



PEAK OIL REVIEW

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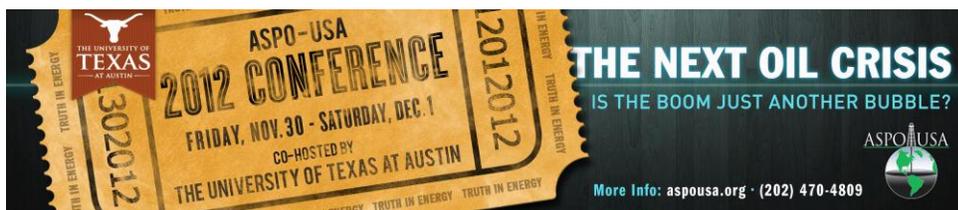
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1. Oil and the Global Economy

Oil prices jumped about two dollars on Tuesday as Turkish-Syrian tensions increased, but remained relatively steady for the rest of the week with Brent closing down \$1 on Friday at \$114.62 a barrel and NY down to \$91.86. The IEA's new forecast of slightly lower oil demand for 2012 and 2013 helped send prices down on Friday. The IMF now is forecasting that world economic growth will be only 3.3 percent this year and 3.6 next year, adding to the pressure. Europe continues to grapple with the Greek and Spanish debt problems amid growing concerns that another global recession is in the offing.

The weekly US stocks report showed crude inventories increasing by 1.7 million barrels but product inventories falling, with gasoline inventories down by 500,000 barrels to the lowest level in four years. Distillate inventories declined by 3.2 million barrels as the EIA issued warnings about the adequacy of heating oil supplies for the coming winter. Accuweather released a forecast of cold and snow in the northeast this winter.

US natural gas futures climbed all week, setting a 2012 high above \$3.60 per million on a combination of forecasts for a normal winter, lower than expected injections of gas into storage, less drilling, and increasing consumption by electric utilities. The US natural gas inventory is now 6.8 percent higher than this time last year – a big decline from the 57 percent above normal that was registered at the end of March. The large surplus seen in the spring has been eaten away by a hot summer and lower natural gas production.

2. The Middle East

It was an active week in the region with fighting in Syria taking place close to the Turkish border and Ankara responding forcefully to the occasional shell that fell on its territory. The headline event of the week came when Turkish fighters forced down a Syrian airliner coming from Russia with what were apparently spare parts for Syrian air defense radars. The Turks have now banned Syrian aircraft from transiting their country. In the meantime, fighting in Syria appears to be on the rise with the rebels threatening to cut the road between

Aleppo and Damascus. The US has sent 150 military personnel to Jordan to help deal with the increased flow of refugees.

The IEA reports that Iranian oil production has now fallen to 2.85 million b/d, the lowest in level in 23 years. Despite brave words, threats, and exhortations from the Ayatollah, the sanctions appear to be having an effect on the Iranian economy. Last week Tehran was forced to bring all trading in foreign currencies under state control to prevent further deterioration of its currency. Tehran blasted the UN's IAEA that has been inspecting its nuclear facilities, suggesting that it may break or downgrade relations with the Agency in retaliation for the sanctions. The west is blaming Tehran for recent cyber-attacks on Saudi Aramco's computer systems and corporate computers in the US.

The EU reached a preliminary agreement to further tighten economic sanctions on Tehran as Washington released new restrictions. The sanctions appear to be having a larger impact than Tehran is willing to admit. An increasing number of foreign companies are cutting ties to Iran because of the growing complexity of trade deals and the fear that they may be banned from doing business in the sanctioning countries. The extent of Iran's troubles was revealed this week with a new report from a marine intelligence firm saying that only 980 vessels called at Iranian ports in the first nine months of this year as compared to 3,407 in 2011. The situation with container, refrigerator, dry bulk cargo, and fishing ships is even worse with port calls down about 75 percent. Tehran has started to implement an "economy of resistance" under which vital foodstuffs are being stockpiled.

Israeli Prime Minister Netanyahu has called for new elections early next year. Polling shows that he should win easily leaving him in a stronger political position to take action against Tehran should it become necessary.

3. IEA Reports

Last week, the International Energy Agency in Paris released its annual *Medium Term Market Report* which contains projections for the next five years as well as its monthly *Oil Market Report*. The monthly report downgraded the forecast growth of global oil consumption in 2012 from 800,000 to 700,000 b/d, but kept the forecast for 2013's growth at 800,000 b/d. The Agency notes that OECD inventories are growing despite lower Iranian exports and various other reductions in the Middle Eastern oil exports. The IEA's analysts see a paradox in the increase in US crude stocks and the fall in US product inventories. While various refinery outages are part of the problem, increasing exports of petroleum products to markets outside of the US and EU are becoming part of life in the oil industry.

The *Medium Term Market Report* is one of the more interesting documents the IEA has released in recent years for it grapples with forecasts of what will happen to global oil production and consumption in the next five years. The conclusions are surprising in that the Agency sees OECD demand growth falling, spectacular increases in oil production and falling prices between now and 2017 – provided the Middle East does not degenerate into export-reducing turmoil.

The Agency sees global demand for oil rising to 95.7 million b/d in 2017 vs. 2011's demand of 89.0 million. Nearly all of this increase in demand will come from non-OECD countries in Asia and the Middle East as the next five years are seen as times of economic stagnation for the industrialized world. China's oil demand is forecast as growing at 2.5 percent a year during the next five years – well down from the roughly 7 percent seen during the past decade.

It is the supply side of the equation that comes as a surprise for the Agency sees total productive capacity (production increase plus increase in spare capacity) growing by 1.5 million b/d each year to 102 million b/d for an increase of 9.3 million b/d. This, of course is in contrast with most estimates from the peak oil community that see global production leveling out somewhere between 90 and 95 million b/d.

The 9.3 million b/d increase is forecast to come from a combination of increased US tight oil production; increased Iraqi production; increased Canadian oil sands production; and more natural gas liquids and

biofuels. Deep-water production is forecast to grow from 5.2 to 8.2 million b/d or 8 percent of global production by 2017.

While the Agency is careful to note the uncertainties and dangers of the various Middle Eastern conflicts, this is one of the most optimistic baseline forecasts it has issued for several years. The report waxes ecstatic about the “formidable power” and the “technological revolution” of fracking for tight oil. A lengthy section on US tight oil production discusses many of the factors that will play a role in future production, but fails to discuss the rapid depletion rates of fracked wells and the need for frequent re-drilling to maintain production that many in the peak oil community have been noting for many months.

However, the 134 page report discusses many important topics bearing on future oil production in depth. Among those of interest is the IEA’s concern that the global demand for diesel/gasoil is growing much faster than the industry can meet demand. Shortages of this most versatile fuel are already appearing and the situation can only get worse in coming years. Another topic of interest is that the Agency is starting to pay attention to the issue of “net exports,” where oil producing countries are consuming a greater share of their production domestically, leaving less oil for export to the industrialized world. In the Middle East, consumption is expected to grow at a compounded 3.4 percent per year for the next five years, far exceeding the increase in production from the region.

4. Fuel prices

The California gas price spike seems to have peaked with regular hitting an all-time high of \$4.67 a gallon last Monday. California’s governor ordered an immediate switch to the cheaper and easier to make winter blends, normally not sold until October 31st so that by week’s end regular gasoline was selling for an average of \$4.61.

The next fuel spike may be for heating oil in New York where there are low inventories and a new requirement that heating oil meet the same low-sulfur requirements that diesel trucks have had for several years. Refinery closures have cut the supply of legal heating oil to a third below that of last year. Only 6 percent of US homes use heating oil and most of these are in the northeastern US.

Quote of the week

- "Since 2005, China and India have consumed an increasing share of a declining volume of oil exports... If we extrapolate current trends, China and India alone would consume 100% of global net oil exports by 2030."

- [Jeffrey Brown](#), ASPO-USA Vice-President

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

- **China** could become a new oil product exports powerhouse if all planned projects for refining capacity expansion in the country go ahead, the International Energy Agency said. (10/13, #14)
- **Iraq's** oil output is to more than double by the end of the decade and by the 2030s it will be the world's second-largest oil exporter after Saudi Arabia, according to an in-depth study by the International Energy Agency. (10/9, #10, #11)
- Chinese oil companies are showing a growing interest in Iraq's oil industry as **Beijing** widens its global hunt for mineral resources. (10/12, #13)
- Shell said the majority of the oil spills in the **Niger Delta** were the result of acts of sabotage. Nigerian farmers and the Dutch division of Friends of Earth are suing Shell for environmental damage caused by oil spills in the Niger Delta. (10/11, #8) (10/12, #14)
- Noble Energy executives said that oil production in the Falkland Islands could begin in about six years if an exploration well proves to be successful. (10/12, #15)

- Some of the world's biggest oil companies and traders are poised to **export** substantial amounts of crude from the US for the first time in decades. Shell, BP and Vitol are among the six companies known to have applied to the US government for export licenses. (10/12, #17, #18)
- US imports of light, sweet crude oil - mostly West African - will fall to virtually zero by 2014 as rising domestic shale oil production and refinery closures sap demand. The US is now pumping more than a million b/d of tight oil and the hydrocarbons produced are similar to top quality grades produced in Africa. (10/12, #19)
- **Pennsylvania** announced it issued a permit for the construction of a power plant that would run partially on domestic shale gas. The permit paves the way for construction of the first plant in the state to run on natural gas produced in the Marcellus shale play. (10/12, #21)
- **Danish** North Sea oil output fell 19 percent in September compared with the same month in 2011, a huge drop stemming from a prolonged shut down for maintenance in the mostly mature fields. (10/12, #24)
- The **Saudi** oil minister said the state-owned energy company made a natural gas discovery about 15 miles offshore in the Red Sea. The field, near the port of Dhuba, produced around 10 million cubic feet per day during an initial testing at a depth of 17,700 feet. (10/11, #4)
- **Saudi Arabia's** oil minister said his country has the ability to meet existing and future demand for oil. Ali al-Naimi told reporters that the kingdom now pumps around 10 million barrels a day, and said its production capacity of more than 12 million barrels is sufficient to meet any demand. (10/10, #7)
- The oil industry sued to overturn a **US** rule requiring companies to report their payments to foreign governments to develop oil and gas fields, arguing the information would provide valuable secrets to competitors. (10/11, #15)
- Canada is focusing its attention on India and other Asian countries as it seeks to reduce its dependence on the US for exports of hydrocarbons, according to the country's Minister of Natural Resources Joe Oliver. (10/11, #16)
- An oil field in the Celtic Sea may prove to be a game changer for **Ireland**, possibly producing enough to make the country self-sufficient or even turning it into an oil exporter. (10/11, #18)
- The Supreme Court refused to consider **Chevron's** bid to block collection of a \$19 billion Ecuadorean environmental judgment against the company. (10/10, #11)
- **India** said there is a fear of natural gas production becoming commercially unviable at Reliance Industries's key oil and gas producing fields in the eastern offshore Krishna-Godavari basin if the output continues to decline. (10/10, #12)
- **Chevron** said a fire-damaged crude-processing unit at Richmond, California refinery won't resume production before the end of the year. (10/10, #13)
- Iraq is quietly shipping supplies of fuel oil to **Syria** in a deal that has triggered concern in Washington and exposes Damascus's difficulties keeping its economy afloat in the face of a growing civil war and economic sanctions. (10/9, #12)
- Oil producers in the Middle East and North Africa plan to invest \$740 billion on energy projects in the next five years, led by **Saudi Arabia**. High oil prices will allow them to resume projects that were delayed at the height of the financial crisis. (10/8, #7)

- Saudi Arabian Oil Co. increased the number of supertankers it hired to haul oil to the US. The company chartered at least seven very large crude carriers to carry about 14 million barrels in October, compared with about four a month so far this year. (10/8, #8)
- The World Bank has cut its forecast for growth in **China's** economy this year to 7.7 per cent, a sharp downgrade from the prediction of 8.2 per cent growth it made in May. (10/8, #15)
- The US's EPA urged a federal appeals court to reject requests by industry groups to reconsider an earlier ruling that upheld the agency's right to use the Clean Air Act to curb greenhouse gas emissions. (10/13, #16)
- Two European insurers have withdrawn coverage for tankers involved in the Iranian oil trade, the first such move since tough new sanctions were imposed in July. The tankers, operated by Hong Kong's Titan Petrochemicals Group Ltd, were used to store Iranian oil. (10/12, #10)
- The US drilling rig count fell 2 units during the week ended Oct. 12, with the total number of rotary rigs reaching 1,835, Baker Hughes Inc. reported. This compares with 2,023 rigs working in the comparable week last year. (10/13, #19)

Commentary: Energy Transition: We need to do it fast and we're way behind

By Kurt Cobb

Note: This article originally appeared September 30 on Kurt Cobb's blog, [Resource Insights](#). It is the fifth of a six part series that ran in The Christian Science Monitor to introduce their readers to key concepts and ideas on energy and resource issues. To read additional installments of this series click on the following: [Part 1](#), [Part 2](#), [Part 3](#), [Part 4](#), [Part 6](#).

No doubt you've heard people speak of an energy transition from a fossil fuel-based society to one based on renewable energy--energy which by its very nature cannot run out. Here's the short answer to why we need do it fast: climate change and fossil fuel depletion. And, here's the short answer to why we're way behind: [History suggests that it can take up to 50 years to replace an existing energy infrastructure](#), and we don't have that long.

Perhaps the most important thing that people don't realize about building a renewable energy infrastructure is that most of the energy for building it will have to come from fossil fuels. Currently, 84 percent of all the energy consumed worldwide is produced using fossil fuels--oil, natural gas and coal. Fossil fuels are therefore providing the lion's share of power to the factories that make solar cells, wind turbines, geothermal equipment, hydroelectric generators, wave energy converters, and underwater tidal energy turbines. Right now we are producing at or close to the maximum amount of energy we've ever produced from fossil fuels. But [the emerging plateau in world oil production](#), [concerns about the sustainability of coal production](#), and [questionable claims about natural gas supplies](#) are warnings that fossil fuels may not remain plentiful long enough to underwrite an uneven and loitering transition to a renewable energy society.

This is what's been dubbed the rate-of-conversion problem. In a nutshell, is our rate of conversion away from fossil fuels fast enough so as to avoid an unexpected drop in total energy available to society? Will we be far enough along in that conversion when fossil fuel supplies begin to decline so that we won't be forced into an energy austerity that could undermine the stability of our society?

The answer can't be known. But the numbers are not reassuring. Based on data from the U.S. Energy Information Administration, it would take more than 70 years to replace the world's current electrical generating capacity with renewables including hydroelectric, wind, solar, tidal, wave, geothermal, biomass

and waste at the rate of installation seen from 2005 through 2009, the last years for which such data is available. And, that's if worldwide generating capacity--which has been expanding at a 4 percent clip per year--is instead held steady.

This also doesn't take into account the amount of energy actually produced versus what is called nameplate capacity. Nameplate capacity is what a wind generator could generate if it operated at maximum capacity 100 percent of the time. But in practice, the turbines are only spinning when the wind blows and then not always at the maximum speed. This so-called capacity factor was [just 27 percent for wind farms in the United Kingdom from 2007 to 2011 \(PDF\)](#). For solar photovoltaic the number was 8.3 percent. Even hydroelectric stations ran at only about 35 percent of capacity. This compares to about [42 percent for conventional coal, 61 percent for natural gas, and 60 percent for nuclear power stations \(PDF\)](#). The contrast is starker using U.S. numbers: [72 percent for coal and 91 percent for nuclear using 2008 figures, though natural gas was only 11 percent, probably because these were primarily plants that only come on to meet peak demand and so don't run very often. \(PDF\)](#)

What this means is that installing two to three times our current nameplate capacity in the form of renewables may be required to replace existing fossil-fueled plants. So, the transition period would actually turn out to be longer than what I've calculated, perhaps 140 to 210 years using 2005 to 2009 installation figures. Of course, installations of such renewables as wind and solar are accelerating. So, that would tend to shorten this longer transition period--as would leaving existing nuclear power capacity intact. But would we be able to shorten the transition period enough to head off declines in total energy production and prevent additional serious damage to the climate?

Of course, some would say that we need to expand nuclear power generation rapidly to meet these challenges. Whether you support such an expansion or not, there are three key problems. First, building enough nuclear power stations to replace fossil fuel-fired plants would be the largest construction project ever undertaken and require the use of enormous amounts of fossil fuels. Making the necessary concrete alone would be a large new contributor to greenhouse gas emissions. That means that the initial phase of a nuclear transition would actually *increase* the rate of fossil fuel emissions. The savings on fuel and emissions wouldn't come until much later.

Second, after the Fukushima disaster, there doesn't seem to be much appetite for such a buildout. I'll be very surprised if nuclear power generation even maintains its current level in the next 20 years as Japan and Germany abandon nuclear power. Third, the timeline for such a buildout would be measured in decades, partly because of the sheer logistics involved and partly because of the brake that regulatory approvals put on such projects. Even new, cheaper and easier-to-build designs may not help if they cannot achieve the necessary regulatory approvals promptly. The history of such approvals is not encouraging. The safest thing a nuclear regulatory agency can do is say no.

I haven't even touched on replacing the fuels which power our transportation system and provide heat for our buildings and industrial processes. Transportation offers an extraordinary challenge since [80 percent of all transportation fuel worldwide is still derived from petroleum](#). In the United States [the number is 93 percent](#). Despite billions of dollars spent and decades of research, we still have no good substitutes that scale to the size necessary to replace petroleum for transportation fuel.

Biofuels offer little hope. Already the ethanol bubble has burst. Biofuels--today mainly ethanol and biodiesel--compete with food. There is simply not a limitless supply of suitable farmland, and so there will be competition with the demand for food until we find substitutes for the industry's main feedstocks, namely corn, sugar and soybeans.

Beyond this the problem of scale is simply unsolvable. To supply the entire U.S. car fleet--assuming it could run on ethanol--[we'd have to plant 1.8 billion acres in corn for ethanol continuously](#). There are only about 440 million acres in the United States in cultivation now. And, it's worth noting that current methods of corn cultivation require the copious use of herbicides and pesticides made from oil; tractors and other

vehicles that run on oil to plow, harvest and spray the fields as well as transport the crop; and natural gas-derived nitrogen fertilizers to boost growth and replenish depleted soil. Fossil fuels are currently integral to growing corn, and I cannot see the wisdom of growing *organic* corn for anything but food.

As for heat for buildings, certainly we could insulate and seal our existing buildings better. And, this points the way to achieving an energy transition within the time we need to achieve it. Since it will probably be impossible to scale renewable energy fast enough to a level sufficient to produce the amount of energy we use today, the one absolute necessity to a successful energy transition is reducing consumption drastically. No politician dares to say anything remotely approaching this. And yet, it would be the cheapest, fastest way to address the twin crises of fossil fuel depletion and climate change.

Now, when I say reduce, I mean on the order of 80 percent over the next 20 to 30 years. For Americans this may seem impossible until they contemplate that the average European lives on half the energy of the average American. So often we hope for technological breakthroughs that will give us all the clean energy we desire. But we ought to focus equally, if not more, on using our prowess to find ways to reduce our energy consumption drastically. This is actually the much easier road. When we are made conscious of our energy use, we can change our behavior quickly to modify it without compromising the quality of our lives. As more homes and businesses are given the means to monitor their energy use, the people in them will change to lower their consumption and costs.

Already we know how to build so-called [passive design](#) structures which can lower energy use by 80 percent. And, we desperately need to figure out how to apply these techniques cheaply and economically to *existing* homes and businesses. In transportation we need to stop thinking that cars equal transportation and instead realize that cars provide the *service* of transportation which can be obtained in a number of ways, many of which use much less energy

We may also need to speed the energy transition in electric power generation using so-called [feed-in tariffs](#). These tariffs--which harness the ingenuity of countless small producers--have enabled Germany to expand solar, wind and other alternatives so that they generate 25 percent of its electricity today. Germany, not a particularly sunny place, is currently the world's top generator of solar electricity. Of course, per person energy consumption in poor countries is only a small fraction of that in rich countries. We cannot expect the world's poor to reduce their energy use by 80 percent. Instead, we must help them to move quickly beyond fossil fuels to renewable energy.

By simultaneously reducing consumption and encouraging a rapid buildout of renewable energy, it is possible that we could mitigate the problem of declining fossil fuel supplies before it becomes so acute that it would cripple that very buildout. And, we could address climate change at the same time. Certainly, there are difficult problems to be solved with renewable energy, storage being the key one. Most renewable energy comes in the form of electricity, and since there is often a mismatch between the time we produce that electricity and the time we need it, we will have to master storage.

But we will need a lot less storage if we focus on reducing consumption. This is the one strategy which will allow us to overcome the rate-of-conversion problem and achieve an energy transition in far less time than we have in the past.

Kurt Cobb is the author of the peak-oil-themed thriller, [Prelude](#), and a columnist for the Paris-based science news site [Scitizen](#). He is a member of the ASPO-USA Board of Directors. His work has also been featured on *Energy Bulletin*, *The Oil Drum*, *321energy*, *Common Dreams*, *Le Monde Diplomatique*, *EV World*, and many other sites. He maintains a blog called [Resource Insights](#)