitution in an effort to lure back major private oil companies for the first time since the 1938 nationalization. (8/3 #15)

- **Revenue from petroleum exports in OPEC** nations broke a new record in 2012. They rose by 9.2% to $1.261 trillion. But the earnings of some members are declining amid higher budgetary needs, underscoring a deepening rift between producers benefiting from higher oil prices and those who don't. (7/30 #6)
- The Arab Petroleum Investments Corp. which was set up by Arab oil producers, said the average price needed to balance the budget of **OPEC** member**s** has risen from $99 per barrel in 2012 to $105 in 2013. (7/29 #6)
- Oil output from **Russia** fell 1 percent in July to 10.43 million b/d from the month prior, hit by lower production at Gazprom and a drop in output from projects with foreign partners. Russia's all-time record production was 11.48 million barrels, back in 1987. (8/3 #26)
- **Shell** is to pull out of its oil activities in Niger Delta. The 'recklessness' and size of oil thefts—an estimated 60,000 b/day—are forcing Shell to halve its activities in the country. (8/3 #13)
- In **Alberta,** oil is seeping to the surface at a slow rate from four sites at the Cold Lake Air Weapons Range. It started as the release of more than 6,000 barrels of heavy Canadian crude oil in May. The field is operated by Canadian Natural Resources Ltd. (8/2 #26)
- **Exxon Mobil and Chevron** are spending unprecedented billions of dollars to find and extract petroleum, hunting in harder rocks, deeper underground and farther offshore. Exxon's oil and gas production fell 6% from 2011, to 4.2 million barrels a day. Chevron's production fell 2.4%, to 2.6 million barrels a day. (8/1 #26)
- Last week's round of Big Oil **earnings reports** showed that some of the world's dominant energy companies are struggling to make money from massive bets on the shale boom in North America. The Wall Street Journal explains that this is because the deposits of oil and gas found there are proving abundant, but not always profitable. (8/3 #5)
- **In the US arctic,** infrastructure limitations and costs to construct new systems for mineral as well as energy development, along with potentially serious damage from an oil spill, make the American Arctic scales tip slightly toward environmental stewardship and protection, according to a new study from the Center for Strategic and International Studies. (8/2 #24)
- Growth in **tight oil production** has been facilitated by considerable growth in debt. A company can only take on so much debt before its financial resilience becomes threatened by even moderate declines in the oil price. (8/29 #25)
- **Ethanol** prices gained against gasoline after production of the biofuel tumbled by 5 percent to the lowest level in more than three months. (8/3 #20)
- Investigations by the **Federal Energy Regulatory Commission** are fueling a debate among lawmakers and the Federal Reserve over whether to reverse more than a decade of policy decisions that let Wall Street banks keep or build units handling commodities and energy. (8/3 #21)
- The fight for a measure of autonomy by **Syria's Kurds** is the newest conflict in a broader struggle in which Kurds--spread across Turkey, Iraq, Syria and Iran and oppressed for decades--are trying to take advantage of the chaos in the Middle East to achieve longstanding ambitions for self-government and democratic rights. (8/2 #15)
- **Iran** has agreed to supply Damascus with $3.6bn in oil in exchange for the right to invest in the country. (7/31 #4)

- **The American Petroleum Institute** commissioned PricewaterhouseCoopers to survey job creation in the US energy sector. The survey found the oil and natural gas sector supported 9.8 million jobs in 2011, an increase of more than 600,000 since 2009. (8/2 #20)
- The oil industry forecasts long car lines at gasoline stations or substantially higher prices at the pump if the EPA doesn't roll back mandates for **renewable-fuel use**. (8/29 #21)
- **TransCanada Corp.** plans to go ahead with a $12 billion pipeline that will ship oil from Western Canada to the East Coast. The Energy East pipeline would have a capacity of 1.1 million barrels a day and be in service by the end of 2017. The new line would be in addition to the Keystone XL pipeline. (8/2 #25)
- In **North Dakota**, nearly one-third of the natural gas produced as a side-effect of the Bakken oil is being burned off in the air, a practice known as flaring. The result can be seen from space—the 18,000 square-mile Bakken is lit up like a city. Low prices, remote locations and the time and expense of developing pipelines all work against processing the gas. (8/1 #6)
- **China,** believed to hold the world's largest resource of **shale gas**, hopes to replicate the production boom seen in the United States, but it faces technological and environmental challenges due to complex geology and scarcity of water. (7/31 #12)
- **China won't let earthquakes** hinder its quest for energy. Companies such as Royal Dutch Shell Plc and China National Petroleum Corp. are starting to drill for gas and oil in shale rock in Sichuan, the nation's most seismically active province, a process geologists say raises the risk of triggering quakes. (8/1 #20)
- **The US** is on course to meet its greenhouse gas reduction target of 17 percent below 2005 levels by 2020, said Energy Secretary Ernest Moniz. About half of that progress comes from the natural gas boom and its substitution for coal-fired electricity generation. (8/3 #17)
- An EPA employee said **gas drilling damaged drinking-water aquifers** in a Pennsylvania town, according to a presentation the staffer prepared for superiors before they agreed to end deliveries of clean water to the residents. The previously unreleased document found that fracking caused methane to leak into domestic water wells in Dimock, Pennsylvania. The findings contradict those of Cabot Oil and Gas Corp. (7/30 #13)
- Reaching driving age doesn't hold the magical allure it once did for **US teenagers**, with fewer than half of them applying for a driver's license when they reach legal age. (8/1 #24)
- **Kuwait's ruler** has used the opportunity of Ramadan - the month of fasting associated with forgiveness - to pardon all those convicted of offending him. The announcement on Wednesday is an apparent effort to help defuse political tensions after last week's parliamentary elections in the Gulf nation. (7/31 #7)
- The consortium behind the **TAP gas pipeline from Azerbaijan** said BP, French oil company Total and Azerbaijan's energy company came on board as members Tuesday. The project is part of the so-called Southern Gas Corridor, a network of pipelines planned to add diversity to a European market dependent on Russian natural gas. (7/31 #18)
- Saudi Arabia and the UAE are readying the Middle East's first big push into **renewable energy**, planning solar-power plants that will need more than $1.5 billion in financing by the end of 2014. (7/30 #5)
- **Jordan's** controversial plan to raise power prices in August for a second time this year is set to go ahead despite warnings such measures could lead to serious civil unrest. (7/30 #8)

- Scientists in Japan and the U.S. say they are moving closer to tapping a new source of energy: **methane hydrate**, a crystalline form of natural gas found in Arctic permafrost and at the bottom of oceans. (8/29 #4)

7. Commentary: Why is Saudi Arabia not a Threat to Fracking?

By: Jeffrey J. Brown

(Note: Commentaries do not necessarily represent the position of ASPO-USA.)

Several media outlets have recently carried a story about a prominent Saudi prince warning that Saudi Arabia is increasingly vulnerable to competition from the US shale revolution, as a result of fracking in tight/shale plays.

I would turn the question around and ask why is Saudi Arabia not a threat to fracking?

Note that as annual Brent crude oil prices doubled from $25 in 2002 to $55 in 2005, Saudi net oil exports increased from 7.1 million b/d in 2002 to 9.1 million b/d in 2005 (total petroleum liquids + other liquids, EIA).

The Saudi Oil Minister, in early 2004, explicitly stated that the then ongoing large increase in Saudi net oil exports was an attempt to bring oil prices in line with the then stated goal of maintaining a $22 to $28 oil price band. In any case, at the 2002 to 2005 rate of increase in Saudi net oil exports, their net oil exports would have been over 16 mbpd in 2012, as annual Brent crude oil prices more than doubled again, from $55 in 2005 to $112 in 2012, with one year over year decline in oil prices, in 2009.

However, in contrast to the 2002 to 2005 Saudi response to a doubling in the price of oil, the Saudis have shown seven straight years of annual net exports below the 2005 rate of 9.1 mbpd, with Saudi net oil exports ranging between 7.6 and 8.7 mbpd for 2006 to 2012 inclusive, as annual oil prices doubled again.

If the Saudis have virtually infinite oil reserves, and their public pronouncements continually suggest that they have the "capacity" to produce well in excess of 12 mbpd almost indefinitely, why are they allowing high oil prices to encourage alternative sources of oil production, e.g., the very expensive and very high decline rate shale plays in the US?

While it's certainly at least possible that the Saudis abandoned their traditional swing producer role, and decided to encourage, starting in 2006, higher oil prices, and thus encourage alternative sources of oil, by cutting their net oil exports, it's also at least possible, as Matt Simmons suggested in 2005, that Saudi oil fields are finite after all.

I realize that this is a controversial assertion--that Saudi Arabian oil fields are not infinite--but it's a possibility that is at least worth considering.
At the 2005 to 2012 rate of decline in the ratio of Saudi liquids production to liquids consumption, I estimate that Saudi Arabia, like many other former net oil exporters, e.g., Indonesia, could be approaching zero net oil exports in less than 30 years. This would imply that Saudi Arabia may have shipped about half of their post-2005 Cumulative Net Exports of oil by the end of 2017.

In fact, an examination of 2005 to 2012 data indicate that a majority of the Top 33 net oil exporters in the world in 2005 are already headed toward the point in time when they would become members of AFPEC--the Association of Former Petroleum Exporting Countries.

While currently increasing US crude oil production is very helpful, it is very likely that we will continue to show the post-1970 "Undulating Decline" pattern that we have seen in US crude oil production (currently US crude oil production is about 25% below our 1970 peak rate), as new sources of oil come on line, and then inevitably peak and decline.

The very slow increase in global crude oil production since 2005, combined with a material post-2005 decline in Global net oil exports, have provided considerable incentives for US oil companies to make money in tight/shale plays. But I think that the assertion by many in the Cornucopian camp that shale plays will result in a virtually infinite rate of increase in global crude oil production is wildly unrealistic.

We are still facing high--and increasing--overall decline rates from existing oil wells in the US. At a 10%/year overall decline rate, which in my opinion is conservative, the US oil industry, in order to just maintain the 2013 crude oil production rate, would have to put online the productive equivalent of the current production from every oil field in the United States of America over the next 10 years, from the Gulf of Mexico to the Eagle Ford, to the Permian Basin, to the Bakken to Alaska. Or, at a 10%/year decline rate from existing wells, we would need the current productive equivalent of 10 Bakken Plays over the next 10 years, just to maintain current production.

On the natural gas side, a recent Citi Research report (estimating a 24%/year decline rate in US natural gas production from existing wells), implies that the industry has to replace virtually 100% of current US gas production in four years, just to maintain a dry natural gas production rate of 66 BCF/day. Or, at a 24%/year decline rate, we would need the productive equivalent of the peak production rate of 30 Barnett Shale Plays over the next 10 years, just to maintain current production.

The dominant pattern that we have seen globally, at least through 2012, is that developed net oil importing countries like the US were gradually being forced out of the market for exported oil, via price rationing, as the developing countries, led by China, consumed an increasing share of a declining post-2005 volume of global oil exports.

For more information on global net exports of oil, following is a link to a recent article on the topic:

http://peak-oil.org/2013/02/commentary-the-export-capacity-index/

Jeffrey J. Brown is a licensed professional geoscientist. He has conducted analysis of Peak Oil issues for many years, and has authored numerous articles with a special emphasis on global oil exports. In early 2006, Jeff first proposed a simple mathematical model for oil-exporting countries called the "Export Land Model" (ELM), which is now regarded as foundational for analysis of this critical issue.