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### 1. Oil and the Global Economy

Oil prices rebounded some \$4 a barrel last week to close at \$96.03 in New York and \$104.56 in London. Optimism about the US economy, rising equity markets, an increase in US demand – some of which may be going to exports, and a large drop in crude inventories were among the reasons given for last week's move. The economic optimism is based largely on a minor increase in hiring, despite a report earlier last week that US factories had their worst May since 2009. Behind all the economic news, however, is the question of just when the Federal Reserve will slow quantitative easing which is seen as supporting oil prices.

A combination of rising US crude production and a substantial drop in imports the week before last resulted in US crude production exceeding imports for the first time in 16 years. This phenomenon is not likely to last for long.

Oil prices have continued to remain relatively strong this year, despite the continuing increase in US oil production, stockpiles surging to record highs, and bad economic outlooks for much of the OECD and China. This suggests that global markets may in reality be tighter than is generally appreciated by the financial press.

US natural gas prices dropped 12 cents per million on Thursday when the EIA reported a 111 bcf injection into storage – the largest increase since October 2011. Other than that report, the natural gas market has been quiet while awaiting definitive weather forecasts on summer temperatures.

The World Bank issued a new report concluding that rising oil prices are the main factor behind rising food prices. The report suggests that the use of corn production for fuel and the ratio of supply to demand are only secondary factors in causing food price increases.

US gasoline prices remain relatively strong despite the weak demand for gasoline. The US average for retail is now \$3.63 which is nearly 10 cents a gallon higher than at this time last year. In the Chicago area local refining problems have drivers in the city paying an average of \$4.55 a gallon last week for regular and premium approaching \$5.

### 2. The Middle East & North Africa

**Iran:** *The Financial Times* reports that Iran's oil output is headed for a 25 year low as Asian customers cut their imports to comply with US and EU sanctions. The four main Asian customers, China, India, Japan, South Korea, as well as Turkey cut their imports to 750,000 b/d in April from 1.1 million b/d in March. After filling available storage, Iran is believed to have cut production to 2.5-2.6 million b/d in May. The biggest cut in imports came from Japan which imported virtually no Iranian oil in April. A cut in Iranian exports of this size is clearly a factor in relatively strong world oil prices as most customers have to look elsewhere for their oil.

The US announced new restrictions on Iran last week including sanctions on any foreign institution doing business with the US that is holding significant amounts of Iranian currency. The hope is that this will force banks to dump their holdings of Iran's rial and further weaken its economy. Other sanctions are aimed at Iran's auto industry which is the second largest employer after oil.

Iran's presidential election takes place this week in which eight mullah-approved candidates are running for president. The election comes amidst increasing economic problems brought on by the sanctions -- especially rising unemployment and rampant inflation. Iran's constitution leaves all the important questions such as acquiring nuclear weapons and intervening in Syria in the hands of the Supreme Leader, the Ayatollah Khamenei, while the President is left to deal with the economic mess brought on by those policies.

Although two western-educated moderates who made it through the screening are running and advocating some reforms, the leading candidate seems to be Saeed Jalili, a disciple of the Ayatollah, who is unlikely to change anything. Four years ago, millions took to the streets to protest the election, but massive clampdowns by the security forces seem to have the opposition cowed.

So far there has been little discussion of how to deal with Iran's main issue which is its nuclear policy and the sanctions. The two reformist candidates have talked about better relations with the outside world, while the Ayatollah continues to thunder against "enemies." Iran's governance, along with growing Sunni-Shiite hostility, will continue to be the important developments which could have a major impact on Middle Eastern oil exports for the foreseeable future.

**Iraq:** There were few notable developments this week. Prime Minister al-Maliki visited Kurdistan for the first time in two years in an effort to resolve the long-standing oil and boundary disputes. Although little is expected to come from the meeting, it comes as hostilities between Sunnis and Shiites are on the rise with car and suicide bombings by both sides taking place daily. The increasing political weakness of the Prime Minister in the face of the turmoil may leave an opening for the Kurds to negotiate a deal with Baghdad.

So far there has been little impact on oil exports – the northern pipeline to Turkey seems to be back in operation – but the talk of civil war continues to grow.

**Syria:** The seizure of the ruins of Qusayr by government forces backed by what is reported to be 4,000 Lebanese Hezbollah Shiite militia has set off a wave of reaction across the region. Sunnis are retaliating against Hezbollah-dominated areas in Lebanon and the Syrian opposition is refusing to engage in peace talks until the situation changes. Hezbollah's forces are supposed to be moving north to relieve the siege of Aleppo. The number of refugees continues to swell -- the UN has asked for \$5 billion to feed them – and the conflict seems destined to go on into the foreseeable future. Some Sunni leaders across the region are already calling for Jihad against Hezbollah and are calling on all Sunnis – and there are some 1.3 billion of them as opposed to 200 million Shiites – to go to the aid of their brethren.

Washington is preparing to leave some F-16 fighters and some Patriot missiles in Jordan just in case, and the evidence is growing that chemical weapons are being used in a limited fashion in the fighting. These weapons really work better against large groupings of conventional forces than what is taking place in Syria. None the less, they could serve as a pretext for Western intervention someday should their use spread.

There was heavy fighting on the Golan Heights as government forces and the rebels fought over the Quneitra border crossing. At one point Syrian tanks were maneuvering in the demilitarized zone prompting stern warnings from Israel which seems to be doing its best to stay out of this mess. Pressures for the West to arm the rebels – beyond the limited covert assistance – are growing. The intervention of Hezbollah is clearly a turning point in this uprising converting it into the first step in a sectarian regional war. The turmoil has not gotten to the region's oil exports in a major way as yet, but there seems little to stop it.

**Egypt:** Cairo is struggling to complete oil import deals with Iraq and Libya. The country is nearly out of foreign exchange and has been unable to find acceptable bank guarantees to consummate the transactions. Oil shortages are already harming the economy and seem likely to get worse as the summer progresses. Political unrest cannot be far away as fuel and food shortages mount. In the meantime the dispute with Ethiopia over the Grand Renaissance Dam which seems likely to block at least some of the Nile's water flowing into Egypt continues to grow. Some Egyptian politicians are already advocating military attacks on the dam site.

**Libya:** The struggle to maintain security continues as the government attempts to form some sort of national army or police force from the disparate, but well-armed militias who refuse to cede power after the uprising. In Benghazi on Sunday, mobs threw rocks at the headquarters of the militia alliance that has been designated an official part to the country's security. The militia responded with gunfire killing dozens of demonstrators who were seeking a real national army. The continuing instability does not bode well for the future of Libya's oil production. Several forecasters have said they see little potential for growth in Libya's oil production in the near future.

### **3. China**

Prospects for China's economy took a hit last week when new export statistics showed only a 1 percent increase in May down from 14.7 percent in April and way below the 20+ percent increase which has been the norm in recent years. Analysts have been suspicious of recent Chinese export statistics saying they did not mesh well with import statistics from China's trading partners. Some believe Chinese firms were overbilling as a means of importing capital which is under government restrictions.

The report comes amidst several other reports that China's economy is indeed slowing and raising questions as to the rate at which its imports of oil will continue to increase. China however, has increased its refining capacity in recent years and is in a good position to export oil products.

Ever increasing coal production during the last 40 years has been the key to China's economic miracle. With consumption now around 4.1 billion tons per year, China is reliant to coal for over half of its energy. With the increasing combustion of coal, however, have come ever increasing air, water, and soil pollution which reached totally unacceptable levels in Beijing and other major cities last January. Public outrage at the situation forced the new government to announce that it would make controlling pollution a high priority. Cutting coal consumption naturally conflicts with the nation's top priority of achieving 7-8 percent economic growth each year.

Last week, Beijing revealed the outlines of a new plan to drastically reduce coal consumption over the next two years. Coal use in the heavily polluted Beijing, Hebei, Tianjin region is to be cut by 100 million tons or roughly 25 percent by the end of 2015. The new plan is expected to ban expansion of high-polluting industries such as steel and cement near major cities and to reduce coal consumption by another 100 million tons in the industrial cities along the Pearl and Yangtze rivers. The government also announced a plan to build \$100 billion worth of ultra-high voltage power transmission lines that would facilitate moving power generation away from cities. This, of course, would take many years to implement.

Many observers are skeptical that Beijing can actually cut coal consumption, given the incentives to increase production on the part of local and industrial officials. The China Coal Industry Association says that coal consumption is still likely to hit 5 billion tons per year by 2020, and a new Wood-Mackenzie forecast says China's coal consumption is likely to hit 7 billion tons by 2030. If these forecasts are anywhere near correct, there are going to be a lot of people with respiratory problems in China, and the world's weather is going to get a lot worse.

## 4. Quote of the Week

- “On a planet with a rapidly changing climate, Canada should be figuring out now how to wind down carbon-intensive resource extraction. Otherwise we may soon find that we're producing masses of stuff we can't sell. But anyone who even hints at this idea in Canada is regarded as nuts. Any politician aspiring to national leadership who says such a thing can kiss his or her political career goodbye.”  
-- Thomas Homer-Dixon, University of Waterloo

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

- **Iraq's leaders** are trying to pull back from the edge of a political abyss, as sectarian violence escalated in April and May to levels the country has not seen in five years. Almost every major political figure in the country gathered in Baghdad on Saturday for a conference organized by the leader of the Islamic Supreme Council of Iraq. (6/3 #5)
- **China** already buys nearly half the oil that Iraq produces, nearly 1.5 million barrels a day, and is angling for an even bigger share, bidding for a stake now owned by Exxon Mobil in one of Iraq's largest oil fields. (6/3 #8)
- **Russia**, the world's biggest oil producer, increased monthly crude output by 0.3 percent in May to the highest level of the year, preliminary data show. (6/3 #12)
- Supreme Iranian leader Ayatollah **Ali Khamenei** delivered a sweeping speech here Tuesday morning in which he railed against what he described as foreign attempts to undermine the country's June 14 presidential election. (6/4 #7)
- **A delegation from India** said it will offer natural gas to help Sharif's government cope with an energy crisis. This will apparently be viewed as a “test case” for Pakistan's first democratically elected government. (6/6 #22)
- **In Turkey**, demonstrations have presented Prime Minister Recep Tayyip Erdogan with his worst political crisis in more than a decade of power. (6/4 #17)
- **Tokyo Electric Power** said on Tuesday it had detected radioactive cesium in groundwater flowing into its wrecked Fukushima Daiichi plant, reversing an earlier finding that any contamination was negligible. (6/4 #18)
- BP will spend at least \$1 billion to increase its **Alaska** drilling activity over the next five years, the company said Monday. (6/4 #20)
- **California state lawmakers** have introduced nearly a dozen bills that would curtail various aspects of fracking. In Shafter, where drilling is ongoing into the Monterey shale formation, at least two farmers have sued the state and oil companies over environmental damage. (6/4 #21)
- **In the United Kingdom**, the Institute of Directors released a report last month – “Getting shale gas working” - which said the UK's shale gas reserves could be “a new North Sea” boom for Britain “creating tens of thousands of jobs” in exploring and recovering the unconventional fuel. (6/4 #25)
- **China and Russia** joined four Western powers in pressing Iran on Wednesday to cooperate with a stalled investigation by the U.N. nuclear agency into suspected atomic research by the Islamic state. (6/5 #4)
- **NATO** is sending a team of experts to Libya to assess how the alliance can provide security assistance, notably military training, to help the turbulent North African nation combat Islamist militants claiming allegiance to Al Qaeda and other threats. (6/5 #9)

- **China** agreed on Tuesday to provide a \$1 billion credit line for the acquisition of ships and offshore equipment for Mexican state oil company Pemex. (6/5 #14)
- Independent analyses of **shale plays** throughout the US confirm that wells are short lived and reserves not as great as industry promises. Production numbers don't lie which makes them very inconvenient for industry to deal with once they are available. This is why operators begin to sell or joint venture assets once production can be verified. They, and their investment bankers, recognize that such disclosure can adversely affect share prices. (6/5 #20)
- **Norway's Statoil** recommended delaying one of its major oil projects in the Barents Sea, saying changes in petroleum taxes planned by the Norwegian government puts the viability of the development into question. (6/5 #24)
- **Gabon** is planning to take assets back from three international oil companies including a subsidiary of China's Sinopec in a sign of Africa's growing assertiveness as competition intensifies for its natural resources. The move will exacerbate tensions over a lack of clarity in the terms and conditions of investment as Gabon prepares to launch a licensing round for the deep waters off its coast. Experts say reserves in the Gabon Basin could rival deep offshore discoveries in Brazil. (6/6 #15)
- **Colombia** produced 1.01 million barrels of oil a day in May, a sharp rise from the same month of 2012 and little changed from the previous four months of this year. (6/6 #16)
- **Venezuela** has secured \$4 billion from China to be used for oil field development. The new funding from China will add to at least \$35 billion of credit Beijing has provided to Venezuela, mostly in return for future oil deliveries. (6/6 #17)
- After months of tensions between the **US and Venezuela**, Secretary of State John Kerry met with the Venezuelan foreign minister and announced the start of talks aimed at improving relations. (6/6 #8)
- **China** National Offshore Oil Corp. is partnering with Iceland's Eykon Energy in an application for a license to explore and produce oil and gas in Arctic waters offshore Iceland. (6/6 #20)
- **Canada's crude output** will more than double to 6.7 million barrels a day by 2030, with almost all the growth coming from Alberta's oil sands, the Canadian Association of Oil Producers said. Oil sands production will rise to 5.2 million barrels a day by 2030 from 1.8 million currently. (6/6 #25)
- **Libya** is moving the headquarters of its National Oil Company from Tripoli to Benghazi in the region where most of its oil is produced. The move will better integrate Libya's population among the various tribal groupings and improve supervision of the oil industry. (6/7, #8)
- The economic situation in **Venezuela** has become so bad that rationing is set to begin in the country's most populous state. Among the 20 items subject to controls are toilet paper and chicken. (6/7, #10)
- The **Sierra Club** is preparing to sue the Burlington Northern Railway for polluting the state of Washington's waterways. The club says that a recent study shows the average coal car loses some 3,500 pounds of coal dust per trip which ends up in the waterways. (6/7, #12)
- **France** is preparing to build two "smart" power substations that will receive, process data, and automatically adjust the configuration of the network according to supply, demand, and weather conditions. (6/7, #13)
- **African resentment** at heavy-handed Chinese exploitation of its minerals is growing. Ghana has arrested 168 Chinese for illegal gold mining, while Gabon is suing a subsidiary of Sinopac to recover assets. Trade between China and Africa is now over \$200 billion, up 20 fold in the last ten years as Beijing goes after Africa's mineral wealth in return for manufactured goods. (7/8, #6)

- The Nuclear Regulatory Commission has ordered safety upgrades to 31 US **nuclear power** stations as a result of the lessons learned from the Fukushima disaster. Southern California Edison will close its San Onofre Nuclear plant rather than face a lengthy political fight and make costly repairs. (7/8, #14,15)
- A new **Canadian report says** that claims by the Western oil provinces that they are losing billions in revenue due to the lack of pipelines are bogus. The reason the Canadians are getting \$40-50 less a barrel for tar sands “oil” is that is an inferior source of energy requiring much additional processing. (6/4, #24)
- **Michigan** is becoming concerned about the massive use of water for fracking. One new well will require 8.4 million gallons to frack which is much more than can be supplied by local water companies. (6/6, #24)
- **Pakistan** is suffering its most severe heat wave in decades as temperatures in parts of the country hit 124° F. There is no money to import fuel for the national power grid and the extreme heat is starting to damage food supplies. The new Prime Minister says his primary job is to restore the power.(6/5, #10)

## **Commentary:** Is it only a question of when the US once again becomes a net oil exporter?

By: Jeffrey J. Brown

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

In a recent Radio Free Europe/Radio Liberty interview with Daniel Yergin, the interviewer had the following rather remarkable question, “How will the fact that the United States is going from an oil importer to a net oil exporter change its foreign policy calculations?” The underlying premise--that the US would soon be a candidate for membership in OPEC--was not challenged by Mr. Yergin, and he talked about the implications of a steady increase in US and North American oil production.

Given the apparently widespread view that it is not if, but when, that the US becomes a net oil exporter, I thought that it would be a worthwhile exercise to examine the challenges facing the US oil and gas industry, as an ever greater percentage of US oil and gas production comes from very high decline rate oil and gas wells, especially in the context of what has been a post-2005 decline in Global Net Exports of oil (GNE).

ExxonMobil put the annual decline rate from existing wellbores in the 4%/year to 6%/year range a few years ago. For the sake of argument, let's assume that the decline rate from existing US oil wells was about 5%/year in 2008, when the US hit a recent low crude oil production rate of 5.0 million b/d. Of course, the 2005 Gulf Coast hurricane damage contributed to the 2004 to 2008 decline in production. In this paper, I am using the EIA's definition of crude oil, which is crude + condensate.

Let's assume that US crude oil production averages 7.5 million b/d in 2013, and let's make (in my opinion a conservative) assumption that the decline rate from existing US oil wells averages 10 percent/year over the next 10 years, as an increasing percentage of US production comes from high decline rate shale/tight plays.

At a 10 percent /year decline rate, in order to simply maintain a production rate of 7.5 million b/d out to 2023, the US oil industry would have to replace the productive equivalent of every single oil field in the United States of America--everything from the Thunder Horse Complex in the Gulf of Mexico, to the Eagle Ford Play, to the Permian Basin, to the Bakken Play to the North Slope of Alaska.

Or let me put it this way, at 5%/year decline rate, in 2008 the US lost 250,000 b/d per year due to declining production. At a 10%/year decline rate and a production rate of 7.5 million b/d, we would lose 750,000 b/d this year due to declining production.

In other words, a 50% increase in net production plus an increase in the decline rate from 5 percent /year to

10 percent /year would lead to a tripling in the volume of crude oil production lost every year due to production declines from existing wellbores.

Assuming an annual loss of about 750,000 b/d from existing wellbores, the gross increase in production would have to exceed 750,000 b/d in order to show a net increase in production. For example, let's assume that we average 7.5 million b/d in 2013, and let's assume that we lose 750,000 b/d from existing wellbores this year. In order to show a net increase of 0.25 million b/d from 2013 to 2014 (from 7.5 to 7.75 million b/d), the industry would have to show a gross increase in production of 1.0 million b/d, which would be the production from new wells in 2014 that were not producing in 2013.

In regard to the possibility of becoming crude oil self-sufficient, probably the simplest way to look at the US supply & demand situation is to focus on crude oil production versus refinery inputs.

Let's use the above assumptions, to-wit, annual US production of 7.5 million b/d in 2013, with an overall decline rate from existing wellbores of 10 percent/year. The decline rate will probably continue to increase, but for simplicity, let's assume that it averages 10 percent/year. As noted above, in order to maintain a constant 7.5 million b/d production rate out to 2023, given a 10 percent/year decline rate, we would have to replace the productive equivalent of 100% of current US crude oil production.

We are currently processing about 15 million b/d of crude oil in US refineries. A portion of the refined product is exported, and then we have refinery gains plus biofuels plus natural gas liquids, but let's ignore all of that and focus on crude oil production versus refinery inputs. Currently, we are producing about half of the crude oil inputs into US refineries, and importing the other half.

If we want to produce, in 2023, 100% of the crude oil that we currently process in US refineries, based on the above assumptions (especially a 10 percent /year decline rate), we would need to add the 7.5 million b/d, in order to offset declines, plus add another 7.5 million b/d over 10 years, for a total of 15 million b/d of new production, or about 1.5 million b/d per day per year for 10 years. And of course, once we reach the 15 million b/d level, assuming a 10%/year decline rate, we would need 1.5 million b/d of new production, every year, just to maintain the 15 million b/d production rate.

To meet the 1.5 million b/d per year rate, in order to be crude oil independent by 2023, in round numbers we would need to add--every single year--the combined current productive equivalent of the Bakken Play + the Eagle Ford Play. Or, we would need to add, over 10 years, the productive equivalent of the 2012 crude oil production from Saudi Arabia + Iraq + Kuwait.

This exercise illustrates why peaks happen, and it shows why production declines are inevitable. On the upslope of a production increase, new oil wells can offset the declines from existing wellbores, but with time, new oil wells can no longer offset the increasing volume of oil lost to production declines.

And of course the overall decline rate from existing US gas wells is almost certainly even higher than for oil wells.

We are currently averaging about 66 BCF/day (billion cubic feet per day) in dry natural gas production in the US (EIA). If we assume an overall 20%/year decline in natural gas production from existing wellbores, the industry would have to put online the productive equivalent of 100% of current US dry natural gas production over the next five years, in order to maintain a production rate of 66 BCF/day.

So, based on a 10%/year decline rate for oil wells and a 20%/year decline rate for gas production, in order to just maintain a crude oil production rate of about 7.5 million b/d and a natural gas production rate of 66 BCF/day, in round numbers the industry would have to add the productive oil equivalent of one new Bakken play every year and the productive gas equivalent of more than two Barnett Shale plays--every single year, year after year.

Globally, the dominant trend we are seeing is a post-2005 decline in Global Net Exports of oil (GNE), which I

define as the combined net oil exports from the top 33 net oil exporters in 2005, as the developing countries, led by China, so far at least have consumed an increasing share of a post-2005 declining volume of GNE. Of course, this means that developed net oil importing countries like the US have to make do with a declining share of a declining volume of GNE. And the US is still dependent on imports for about half of crude oil processed in US refineries. The post-2005 decline in GNE, combined with increasing demand from developing countries were, in my opinion, the primary factors that contributed to global annual (Brent) crude oil prices more than quadrupling from \$25 in 2002 to \$112 in 2012.

Currently rising US crude oil production is very important, but in all likelihood we will see a continuation of the “Undulating Decline” pattern that we have seen in US crude oil production since it peaked in 1970--set against the backdrop of what will probably be a continuing pattern of developing countries, led by China, consuming an increasing share of a smaller post-2005 supply of Global Net Exports of oil.

In fact, recently released EIA data confirm a continuation of a pattern that we have seen since 2002, to wit, China and India have been consuming a steadily increasing share of GNE. At the 2005 to 2012 rate of decline in the ratio of GNE to China and India’s combined net oil imports, in only 17 years China and India alone would theoretically consume 100% of global net exports of oil.

For more information on Global Net Exports of oil, following is a link to my recent paper on the Export Capacity Index concept.

For a concrete example of how the Export Capacity Index (ECI) concept works, consider two countries that are widely considered to be critically important sources of future crude oil production: Brazil and Iraq. If we extrapolate the 2008 to 2012 rate of decline in Brazil + Iraq's combined ECI ratio (the ratio of liquids production\* to consumption), they would collectively approach zero net oil exports in about 20 years.

Given Brazil’s status as a net oil importer in 2012, even if we count biofuels, it’s instructive to consider what the conventional wisdom was just a few years ago regarding Brazil. In April, 2009 Bloomberg published a column discussing the prospect for Brazil continuing “to take market share away from OPEC.”

We should keep case histories like this in mind when we read in the media about the “Fact” that the US will soon be a net oil exporter, and while there are always uncertainties in forecasting future trends, we can be certain of three objective facts: (1) All oil fields, sooner or later, peak and decline; (2) Global crude oil production is the sum of discrete oil fields that peak and decline and (3) Given an ongoing production decline in an oil exporting country, it is a mathematical certainty that unless domestic consumption in that oil exporting country falls at the same rate as the rate of decline in production, or at a faster rate, the resulting net export decline rate will exceed the production decline rate and the net export decline rate will accelerate with time.

\*EIA data, production = total petroleum liquids + other liquids (mostly biofuels in the other liquids category)

### **The Export Capacity Index (ECI): A New Metric For Predicting Future Supplies of Global Net Oil Exports**

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

April, 2009: **OPEC Cuts Thwarted as Brazil, Russia Grab U.S. Market**

<http://www.bloomberg.com/apps/news?pid=newsarchive&sid=aiSCDyK4CWml&refer=news>

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