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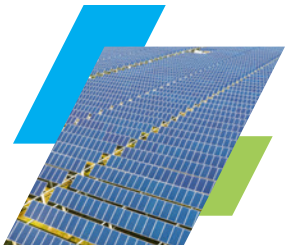
Pennsylvania Independent Oil & Gas Association

JUST THE FACTS

Can the U.S. Meet its Electricity Demand with 100 Percent Renewable Energy?

The debate over the issue of "100 percent" renewable energy, with the use of no oil, natural gas, coal or nuclear power sources for electricity, is the subject of considerable discussion today, and will continue to be well into the future. A look at the facts about a number of limiting factors with renewable sources points to the need for an "all-of-the-above" policy for decades to come to meet our demand for electricity, as well as for heating and transportation fuels. Here is what a few independent researchers concluded on the limitations of renewables:



Land Use

Solar installations and wind farms require the use of huge amounts of land, especially when compared to the amount of land needed for an on-demand natural gas-fed electric generating facility. Data from a 2018 Harvard University study found that achieving 100 percent renewable energy sources to meet U.S. need for electricity would require one-third of the country's total land mass to be dedicated to solar and wind facilities.

From a land-use efficiency perspective, research by Strata Policy concluded that the production of wind energy requires 70.64 acres of land per megawatt generated, while solar sources require 43.5 acres per megawatt. By comparison, natural gas-fired power plants require only 12.41 acres per megawatt. While efficiencies for all three sources are likely to improve into the future, it is inconceivable that either solar or wind would be able to match the efficiency of natural gas.

Intermittency

The common expression, "the sun sets and the wind stops blowing" is borne out in the fact that those energy sources are and will continue to be intermittent and unable to meet demand 24 hours and day, 365 days a year. According to the Energy Information Administration, wind turbines in the U.S. perform at 34.6 percent of their nameplate rating and solar units perform at 25.7 percent of their nameplate rating.

At the other end of the demand spectrum are natural gas and coal units that can perform at 85 percent or more of their nameplate ratings and nuclear units that can perform at over 90 percent of their nameplate rating.

Looking into the future, natural gas will continue to meet the need for on-demand electricity, with many facilities currently able to reach 100 percent of their generation capacity in 30 minutes, a period that will only get shorter with technological advances.

Cost and Subsidies

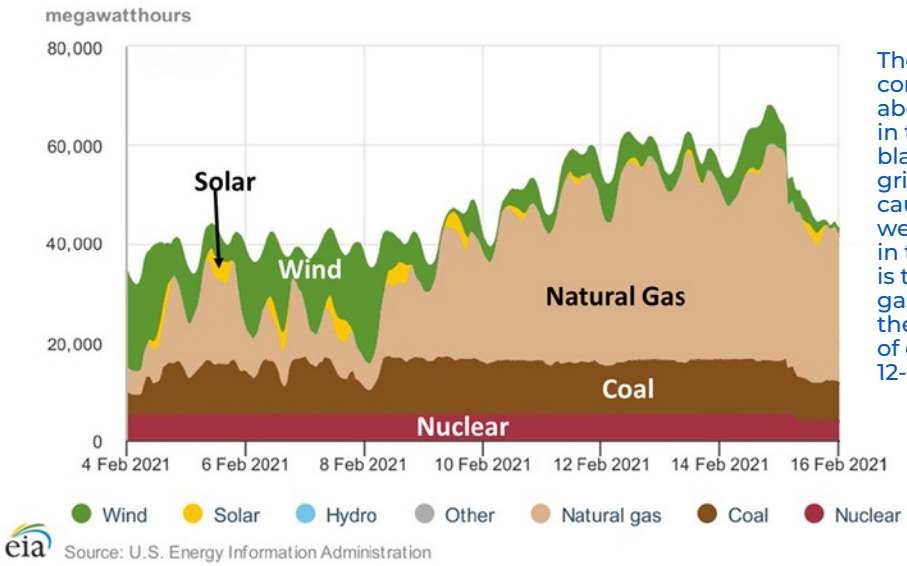
Warren Buffet stated in a 2014 Wall Street Journal article, “we get a tax credit if we build a lot of wind farms. That’s the only reason to build them. They don’t make sense without the tax credit.”

The fact is that renewable energy sources are made more competitive with government assistance. The U.S. subsidizes wind with the production tax credit and solar power with the investment tax credit. In addition, individual states subsidize renewables by forcing utilities to invest in them or purchase their power.

Negative cost implications from governments placing a heavy emphasis on renewable sources can be found here and abroad: Germany and Denmark have been world leaders in wind and solar investment. Between 2006 to 2016, prices of electricity in Germany increased 51 percent. Electricity prices in Denmark have doubled since 1995. Here in the U.S., California generated 23 percent of its electricity from wind and solar sources in 2017 and its residential electricity rates were 18.24 cents per kilowatt-hour, at least 40 percent higher than any other state in the western U.S.

This is just a sampling of the limitations of renewable energy sources and the challenges facing the prospect of a complete shift away from fossil fuels for everything from electricity production and transportation fuels to life-saving pharmaceuticals and medical devices.

Electric Reliability Council of Texas, Inc. (ERCO) electricity generation by energy source 2/4/2021 – 2/17/2021, Central Time



There has been considerable discussion about the factors involved in the recent rolling blackouts and electric grid problems in Texas caused by extremely cold weather. What is clear in this graph, however, is that the state’s natural gas infrastructure was the most reliable supplier of electricity during this 12-day period in February.

The Facts Are Clear

Natural gas will continue to play a key role in supplying affordable and reliable power to meet our demand for electricity, just as it will continue to be used as the source of choice for heating and food preparation in tens of millions of homes. Oil will continue to be refined into gasoline, diesel, jet fuel and lubricants needed to deliver those products and others that support the mobility and standard of living Americans expect in an advanced society. And, both natural gas and oil will be essential to manufacture thousands of consumer, medical and commercial products that many Americans take for granted every day.

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