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Author Name:

Dr Mamdouh G. Salameh
Director
International Oil Economist
World Bank Consultant
UNIDO Technical Expert

World Bank, Washington DC / Oil Market
Consultancy Service
Spring Croft
Sturt Avenue
Haslemere
Surrey GU27 3SJ
United Kingdom
Tel: (01428) – 644137
Fax: (01428) – 656262
e-mail: mgsalameh@btconnect.com

affiliated to
CCI PARIS ILE-DE-FRANCE

ESCP Europe Business School,
527 Finchley Road, NW3 7BG, Hampstead, London, United Kingdom.
http://www.escpeurope.eu
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About the Author

Dr Mamdouh G. SALAMEH
International Oil Economist
Consultant, Oil & Energy, World Bank, UK

Dr Mamdouh G. Salameh is an international oil economist, a consultant for the World Bank in Washington D.C. on oil and energy and also a technical expert with the United Nations Industrial Development Organization (UNIDO) in Vienna. He holds a PhD in Economics specializing in the economics & geopolitics of oil and energy. Dr Salameh is also a visiting professor of energy economics at the ESCP Europe Business School in London.

Dr Salameh has presented papers to numerous international energy conferences on the economics and geopolitics of oil and energy and has been frequently invited to lecture on these topics at universities around the world. He has written three books on oil: **"Is a Third Oil Crisis Inevitable?"** (published in London in April 1990), **" Jordan's Energy Prospects & Needs to the Year 2010: The Economic Viability of Extracting Oil from Shale"** (published in London in October 1998) and " **Over a Barrel"** (Published in the UK in June 2004) as well as numerous research papers published in international Oil and Energy Journals. Dr Salameh has undertaken research assignments for the US Department of Energy, the World Bank, the Institute of Energy Economics in Japan, the Indian Government, OPEC, the Canadian Energy Research Institute, Boston University working on the Encyclopedia of Energy and also the Handbook of Energy and the government of Jordan among others. He regularly appears on TV to discuss oil prices and other developments in the global oil market.

Dr Salameh is a member of many International Institutes and Associations including the International Association for Energy Economics (IAEE) in the US, the British Institute of Energy Economics, the International Energy Foundation in Canada, the International Institute for Strategic Studies (IISS) in London, and the Royal Institute of International Affairs (RIIA) in London. He is also an advisor to the Oil Depletion Analysis Centre (ODAC), London.

Is the United States Really the World's Top Crude Oil Producer or is this a Figment of BP's Imagination?

By
Dr Mamdouh G Salameh*

The BP Statistical Review of World Energy, the International Energy Agency (IEA) and the Financial Times are three of a kind. The three of them represent the major consumers of oil (particularly western consumers) and, therefore, have a tendency to exaggerate global oil reserves, production and discoveries and reduce global demand for oil in a blatant attempt to intimidate the oil price but the global oil market has seen through their ploys.

For their data, BP Statistical Review relies on published figures from third party sources (which are usually bloated and highly political). Iran is a case in point. Since 2010 BP Statistical Review has been reporting that Iran has proven reserves of 157 billion barrels (bb) when two retired National Iranian Oil Company's (NIOC) experts: The late Dr Ali Samsan Bakhtiari and Dr Ali Muhammed Saidi estimated Iran's proven reserves at no more than 36 bb-37 bb. The late Dr Bakhtiari who worked with NIOC for 36 years in a variety of senior positions until his retirement, once went on record saying that Iran is running out of oil and its proven oil reserves are closer to 36 bb. He made that reality crystal clear to Iran's leaders a few years ago when he told former Iranian president Ahmadinejad that Iran's proven oil reserves are closer to 36 bb instead of the then official figure of 137 bb. **1**

BP is doing it again. The 2015 issue of BP Statistical Review claims that the United States has overtaken both Saudi Arabia and Russia in 2014 to emerge as the world's top crude oil producer with an average daily production of 11.64 million barrels a day (mbd) in comparison with 11.51 mbd for Saudi Arabia and 10.84 mbd for Russia. **2**

It's a headline that's as attention-grabbing as it gets. News outlets the world over pounced on data produced by BP that says the US made the jump sometime during 2014. "We are truly witnessing a changing of the guard of global energy suppliers," BP Chief Economist Spencer Dale said in a presentation, according to a report from Bloomberg. "The implications of the shale revolution for the U.S. are profound." **3** As with anything, however, there are some caveats to be aware of and a handful of reasons why the recent headlines may be a tad misleading.

One has to recognize that BP has substantial US investments, and this may colour its view on the future of US oil production. Downbeat assessments don't do anything for stock prices. It is also possible that BP is trying to improve its public image in the United States in the aftermath of the Gulf of Mexico's disaster and the ongoing court cases against it in the US.

First off, calling the US the world's top oil producer is inaccurate and also misleading. BP includes natural gas liquids (NGLs) which may not qualify as crude oil and condensates in its crude oil count. **4**

Related to that is the fact that America's uptick in production is going to be a temporary measure —won't be able to keep the wheels spinning as fast as they have forever, and the cyclical nature of the industry will eventually call for a slowdown. In fact, they are already seeing it happen. Many companies have been forced to close up shop, scale back production dramatically, and lay off thousands of workers because of the steep decline in oil prices since last year. **5**

The Washington Post recently ran an article detailing the economic pains those layoffs are bringing to a subsection of the economy that grew to depend on those well-paying oil jobs. According to the article, 17,000 oil and natural gas jobs evaporated in the month of May alone, and now many of those workers are struggling to find other work. **6**

In 2014 US crude oil production amounted to 8.71 mbd of which 4.2 mbd came from tight oil resources and 0.14 mbd from lease condensates. This compares with 10.1 mbd for Russia and 9.70 mbd for Saudi Arabia. This means that Russia and Saudi Arabia were once again the world's number one and number two crude oil producers including lease condensate (which is defined as oil) whilst the United States came third (see Table 1).

Table 1
Comparative Crude Production Figures of the US
Russia & Saudi Arabia
(mbd)

Year	Russia	Saudi Arabia	United States
2014	**10.10**	**9.70**	**8.71**

Sources: US Energy Information Administration (EIA) / OPEC Annual Statistical Bulletin / Resources Insights.

The discrepancy between BP's figures on the one hand and those of OPEC and EIA on the other are significant enough so as to beg the question about how BP is defining oil (see Table 2).

Table 2
US Crude Oil Production* as Reported by BP, OPEC & EIA
(2010-2015)
(mbd)

	2010	2011	2012	2013	2014	2015
BP Statistical	**7.56**	**7.86**	**8.90**	**10.07**	**11.64**	**N/A**
OPEC	**5.47**	**5.65**	**6.48**	**7.44**	**8.70**	**N/A**
EIA	**5.48**	**5.64**	**6.50**	**7.46**	**8.71**	**9.43**

Sources: BP Statistical Review of World Energy, June 2015 / OPEC Annual Statistical Bulletin 2014 / EIA.

It turns out that oil according to the BP definition includes NGLs which come from natural gas wells and include such things as ethane, propane, butane and pentanes. It also includes lease condensate--very light hydrocarbons that come from actual oil wells and are included in the oil refinery stream.

Production of natural gas plant liquids in the United States has grown rapidly as a result of increasing production of shale gas. These liquids are useful, but they are not oil and only displace oil in a minor way. Moreover, their energy content is around 65% that of crude oil and so counting barrels of natural gas plant liquids as equivalent to oil is doubly misleading. **7**

The second question media outlets should have asked is whether natural gas plant liquids can be sold as oil on the world market. The answer is a resounding "no”. In fact, major exchanges accept neither natural gas plant liquids nor lease condensates as satisfactory delivery for crude oil. And, if we subtract lease condensate from each country's total, US production will be actually lower. It turns out that US wells now produce a higher proportion of condensate as a result of growth in oil extraction from shale deposits (which tend to be rich in these condensates).

And if major exchanges don’t accept natural gas liquids as crude oil, then they are not crude oil or as a well-known Texan oilman, Jeffrey Brown, pointed out: “If what you're selling cannot be sold on the world market as crude oil, then it's not crude oil”. The implications are fairly obvious: The world has substantially lower oil production than widely believed, and growth in world oil supplies has slowed considerably in the last several years. Using the BP definition of oil, world production in 2014 was 88.7 mbpd. **8** Using the stricter definition of crude oil including lease condensate, the number was 77.8 mbd. Big difference indeed!

Growth in oil supplies according to BP from 2005 through 2014 was 8.2%. **9**
Using the stricter definition, growth was 5.4 %, which is down from 15.7% for the previous 9-year period.

So, BP and the oil industry have one definition when referring to oil supply--one designed to create a rosy picture of the future--but must bow to the market's definition when they actually want to sell oil to somebody. Who would you accept as the better authority on what constitutes oil, the buyers or the sellers?

All this is not to deny that oil production in the United States is rising, and has been doing so rather quickly. But, this must be put in context. First, although the United States produced 9.6 mbd of oil for the week ending June 5 according to the EIA, it had net imports of 6.2 mbd. For comparison, OPEC reports that Saudi Arabian oil production as of May 15 was 10.3 mbd. **10**

Second, even the EIA expects US oil production (crude oil including lease condensate) to decline after 2020. This implies that the United States will continue to be a large importer of crude oil. One independent analysis based on actual well performance suggests that the EIA long-term projections are probably far too optimistic. American production may not remain near current levels for very long and, in fact, may drop considerably in the next two decades.

The current slump in oil prices has many believing that supply will continue to be ample in the long run. But, we ought to consider that oil production in the United States may be nearing its peak and that all of the production growth in oil worldwide has come from two countries: the United States and Canada. That should make us more cautious about projecting the triumphant pronouncements of BP very far into the future.

The Saudis Claim Victory over US Shale Oil

Among the many arguments the Saudis used to justify their refusal to cut production to arrest the slide in oil prices was their intention to slow down US shale oil production if not kill it altogether.

Citing the 60% drop in the US oil rig count since October 2014 and the slowing US oil production, they are claiming a brilliant victory. **11**

But rather than kill the US shale oil revolution, the Saudis have only made it more resilient, sped up its rate of technological innovation and capped oil prices for the near future.

US shale oil producers will survive and grow. American consumers, paying less for gasoline and heating oil are the big winners. Already crude oil's plunge has fuelled a big jump in US petrol demand. **12** The Saudis and their allies in OPEC, so dependent on the oil-export revenues, are the clear losers.

The US shale industry is by necessity becoming more efficient than ever. Low oil prices have become an opportunity. The Saudis have prompted US shale oil producers to trim the fat and zero in on the most productive technologies.

Shale's Break-even Price

Just a year ago, the break-even price for US shale oil production was estimated at $70-$85/barrel. Popular opinion seemed to be that shale oil production was generally unprofitable if oil prices fell below $80 per barrel. This break-even point was lower in some formations and far higher in others. But with prices well above $100/barrel, producers and oil service companies were simply racing to drill as many wells as possible.

However, weak global demand turned the oil market on its head overnight. Suddenly, investors saw a market awash with oil with little economic growth to sponge it up. Prices fell and the Saudis made their gamble. Instead of cutting their production and persuading their OPEC partners to cut with them to prop up prices, they reasoned that US shale oil production and other high-cost output like Canadian tar sand oil and Brazil's deep offshore, couldn't compete if prices were to fall into the $50 range for any extended period. They assumed the $80 break-even price for US shale oil was a firm floor. They also underestimated American innovation and ingenuity that has created the first shale oil revolution. They were wrong on both counts.

For the US shale oil producers, the steep decline in the oil prices was a shock, but then came the response. Spending on new production was reined in. Contracts were re-negotiated with oil service companies, reducing the cost of equipment and only the best drilling and fracking crews were retained.

Statoil, for example, reported that just in a few months it cut its drilling time for new wells in Texas' Eagle Ford shale formation from 21 days to 17. That kind of efficiency gain has helped shale drillers reduce the cost of drilling a well from $4.5 million to $3.5 million. **13**

Other companies are experimenting with new fracking fluids and different types of sand to create better shale-rock fractures. Some are effectively incorporating sophisticated data to better locate the sweet spots of geological formations and optimal well-spacing to increase productivity. The result is a rapid decline in the break-even price across shale plays. Already analysts believe it is now $60 per barrel and before long it could even fall to will fall to $50. **14**

It has been tempting to assume that the shale oil boom is over, that a fall in the rig count and a small dip in US crude production signify that the high-water mark of US shale oil has come and gone. But as the Saudis are finding out, US shale oil drillers are just in the early innings of a second shale oil revolution and this new revolution is here to stay.

Footnotes

1 Mamdouh G Salameh, "**Oil & Iran Nuclear Programme**" (A USAEE Working Paper Series Number: 09-036 posted on 29 December 2009).
2 BP Statistical Review of World Energy, June 2015, p. 8.
3 A report by Bloomberg on what BP Chief Economist Spencer Dale said in a presentation launching the 2015 issue of the BP Statistical Review of World Energy in London.
4 Sam Becker, "**The US Is Now the World's Top Oil Producer**" posted on Google on June13, 2015.
5 Ibid.,
6 Ibid.,
7 Kurt Cobb, "**No, BP, the US Did Not Surpass Saudi Arabia in Oil Production**", published by Resources Insights on 14 June, 2015.
8 BP Statistical Review of World Energy, June, 2015, p. 8.
9 Ibid.,
10 Kurt Cobb, "**No, BP, The US Did Not Surpass Saudi Arabia in Oil Production**".
11 Mark J. Perry, "**Saudis' Drive to Kill US Shale Has Backfired**", May 26, 2015, Investors' Business Daily.
12 Ed Crooks & Gregory Mayer, "**Crude's Plunge Fuels Jump in US Petrol Demand**", Financial Times, 16 January 2015, p. 28.
13 Mark J. Perry, "**Saudis' Drive to Kill US Shale Has Backfired**".
14 Ibid.