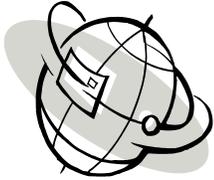


# **Energy Issues**

## *IEP Newsletter*



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### ***Hello from your new President***

*By: Walter Bright, PE, PEM*

It is with great pleasure that I introduce myself as the new President of the Institute of Energy Professionals. I have already met a few of you and I look forward to meeting and working with the many of those I have not yet been fortunate enough to meet. Dan Mull (Director Emeritus) has grown IEP into an excellent training program and resource, and I look forward to continuing that tradition. Over the next few newsletters, I plan to introduce some initiatives IEP will be taking to better serve its members. For now, I thought I would provide a short bio of my background.

As the son of a small general contractor, I typically spent the summers on the jobsite during my childhood. My dad was an energy enthusiast and started exclusively building ENERGY STAR Certified Homes, many of which he convinced the owner to allow him to install solar domestic HW systems as well. After graduating from North Carolina State University with my Master of Science in Mechanical Engineering, I stayed and worked in the Energy Management Program (EMP) under the direction of Dr. Stephen Terry and Dr. Herb Eckerlin. There, we performed no to low cost energy assessments for commercial and industrial clients, while using students to help train the next generation of energy engineer.

Through a research adventure while with EMP, I came by my next career in Building Automation at Engineered Control Solutions (ECS). ECS is a well-known and respected Authorized Integrator for Honeywell, Distech and other Building Automation Systems. There I was on the "front lines" of energy management, helping implement several performance contracts and ECMs, as well as designing controls for a variety of facilities, including schools, data centers, water treatment plants and others.

With the experience of being a contractor, I decided to enter the A&E world, accepting a job at Dewberry Engineers. There, I have designed jobs in the healthcare and research/lab sectors for a variety of clients. Now, I have the privilege of being the President of IEP, serving a membership base which spans over 30 countries and over 20 US states.

It is with great honor I continue the tradition IEP has had. While maintaining the current training programs and resources (like this newsletter), I look forward to growing the program's offerings. That said, if you have ideas or needs IEP might be able to fulfill, please don't hesitate to contact us. In an effort to meet everyone, I'll be reaching out to people at random as they renew their certification.

I look forward to talking with you all soon.

## *Has the US Become Energy Independent?*

*By: Thomas D. Mull, PE, PEM, CEM*

For as long as most of us can remember, the United States has been the primary global consumer of fossil fuels. Recently, growing economies such as China and India have dramatically increased their consumption to become major players in the global energy market.

The US is believed to have the largest reserves of coal in the world. Natural gas is essentially a domestic energy resource, with approximately 88% of the country's annual requirement coming from within. It would appear then the only impediment to energy independence would be the sufficient supply and refining capacity for crude oil. Note: The contribution by nuclear, wind and solar are a consideration, but a topic for another discussion.

For the foreseeable future the world's economies are directly linked to fossil fuels, especially crude oil. Industry, aviation, shipping and ground transportation rely heavily on crude oil and its products. The supply and distribution of oil, therefore, are a major interest to all countries. To illustrate this one only needs to look at recent events in the Persian Gulf and how markets have responded.

### Global Oil Exports:

The supply side of the oil equation is in a constant state of flux, with some countries regulating production to maintain a preferred price level. In addition, embargos placed on selected countries have limited their availability to the world market, with shortfalls being made up by others. According to *Investopedia*, as of October 2018 the top ten global exports of crude oil by percentage were:

Saudi Arabia	15.90%	Iran	4.80%
Russia	11.10%	Kuwait	4.50%
Iraq	7.30%	Nigeria	3.90%
Canada	6.40%	Angola	3.60%
UAE	5.90%	Kazakhstan	3.20%

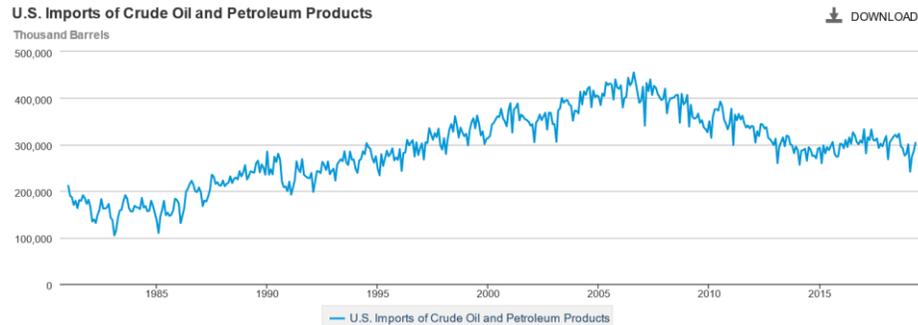
*Top 10 Global Crude Oil Exporters Oct. – 2018*

These countries represent nearly 67% of the crude oil exported. Missing from this list was Venezuela, which has historically been a significant exporter. It is worth noting that 38.4% of the global exports were from the Persian Gulf, a politically volatile area.

### USA Imports vs. Exports:

The USA has been a major importer of crude oil since the 1960s, with its peak in August 2006 when it imported 455,695 thousand barrels of crude and petroleum products. Since that point, importation has steadily decreased, as shown in Graph 1 – US Oil Importation 1983-2019.

*Has the US Become Energy Independent?* (continued)



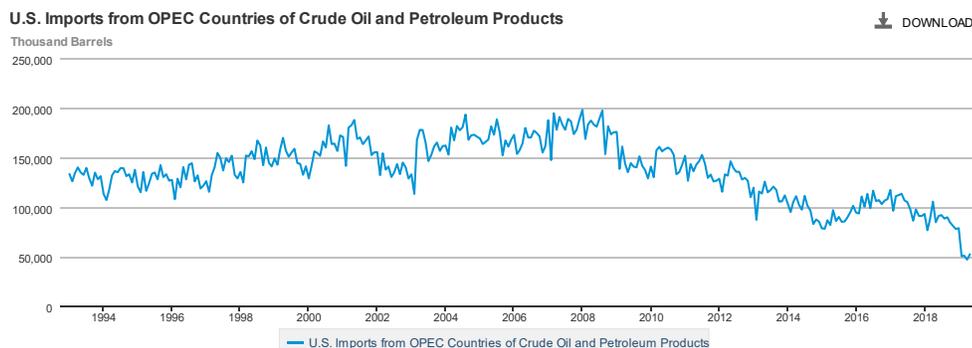
Source: U.S. Energy Information Administration

Graph 1 - USA Oil Importation 1983-2019

In the month of May 2019, the USA imported 303,887 thousand barrels of crude oil and petroleum (refined) products. Of that amount 17.3% (52,468 thousand barrels) came from OPEC countries, with Saudi Arabia being the largest contributor with 14,334 thousand barrels. It is worth mentioning that only 9.3% (28,264 thousand barrels) came from the Persian Gulf area.

Non-OPEC countries made up 82.7% (251,419 thousand barrels) of imports. Canada was the largest contributor with 137,166 thousand barrels (45.1% of the May total). Columbia, a non-OPEC country, provided 14,218 thousand barrels nearly as much as Saudi Arabia.

The Graph 2 below highlights the downward trend in US imports from OPEC over the past ten plus years.

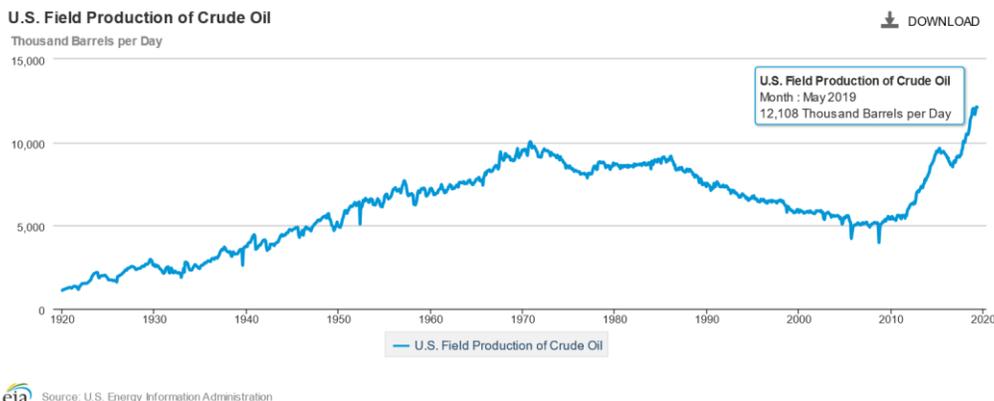


Source: U.S. Energy Information Administration

Graph 2 - USA OPEC Oil Importation 1993-2019

Correspondingly, with the decline in overall oil importation there has been an increase in US production (See Graph 3 - US Crude Oil Production 1993-2019). In 2010 US fracking operations began to have a notable impact on domestic supply. In May 2019 domestic production was at an all-time high of 12,108 thousand barrels per day. This equates to approximately 375,300 thousand barrels for the month.

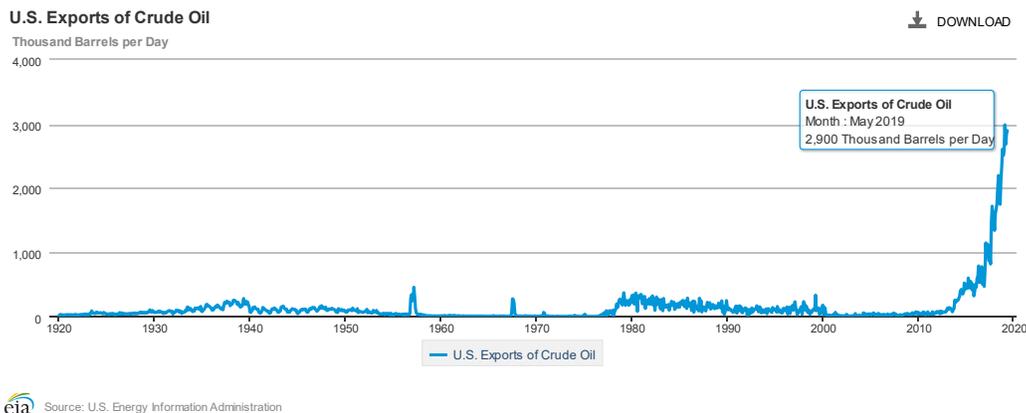
*Has the US Become Energy Independent?* (continued)



Graph 3 - US Crude Oil Production 1993-2019

For the 12-month period ending with May 2019, US production averaged 11,644 thousand barrels per day. For the same 12-month period an average of 9,620 thousand barrels of oil per day were imported, resulting in a total supply of approximately 21.26 million barrels of crude per day. US oil consumption for 2018 (latest data available as of this writing) was 20.46 million barrels per day. Assuming similar usage for the 12-month period ending with May 2019, the US would have had a surplus.

Historically, the US has been a minor exporter of oil. However, starting in late 2013 there was a dramatic upswing in exports. In 2018 the average US monthly export of crude oil was 2,002 thousand barrels per day. In May 2019 2,900 thousand barrels per day were exported, on par with countries such as Brazil.



Graph 4 - US Crude Oil Exports 1920-2019

Summary:

So, where does the US stand in its quest for energy independence? Certainly, with respect to coal and natural gas a case can be made that the US does not have to rely on distant countries for fundamental needs. Nuclear power and renewable energy sources continue to make a meaningful contribution to the country’s energy portfolio. With respect to crude oil, both production and exports have increased while imports have dramatically decreased.

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### *Has the US Become Energy Independent?* (continued)

In 2018 the US consumed 20.46 million barrels of oil per day. With US production in May 2019 at a new high of approximately 12.11 million barrels per day, it would appear importation will be required until such time other energy sources (nuclear and renewables) offset the differential. Or, crude oil production and refining capacity\* is increased sufficiently to meet domestic requirements. The trend, however, is undeniable. The US is reducing its reliance on other countries and moving towards becoming energy independent.

*\* The US lacks sufficient refining capacity to meet domestic needs. While there have been expansions and several small refineries constructed, there has not been a new major refinery (>100,000 barrels/day) constructed in the US in over 40 years.*

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### *Increased US Production Aids Global Oil Price Stability*

*By: Staff Writer*

With the September 14, 2019 targeted attacks of Aramco's storage and production facilities at Abaqaiq and Khurais, Saudi Arabia, the global supply of oil was reduced by 5.7 million barrels per day. This is equivalent to about 5% of global output. Initial responses were speculative and pessimistic, with some projecting that oil prices would increase to \$100 per barrel or more. The reality is somewhat different.

One suggested reason for the attacks was to drive up the price of oil. Countries dependent upon oil as their primary export (i.e., source of income) have seen revenues drop dramatically with lower prices. Econ 101 tells us with decreased global supply the price of oil should go up. Had this occurred twenty or more years ago, there would likely have been a significant increase in the price of oil. Today, however, conditions are markedly different.

In October 2018 the price of WTI crude was over \$70 per barrel. By mid-July 2019 it was in the low \$50s per barrel. As of September 19, 2019, the WTI price quoted by Bloomberg was slightly over \$58 per barrel (Brent crude ~\$64.50 per barrel). As noted in previous Newsletter articles the price of crude has been highly volatile, fluctuating between \$50 and \$70 per barrel over the past few years. So, with a 5% decrease in global supply why hasn't there been a dramatic increase in the price?

While the US still imports oil and refined products, their production has increased to the point they are exporting oil at an increasing rate. This additional production has contributed to the global supply. And price stability, at least in the short term.

If, however, tensions in the Middle East increase and the global supply is further impacted price escalations will occur. They will impact all industrialized nations, but most notably those highly dependent upon imported oil.

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