



PEAK OIL REVIEW

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1. Oil and the Global Economy

Oil prices were little changed last week, but managed to close out November a few dollars higher than the October closing thereby registering the first monthly increase since August. New York futures ended the week at \$88.91 and London at \$111.23. Better economic news, including higher US GDP numbers, offset concerns about the coming “fiscal cliff” and bad economic news from the EU. Unrest across much of the Middle East continues to support prices although no specific threats to oil exports are in sight.

The weekly US stocks report contained little of note – US crude imports over the last four weeks have been running about 700,000 b/d lower than last year and distillate inventories, which are way below normal, continue to fall. With global demand for distillates running above what the global oil industry can produce, it seems likely that higher prices or even shortages are in the offing.

US natural gas prices fell 8.7 percent last week to close at \$3.64 per million after the EIA reported an unexpected jump of 4 billion cubic feet in inventories and forecasters predicted warmer weather in the immediate future. Natural gas prices were over \$4 per million BTUs in mid-November. The price drop since then has caused a return to coal of the part of some utilities.

2. Middle East

With the fighting between Israel and Hamas over for a while, the spotlight shifted to Egypt where new Presidential decrees, which many saw as the assumption of dictatorial powers, brought protesting crowds back to Tahrir Square. These secularist demonstrations were closely followed by Islamist crowds backing the President and shutting down the judicial court that is working on a new constitution. The root of the unrest is an effort by President Morsi and his supporters to push through

a new constitution that some protestors fear will turn Egypt into an Islamist state by enshrining religious beliefs and practices in the new constitution. Some observers fear the tensions between Islamists and secularists will soon deteriorate into violence adding yet another dimension to the burgeoning Middle East Crisis. Ethiopia's efforts to dam the Blue Nile, a project which is 13 percent completed, could deprive Egypt of 25 percent of its water while the dam is filling. The Nile is the only source of water for Egypt's 84 million people so continued work on the dam is almost certain to lead to more troubles.

The situation in Syria continues to get worse, with the rebels cutting access to the Damascus airport, forcing its closure, in addition to overrunning numerous military bases. The internet and other communications in Syria were out for two days last week but seem have been restored. Government aircraft continue to bomb rebel positions in the Damascus suburbs as the rebels prepare for a final push on the capital.

Reports from Washington suggest that the Assad government may be moving chemical weapons in anticipation of using them against the rebels as a last ditch tactic. If this happens, it is likely to result in some sort of Western intervention to secure the weapons. This development in turn could further increase tensions in the region.

Terrorist bombs continue to go off in Iraq. Some 2,000 Iraqis now have been killed by such attacks since the US pulled out a year ago. If the violence continues it is likely to threaten ambitious plans to increase oil production. Iraq's production slipped by 200,000 b/d in October a possible harbinger of things to come.

Renewed violence in Jordan is just below the surface as the monarchy that has kept the country relatively stable since 1921 faces a serious threat to its existence. Troubles in Libya, still without any solid governance, continue. The major refinery outside Tripoli is closed periodically by protestors and the chances in increased foreign investment to maintain oil production seem dubious.

There was little change in the Iranian nuclear confrontation last week. The head of the IAEA told the organization's board that he cannot provide "credible assurance that Tehran is not developing nuclear weapons. Iran appears to be preparing for continued sanctions and is basing its budget exports of 1 million b/d down from 2 million in 2011. Countries continuing to import oil from Iran – India, Turkey, South Korea, Sri Lanka, Taiwan, Malaysia, and South Africa – appear to be making satisfactory progress in cutting their Iranian imports thereby avoiding tough US sanctions laws. The situation for China is still unclear.

In Washington, the US Senate voted harsher sanctions on anyone trading with Iran, a move opposed by the Administration as only complicating negotiations.

3. Europe

Athens avoided going bankrupt for a while longer last week, after its EU creditors agreed to lend it the money to keep functioning. After three weeks of negotiations, the Eurozone and the IMF agreed to \$57 billion in loan payments and Greece agreed to series of measures designed to improve its debt posture. Implicit in the deal seems to be some sort of understanding that the creditor nations will eventually forgive a portion of Greece's mounting debts. The EU also agreed to a restructuring of Spain's banks.

The bad news for the week was that Eurozone's unemployment reached a new record in October with another 173,000 out of work. Coupled with this news was a spate of statements by senior EU economic officials to the effect that clear progress is being made in the Greek and Spanish situations and that the situation should get better next year.

The OECD cut its global growth forecasts last week that the debt crisis in Europe is the greatest threat to the world economy. The organization now says that the global economy will grow only 2.9 percent this year and 3.4 percent in 2013 down from the previous forecast of 3.4 and 4.2 percent.

4. The Climate Summit

The UN climate summit opened in Qatar last week with some 17,000 delegates in attendance. China took the lead in stating that economic growth to "eradicate poverty and improving living standards" takes precedence over reducing emissions "for a period of time." The EU said it was in no position to help developing countries reduce emissions to meet climate objectives. The US said it couldn't go on the 17 percent reduction target for emissions for 2020.

Accompanying the meeting, the World Bank issued a report saying that extreme weather patterns may become worse if governments fail to reach their climate goals; the World Meteorological Organization reported that this year was the ninth-warmest on record; and the US Intelligence Community chimed in with a report saying that says the consequences of climate change--rising sea levels, severe flooding, droughts, fires, and insect infestations--pose threats greater than those from terrorism ranging from massive food shortages to a rise in armed conflicts.

Some are hopeful that Super storm Sandy might mark a turning point in the climate change debate. So far there is little evidence that this is happening. The US position at the summit did not change markedly, the administration does not have climate change as a priority, and senior Republicans in Congress are still saying they will block any climate change legislation.

Quote of the week

- "Mr. President, let me just see if I can move you to the gist of this question, which is, are we looking at the new normal? I can tell you that tomorrow morning, a lot of people in Hempstead will wake up and fill up and they will find that the price of gas is over \$4 a gallon. Is it within the purview of the government to bring those prices down, or are we looking at the new normal?"

- Candy Crowley, moderator of the second presidential debate

The Briefs (clips from recent Peak Oil News dailies are indicated by date and item #)

- For the first year since the futures were created, **Brent crude** is poised to overtake West Texas Intermediate oil as the world's most-traded commodity. (11/26, #4)
- **Saudi Arabian** oil minister Ali Naimi has called for the rationalization of the kingdom's domestic energy use as oil consumption was growing at 'a frightening level.' (11/26,#10)
- Environmental regulation and disappointing drilling tests have held back the development of shale gas reserves in Europe. **Algeria** however, is using tax breaks to encourage exploration.

Pipelines under the Mediterranean to Spain and Italy already link Africa into Europe's grid. (11/26,#14)

- A large tanker carrying LNG is set to become the first ship of its type to sail across the **Arctic**. The Ob River, left Norway in November and has sailed north of Russia on its way to Japan. The specially equipped tanker is due to arrive in early December and will shave 20 days off the regular journey. (11/26,#22)
- **Yemen** is facing a fuel crisis because of repeated attacks on an oil pipeline feeding a major refinery in Aden, (11/27, #4)
- India's Oil & Natural Gas Corp plans to pay as much as \$5 billion to ConocoPhillips for a stake in a **Kazakhstan** oil project. This move could herald more such deals by Indian energy companies seeking to offset declining domestic production. , (11/27, #4)
- The US **Alaska** Petroleum Province holds mean estimates of undiscovered, technically recoverable oil and gas resources of nearly 30 billion barrels of oil, about 179 trillion cubic feet of non-associated gas, and 40 trillion cubic feet of associated gas, according to a new assessment published by the US Geological Survey. (11/28, #5)
- **China** is mulling changes to its one-child policy, a former family planning official said, with government advisory bodies drafting proposals in the face of a rapidly ageing society. (11/28, #14)
- Venezuelan President **Chavez** has arrived in Cuba, where he had months of cancer therapy, for further medical treatment. Chavez, who was re-elected in October, is due to be sworn in for a third term in January. (11/29, #13)
- As **China** readies for the water-intensive process of hydraulic fracturing to tap into massive reserves of shale gas, concerns are rising regarding the country's already limited water supply. (11/29, #14)
- General Motors and its joint venture partners in **China** say they will spend \$1 billion to build a third car plant to keep up with demand for vehicles in the world's biggest auto market. (11/29, #15)
- **Mississippi River** barge traffic is slowing as the worst drought in five decades combines with a seasonal dry period to push water levels to a near-record low. (11/29, #19)
- An Oklahoma energy company said there wasn't enough interest to move ahead with a planned 1,300-mile oil pipeline from the **Bakken** oil pay. (11/29, #19)
- The melting of the Antarctic and Greenland **ice sheets** has raised sea levels by 11.1 millimeters since 1992, a fifth of the total rise which threatens low-lying regions around the globe. (11/30, #4)
- Levant LNG Marketing has concluded a cost-sharing agreement with **Israel's** Tamar Partners that marks progress toward the export of LNG from Tamar and Dalit fields 60 miles off Israel in the Levantine basin. (11/30, #7)

- **India's** economy slowed further in the three months to September, with year-on-year growth dropping to 5.3 per cent from 5.5 per cent the previous quarter. (11/30, #12)
- The **US birth rate** hit a record low last year, led by the decline in child-bearing among foreign-born women, according to a Pew study. The overall US birth rate decreased by 8 percent between 2007-10, and by 6% among US-born women. (11/30, #12)
- Russian oil company **Lukoil** could make a decision to expand in the Iraqi oil sector through participation in the West Qurna field, an executive said. (12/1,#8)
- Brazilian government-run oil company Petroleo Brasileiro said it has canceled plans to hire five drilling rigs from Norway. **Petrobras** said it won't need as many rigs as it had initially expected, because it won't have to drill as many wells due to "higher productivity gained through the project wells." (12/1,#17)
- **Natural-gas** output in the Lower 48 U.S. states rose 0.6% in September from an upwardly revised August level and was up 3.9% from a year earlier (12/1,#20)
- Some landowners, groups worry that drilling for oil and gas will drain **Ohio** wells, reservoirs. (12/1,#20)
- The US Department of Energy has selected a multi-partner team led by Argonne National Laboratory for an award of up to \$120 million over five years to establish a new **Batteries and Energy Storage Hub**.(12/1,#27)
- The US drilling **rig count** lost 6 units during the week ended Nov. 30, with the total number of rotary rigs reaching 1,811. (12/1,#28)

Commentary: Identifying the “Oil” We’re Most Worried About

By Robert L. Hirsch

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

World “oil” has been defined in different ways by different entities. IEA and EIA have defined it as total hydrocarbon liquids—including crude oil, lease condensates, natural gas liquids, heavy oil, oil sands, biofuels, and refinery processing gains. For his detailed studies, Colin Campbell has used the following categories: 1) regular conventional oil and gas; 2) heavy oil (<17.5 deg. API) and bitumen; 3) oil from oil shale (derived by heating immature source-rocks); 4) tight oil (also known as shale oil, extracted by hydraulically fracturing rock formations lacking adequate natural porosity and permeability); 5) deepwater oil (>500m); 6) polar oil; and 7) natural gas liquids (NGLs) from gas plants. Other analysts have chosen to use energy content as a means of differentiating between “conventional oils” and lower energy-content liquids, such as NGLs and biofuels.

These and other definitions have value in different contexts, but I’ve long been uneasy about them in the context of explaining the impending tragedy of “peak oil” to the public. I’ve also felt that the term “peak oil” has shortcomings, because of the various ways the term has been defined. I prefer the less catchy phrase “the impending decline of world liquid transportation fuels,” because when that decline

sets in, the world will be faced with transportation fuel shortages and escalating prices, which will be the tragedies about which many in the “peak oil community” have been so concerned.

A number of months ago, I queried some colleagues on alternate definitions of “oil” to better describe the term in a way that might make better sense to a wider audience. Kjell Aleklett, professor of physics at Uppsala University in Sweden, suggested using transportation fuels produced from refineries. That concept struck me as potentially useful, and I pursued it further.

Long story short, I believe that a strong case can be made that the decline in world transportation fuels will mark a major turning point in modern economies, because of the importance of such fuels to essential human activities. The initial decline rate has been estimated by various analysts and is open to uncertainty, because of the myriad of variables involved. The long-term rate of decline will dictate the degree of economic damage; if it’s rapid, say 3-5 percent, it will likely be catastrophic, but if it’s less than 1 percent for a reasonable period, it likely can be accommodated without severe consequences.

Data on world refinery product production is available from various sources. One --the *BP Statistical Review*—provides the following world refinery product breakdown: **light distillates**, consisting of aviation and motor gasolines and light distillate feedstock; **middle distillates**, consisting of jet, heating kerosenes, gas and diesel oils (including marine bunkers); **fuel oil**, including marine bunkers and crude oil used directly as fuel; and **others**, consisting of refinery gas, LPG, solvents, petroleum coke, lubricants, bitumen, wax, other refined products and refinery fuel and loss. This breakdown gets us a long way towards isolating transportation fuels but not all the way. Light and middle distillates and fuel oils encapsulate the following transportation fuels: motor and aviation gasolines, jet and diesel oils including marine bunkers. The category of “others” includes products generally not used as transportation fuels. The problem areas include light distillate feedstock, heating kerosenes, and crude oil used directly as non-transport fuel, and biofuels, which, while small, need to be added as the only non-oil-refinery-produced transportation fuel.

In reflecting on this approach, Britain-based analyst Chris Skrebowski made the following points: “Their light distillates include light distillate feedstock (LDF) which to you and me is naphtha and not a transport fuel. Roughly half the naphtha is used as a petrochemical feedstock and half as a reformer feedstock to make a gasoline blend stock. But to avoid double counting, I assume they only count the finished gasoline numbers. Typically petrochemical naphtha accounts for about 5% of the product barrel but can be higher or lower.

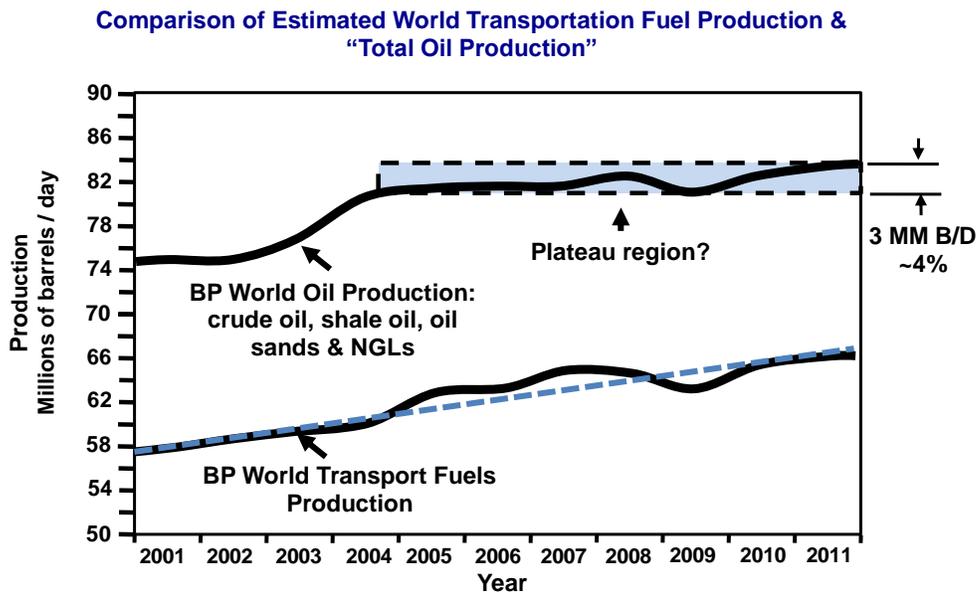
“For middle distillates the main problem is gasoil. Diesel is simply a gasoil that meets acetane and other specifications. Over recent years, more and more of this fraction has been made and sold to diesel specification with the rest sold for heating purposes. Heating kerosene is now too low a volume to worry much about but the gasoil does need to be removed. Data on the gasoil/diesel split is really bad as both the IEA and EIA generally lump them together.

“For fuel oil, the world bunker market globally is under 1 million barrels/day (mbd) with the rest in power generation or other under-boiler use. So what this comes down to is 80% (an earlier approximation) is too high for transport fuels. If you say, as is reasonable, that most lubes and most bitumen use is directly connected to transport but you take out gasoil, naphtha and other fuel oil uses, you’re probably in the 72-75 percent range.”

From an analysis that I did using EIA data and following Skrebowski, I assumed that 75 percent of total world refinery output is probably a good first-cut estimate of world transportation fuel production. Using BP Statistical Review data, June 2012, I estimated world transportation fuel production for 2001-2011. Comparing that with BP's data for "Total (World) Oil Production," yielded the plot below.

Among the conclusions from this preliminary exercise are the following:

- To focus on transportation fuels is to focus on the most important impacts that declining world oil supplies will have on modern economies. This is not to ignore the impacts of shortages of other products on their respective areas of industry and consumers; it is simply a matter of considering greatest likely impacts.
- Estimated transportation fuel production over recent years shows a generally linear growth during the period of the so-called "production plateau" in total liquids. My guess is that the linear increase is the result of refineries pushing their product slates towards the highest price products (transportation fuels) and away from lower valued products. Many refineries have the ability to shift without making large new investments. Detailed analysis is needed to establish that this is the case and the degree that further shifting is possible without and with major new refinery investments.
- In our previous work on mitigation (Hirsch, Bezdek, and Wendling), we did not consider the potential for upgrading lower value, non-transportation products to higher-value transportation fuels. That avenue for transportation fuel production enhancement is viable up to a point and merits more careful analysis to determine the potential, cost, and timing.
- Beyond this preliminary effort, a more detailed analysis might be useful and might yield useful insights.



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