

Fracking: A Revolution of the World Energy Market in the Making?

Martin Beck

News:

The US will probably become the largest oil producer in 2014. Will that lead to an end of the dependence on Middle Eastern oil?

Summary:

Fracking is a recent and sophisticated technology that enables the exploitation of specific oil sources—in the form of oil shale—that until recently had been considered uncommercial. Since the bulk of oil shale is to be found in the Americas and oil fracking in the US is booming, a debate emerged on whether fracking could revolutionize the global energy system, particularly in terms of American energy autonomy and independence from the Middle East. The present article puts forward strong arguments contradicting such a far-reaching thesis.

Key Words

Oil, Fracking, USA, OPEC, Saudi Arabia

Analysis:

On January 9th 2014, Richard Spencer of the British daily “Telegraph” predicted a fundamental change in the global oil market and the US liberation of “its foreign policy from dependency on a handful of oil-rich Arab allies.”¹ Richard Spencer did not advance an isolated view. Rather, he echoed a perspective spread by an institution not less important or influential than the US National Intelligence Council. In its 2030 forecast, the National Intelligence Council predicted that fracking could result in US energy independence in the next two decades, which could mean that “OPEC could lose price control and crude oil prices would drop, possibly sharply.”²

Thus, it is fair to ask: Is a revolution of the world energy market in the making? The last one happened nearly fifty years ago when in the early 1970s control of production and price setting shifted from the major Anglo-Saxon oil companies to the oil states, the most important of which cooperate with the Organization of the Petroleum Exporting Countries (OPEC). It will be argued in the following that skepticism about such a far-reaching assessment appears to be appropriate.

Hydraulic fracturing—or fracking—is a technology which had already been developed in the 1940s. A mixture of water, sand and chemicals is injected with high pressure into oil shale so it fractures the rock in a way that enables the extraction of gas and oil. Recently developed combinations of horizontal drilling with hydraulic fracturing facilitated the exploitation of oil shale that was previously considered as commercially useless.³

The development of fracking has actually revolutionized the debate on oil that had been dominated by the idea of “peak oil” (and related to that: energy transition away from hydrocarbons) until recently. Insofar as fracking contributed to the postponement of a fundamental change of the energy mix, the role of oil—and the power related to it—has been strengthened rather than weakened by the American fracking boom. In other words, insofar as fracking reduces the need to promote alternative energy sources, it also strengthens the role of those who control oil resources. Yet, who are those who control oil resources?

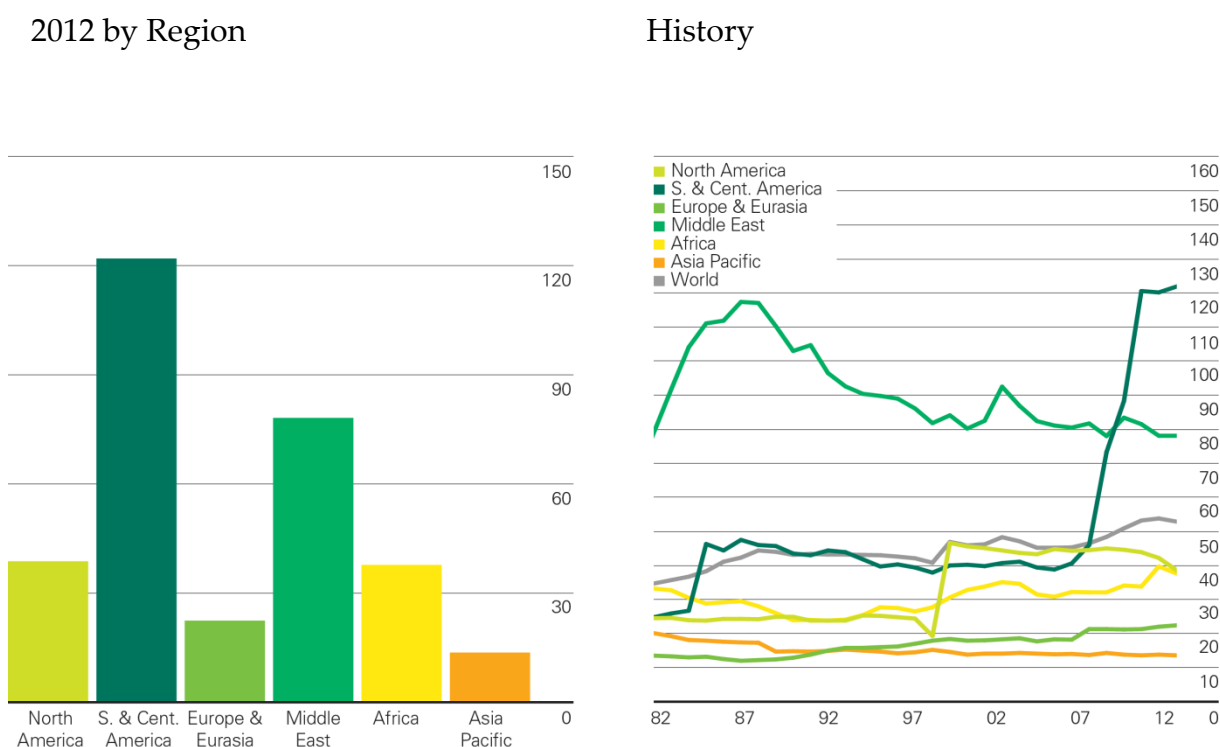
¹ The Telegraph: Fracking Boom Frees the US from Old Oil Allies, January 9, 2014; available at: <http://www.telegraph.co.uk/earth/energy/oil/10476647/Fracking-boom-frees-the-US-from-old-oil-alliances.html>.

² National Intelligence Council: Global Trends 2030. Alternative Worlds, December 2012, p. 36; available at: <http://info.publicintelligence.net/GlobalTrends2030.pdf>.

³ Ibid, p. 37.

Despite the oil shale boom in the Americas, the Middle East controls nearly 50% of the world's proven reserves, North America less than 15%. The difference becomes even more drastic if one focuses on individual countries: Saudi Arabia has 16% of all proven reserves, the US only 2%.⁴ Thus, how can it be that the US oil production might surpass the Saudi production in 2014? The reason is that North America and the Middle East show very different patterns of reserves-to-production ratios, as a look at table 1 illustrates.

Table 1: Reserves-Production Ratios



Source: British Petroleum 2013: Statistical Review of World Energy 2013; available at: <http://www.bp.com/en/global/corporate/about-bp/energy-economics/statistical-review-of-world-energy-2013.html>.

The Middle East produces significantly below its share of its proven reserves, whereas the opposite holds true for the US.⁵ Since this imbalance has been significant ever since the discovery of oil in the Middle East, it challenges the as-

⁴ British Petroleum 2013: Statistical Review of World Energy 2013, p. 6; available at: <http://www.bp.com/en/global/corporate/about-bp/energy-economics/statistical-review-of-world-energy-2013.html>.

⁵ Nota bene that the high reserves-to-production ratio of South and Central America is a result of the huge Venezuelan reserves that were added to the proved reserves in the first decade of the 21st century.

assessment that Middle Eastern oil power will dramatically diminish when the US outperforms Saudi oil production in the coming years. Ever since the oil revolution of the 1970s the comparatively low oil production of the Middle East in general and Saudi Arabia in particular is an indicator of strength rather than weakness. Why so?

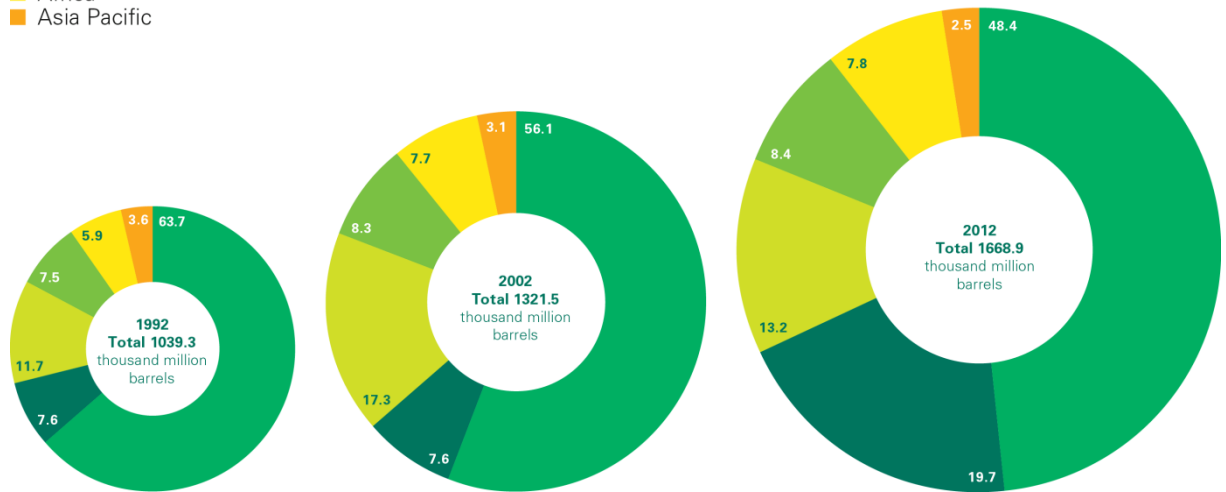
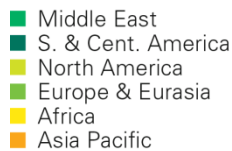
Oil production costs in Saudi Arabia specifically and in the Gulf in general are among the lowest worldwide. According to serious estimates, production costs in the Gulf range between 1.5 and 8 US dollars per barrel; in average they are below 5 US dollars.⁶ Thus, according to the market logic, the Gulf States should produce far above its current level since production costs in North America are much higher. However, this would reduce the oil rent of Middle Eastern oil producers. The Gulf States enjoy a very high rent income due to the huge gap between oil prices and production costs of their fields. At the same time, they prefer high rent income to profits since high rents are at the free disposal of the recipient, whereas the bulk of profits must be reinvested in order to achieve an income in the future. The high ratio of reserves to production in the Middle East is partly unintended (such as in the case of Iraq as a result of war damages and political instability) but partly also intentional, i.e. the result of efforts to control production in order to keep oil rents high (as in the case of Kuwait and Saudi Arabia).

Since the 1970s, members of OPEC whose leading actors—with the exception of Venezuela—are Middle Eastern countries have mostly been acting as residual world suppliers, thereby keeping the oil rent up. By doing so, they had to deal with a complex dilemma situation in a cooperative way: members of OPEC are unified in keeping the oil rent high; at the same time, they have an interest in increasing their individual production to boost their individual rent income at the expense of all other members of OPEC. Thus, if OPEC members acted according to their short-term individual rationality, OPEC production would significantly increase—and prices and the oil rent decrease. Also from this angle it becomes clear that a high market share of OPEC should not be confused with its position of power in the global energy market.

As a glimpse at table 2 shows, proven reserves strongly *increased* in the period between 1992 and 2012, and particularly so between 2002 and 2012:

Table 2: Distribution of Proven Oil Reserves in 1992, 2002 and 2012

⁶ Jean-François Seznec 2008: The Gulf Sovereign Wealth Funds. Myths and Reality, in: Middle East Policy 15.2, p. 99.

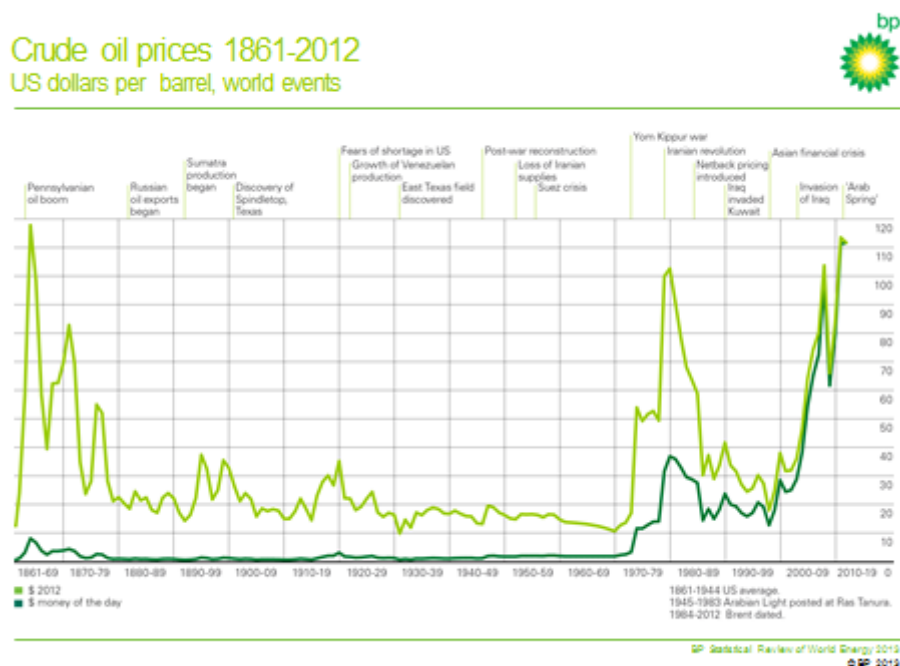


Source: British Petroleum 2013: Statistical Review of World Energy 2013; available at: <http://www.bp.com/en/global/corporate/about-bp/energy-economics/statistical-review-of-world-energy-2013.html>.

Since oil is a non-renewable energy source, there is much less oil available today than ten or twenty years ago. Yet, the term “proven reserves” refers to the idea of oil reserves that are exploitable in commercial terms. Thereby, the significant increase of proven oil reserves in the first decade of the 21st century is the result mainly of two factors: Firstly, as mentioned above, the availability of the advanced fracking technology. Secondly, however, high oil prices have also contributed to this outcome. Estimates of production costs per barrel produced with the fracking technology vary between 70 and 85 US dollars. Possibly, these costs may be reduced to 50 to 60 US dollars in the foreseeable future.⁷ Yet, as the graph of historical price development in Table 3 shows, even the lowest estimation of production costs of 50 US dollars are far above the level of real oil prices of the 1990s.

⁷ MIT Technology Review: Energy News: Shale Oil Will Boost U.S. Production, But It Won't Bring Energy Independence, November 15, 2012; available at: <http://www.technologyreview.com/news/507446/shale-oil-will-boost-us-production-but-it-wont-bring-energy-independence/>.

Table 3:



Source: British Petroleum 2013: Statistical Review of World Energy 2013; available at: <http://www.bp.com/en/global/corporate/about-bp/energy-economics/statistical-review-of-world-energy-2013.html>.

Thus, if oil prices had not dramatically increased in the first decade of the 21st century, oil encapsulated in oil shale would not count today as proven reserves. Moreover, oil as produced by fracking is only lucrative if and as long as oil prices remain significantly above the level of the 1980s and 1990s. Therefore, although fracking certainly puts some pressure on OPEC members in terms of market shares, it also partially disburdens Saudi Arabia and the other major oil producers of OPEC from doing the job of keeping up the prices on their own. In that way, American oil production based on the fracking technology contributes to keeping up the oil rent of the Gulf States—which is their major source of power.

Moreover, American oil as produced by fracking will not lead to long-term energy independence. Despite an increase of American proven reserves relative to the Middle East in recent years, the American reserves-to-production ratio is still much lower than in the Middle East. Thus, if there are no breakthroughs in technologies that could replace oil (rather than increasing Western oil production by expensive technologies), the world market share of the Gulf will increase.

There are basically two likely scenarios: The global market share of the Gulf will either increase in the short or in the long run. The first scenario would oc-

cur if the pressure on OPEC members would be too high and their members decided to regain market shares by cutting prices below the level of production costs of American oil as produced by the fracking technology. The second scenario would turn into reality if OPEC reacted flexibly to the American production by further reducing its own production. Both scenarios imply that fracking is not a technology that contributes to Western energy independence.

Author

Martin Beck is Professor at the Center for Contemporary Middle East Studies at SDU (see www.sdu.dk/staff/mbeck). Currently, the Arab Spring is his major research area.