

## Renewable Energy's Big Secret

By Steve Goreham

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Climate change has again moved to center stage. Last week in his State of the Union address, President Obama [stated](#), "But for the sake of our children and our future, we must do more to combat climate change." Two days later, Senators Sanders and Boxer introduced a legislative package [calling](#) for a carbon tax on coal mines, refineries, and natural gas facilities. On Sunday, an estimated 35,000 climate crusaders joined a rally on the national mall in Washington, [urging](#) President Obama to block the Keystone XL pipeline project.

These efforts advocate reducing the use of hydrocarbon energy from oil, coal, and natural gas while increasing incentives for wind, solar, biofuel, and other renewable energy sources. Proponents say that use of renewables will reduce carbon dioxide emissions that are claimed to be causing dangerous global warming. But they don't tell you about renewable energy's big secret.

Renewable energy remains a tiny part of our energy picture. According to the U.S. Department of Energy, by the end of 2011, 39,000 wind turbine towers were operating in the United States, but [provided](#) only 2.9% of our electricity, compared to 42% from coal, 25% from natural gas, 20% from nuclear, and 6% from hydroelectric sources. After twenty years of subsidies and mandates, solar energy remained absolutely trivial, contributing a miniscule 0.04% of our electricity. Ethanol and biodiesel [provided](#) about 11% of U.S. vehicle fuel at the heavy cost of using 40% of the corn crop.

*Renewable energy's big secret is that the two biggest renewable sources, wind and biofuels, don't reduce carbon dioxide emissions.* Wind energy is highly variable. Wind output can ramp from negligible output to 100% of rated output to zero again over just a few hours. On average, wind systems provide rated output only about 30% of the time, so they can't replace hydrocarbon or nuclear electricity sources. Coal or natural gas plants must be used as backup to the wind system, ramping up and down inefficiently to mirror changes in wind velocity.

Your car has two mileage ratings, one for city driving and one for highway driving. A typical car may get 23 miles per gallon (mpg) in the city and 33 mpg when driving on the highway. Stop-and-go driving uses more fuel and produces more emissions than highway driving at continuous speed.

Wind farms change our electrical networks into stop-and-go electrical systems. Analysis of utilities in [Netherlands](#) and [Colorado](#) show that combined wind-hydrocarbon systems use more fuel, produce more nitrogen oxide and sulfur dioxide pollutants, and emit more

carbon dioxide than coal or natural gas systems alone. Despite claims to the contrary, addition of wind farms to our electrical grid does not reduce emissions.

Neither does the use of biofuels reduce carbon dioxide emissions. For years, advocates for the fight against climate change assumed the burning of biofuels to be “carbon neutral.” Even though the burning of wood or plant material releases CO<sub>2</sub> to the atmosphere like any other combustion, the “carbon neutral” concept assumed that as biofuel plants grow they absorb CO<sub>2</sub> equal to the amount released when burned.

But a 2011 opinion by the European Environment Agency [pointed](#) to a “serious error” in greenhouse gas accounting. The carbon neutral concept does not take into account the CO<sub>2</sub> that would be absorbed by the natural vegetation that grows on land not used for biofuel production. A 2011 study by the National Academy of Sciences [found](#) that, after considering land use effects, production of ethanol as replacement fuel for gasoline was likely to “increase such air pollutants as particulate matter, ozone, and sulfur oxides.” The study also found that greenhouse gas emissions from ethanol fuel were likely to be higher than gasoline.

So, even if you ascribe to the theory of man-made climate change, it’s unlikely that deployment of renewable energy will significantly reduce greenhouse gas emissions.

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