



The Big Deal About U.S. Energy Self-Sufficiency

Posted by [aeberman](#) on October 31, 2012 - 5:23pm

Mark J. Perry caused a minor sensation on October 22, 2012 when he posted a blog about record-breaking fossil fuel production in the United States. Perry is an economics professor at the University of Michigan at Flint and a visiting scholar at the American Enterprise Institute. His blog is titled as an economics and finance website but a great deal of content is about energy.

In "U.S. fossil fuel production will reach all-time high this year; America's energy self-sufficiency will be highest since 1990" (<http://www.aei-ideas.org/channel/carpe-diem/page/2/>), Perry shows a stunning graph of U.S. fossil fuel production (coal, natural gas and crude oil) from 1975 to 2012 (Exhibit 1).

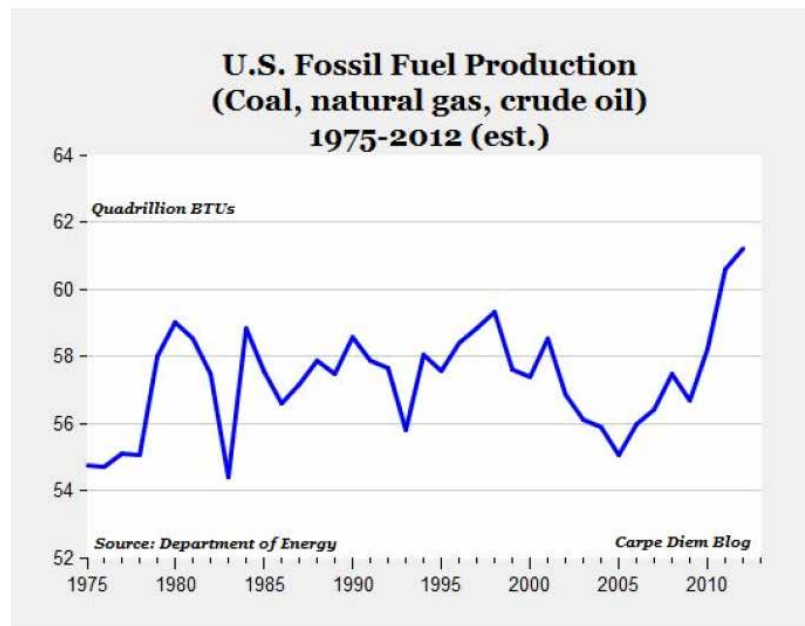


Exhibit 1. U.S Fossil Fuel Production. Source: Mark J. Perry.

I was able to reproduce his graph using EIA data but I had to include natural gas plant liquids to make it match. When I plotted this data on a more conventional y-axis scale, the enormity of the anomaly shrinks to what it really is, namely an increase in overall fossil fuel production within a narrow range of fluctuation over three-and-a-half decades (Exhibit 2).

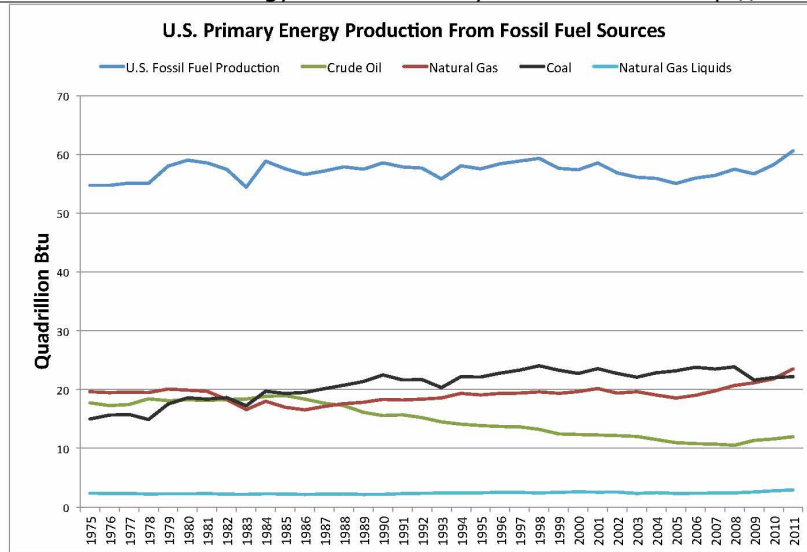


Exhibit 2. U.S Energy Production From Fossil Fuel Sources. Source: EIA.

2011 fossil fuel energy production was 1.3 quadrillion British thermal units (Quads) higher than the previous peak in 1998 with 60.6 Quad in 2011 and 59.3 Quad in 1998. The EIA reports comparative energy production in Quads to normalize the various measures of its components: cubic feet for gas, barrels for crude oil and natural gas liquids (NGL), and short tons for coal. A Quad is a measure of the heat content of those energy sources when burned. Exhibit 3 shows how this conversion is made.

Exhibit 3. Quad conversion Table. Source: EIA.

One Quad is approximately equal to 1 trillion cubic feet of gas, 180 million barrels of oil, 120 million barrels of NGL (about 65% of the thermal content of crude oil), and 36 million short tons of coal.

Exhibit 4 shows the various components of total fossil fuel energy at a scale appropriate to understanding which sources increased and decreased over the period of the graph.

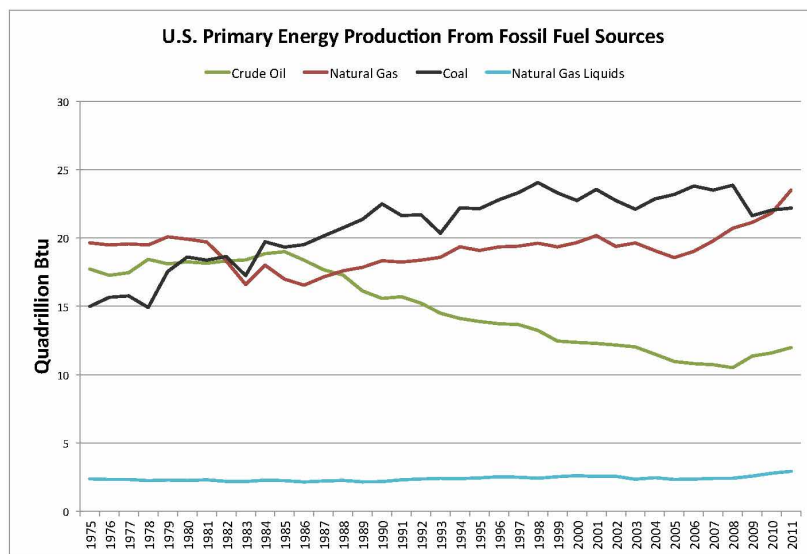


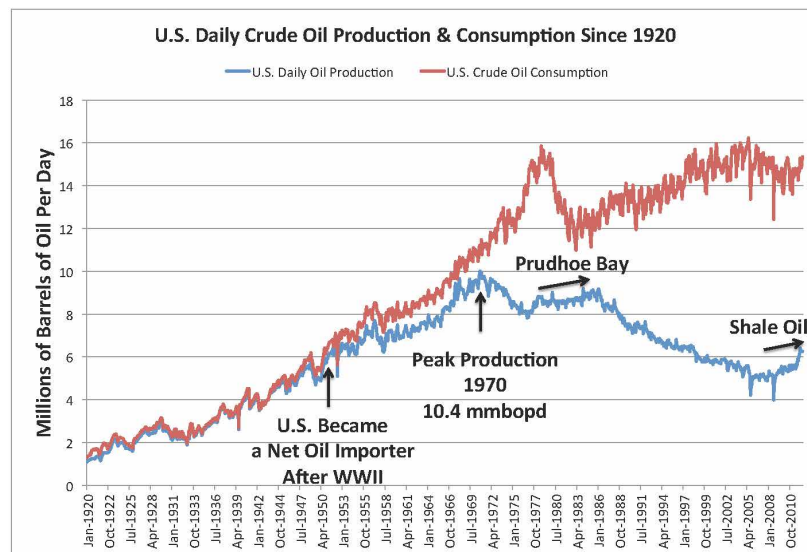
Exhibit 4. U.S Energy Production From Component Fossil Fuel Sources. Source: EIA.

Comparing 1998 with 2011 production, coal decreased by about 184,000 tons per day, natural gas increased a whopping 11 billion cubic feet per day (bcf), crude oil decreased almost 605,000 barrels per day and NGLs increased approximately 160,000 barrels per day (Exhibit 5).

Exhibit 5. 2011 vs 1998 Fossil Fuel Component Comparison Table. Source: EIA.

Dr. Perry celebrates the success of the shale revolution in his blog calling it "a big deal." He points out that the U.S. is closer to energy self-sufficiency than at any other time in the past 22 years. But the problem for the U.S. is not total energy. We have always had an abundant endowment of coal and natural gas. The problem is liquid fuel for transport and that comes from crude oil. The shale revolution in oil that he describes is notable and important but it only returns production to 2003 levels which were lower than at any time after 1951.

There is nothing untrue in Perry's blog but it, unfortunately, contributes to the distorted viewpoint that the U.S. will soon become energy independent and will no longer need to import foreign oil. The U.S. has used more oil than it produces since records were kept in 1920 but became a true net oil importing country after World War II (Exhibit 6).

*Exhibit 6. US Crude Oil Production and Consumption Since 1920. Source: EIA.*

After production peaked in 1970, not even the discovery of Prudhoe Bay, the largest oil field in the U.S. (12.8 billion barrels produced to date), brought production back to the 1970 peak. Including the recent increase from shale oil, the gap between production and consumption is approximately 9 million barrels of oil per day, almost as much as 1970 peak production.

I am encouraged by the slight reversal in U.S. oil production but see no way that we will become oil independent. The star performer in total fossil fuel production is natural gas. While it is true that gas offers the possibility of replacing crude oil refined products as a transport fuel, this will be decades in the future (massive equipment changes and distribution infrastructure) and does not address the near- to medium-term problem of oil imports. Curiously, nowhere in his blog about

economics and finance does Perry discuss the cost and profitability of shale gas or shale oil. Rather than write so much about energy, a subject outside of his training and experience, it would be useful if he wrote about the economics of the shale developments that he is so exuberant about. That would be a big deal.



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