

# Life After Oil and Gas

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*WE will need fossil fuels like [oil](#) and gas for the foreseeable future. So there's really little choice (sigh). We have to press ahead with fracking for [natural gas](#). We must approve the [Keystone XL](#) pipeline to get Canadian oil.*

This mantra, repeated on TV ads and in political debates, is punctuated with a tinge of inevitability and regret. But, increasingly, scientific research and the experience of other countries should prompt us to ask: To what extent will we really “need” fossil fuel in the years to come? To what extent is it a choice?

As renewable energy gets cheaper and machines and buildings become more energy efficient, a number of countries that two decades ago ran on a fuel mix much like America's are successfully dialing down their fossil fuel habits. Thirteen countries got more than 30 percent of their electricity from renewable energy in 2011, according to the Paris-based International Energy Agency, and many are aiming still higher.

Could we? Should we?

A [National Research Council report](#) released last week concluded that the United States could halve by 2030 the oil used in cars and trucks compared with 2005 levels by improving the efficiency of gasoline-powered vehicles and by relying more on cars that use alternative power sources, like electric batteries and [biofuels](#).

Just days earlier a team of [Stanford engineers published a proposal](#) showing how New York State — not windy like the Great Plains, nor sunny like Arizona — could easily produce the power it needs from wind, solar and water power by 2030. In fact there was so much potential power, the researchers found, that renewable power could also fuel our cars.

“It's absolutely not true that we need natural gas, coal or oil — we think it's a myth,” said Mark Z. Jacobson, a professor of civil and environmental engineering and the main author of [the study](#), published in the journal Energy Policy. “You could power America with renewables from a technical and economic standpoint. The biggest obstacles are social and political — what you need is the will to do it.”

Other countries have made far more concerted efforts to reduce fossil fuel use than the United States and have some impressive numbers to show for it. Of the countries that rely most heavily on renewable electricity, some, like Norway, rely on that old renewable,

[hydroelectric](#) power. But others, like Denmark, Portugal and Germany, have created financial incentives to promote newer technologies like wind and [solar energy](#).

People convinced that America “needs” the oil that would flow south from Canada through the Keystone XL pipeline might be surprised to learn that Canada produced 63.4 percent of its electricity from renewable sources in 2011, largely from hydropower and a bit of wind. (Maybe that is why Canada has all that oil to sell.) The United States got only 12.3 percent of its electricity from renewables in 2011. Still, many experts say that aggressively rebalancing the United States’ mix of fossil fuel and renewable energy to reduce its carbon footprint may well be impractical and unwise for now.

“There is plenty of room for wind and solar to grow and they are becoming more competitive, but these are still variable resources — the sun doesn’t always shine and the wind doesn’t always blow,” said Alex Klein, the research director of IHS Emerging Energy Research, a consulting firm on renewable energy. “An industrial economy needs a reliable power source, so we think fossil fuel will be an important foundation of our energy mix for the next few decades.”

Fatih Birol, chief economist at the 28-nation International Energy Agency, which includes the United States, said that reducing fossil fuel use was crucial to curbing global temperature rise, but added that improving the energy efficiency of homes, vehicles and industry was an easier short-term strategy. He noted that the 19.5 million residents of New York State consume as much energy as the 800 million in sub-Saharan Africa (excluding South Africa) and that, even with President Obama’s automotive fuel standards, European vehicles were on average more than 30 percent more fuel efficient than American ones.

He cautioned that a rapid expansion of renewable power would be complicated and costly. Using large amounts of renewable energy often requires modifying national power grids, and renewable energy is still generally more expensive than using fossil fuels. That is particularly true in the United States, where natural gas is plentiful and, therefore, a cheap way to generate electricity (while producing half the carbon dioxide emissions of other fossil fuels, like coal). Promoting wind and solar would mean higher electricity costs for consumers and industry.

Indeed, many of the European countries that have led the way in adopting renewables had little fossil fuel of their own, so electricity costs were already high. Others had strong environmental movements that made it politically acceptable to endure higher prices in order to reduce emissions.

But Dr. Birol predicted that the price of wind power would continue to drop, while the price of natural gas would rise in coming years, with the two potentially reaching parity by 2020. He noted, too, that countries could often get 25 percent of their electricity from renewable sources like wind and solar without much modification to their grids. A few states, like Iowa and South Dakota, get nearly that much of their electricity from renewable power (in both states, wind), while others use little at all.

So as Europeans have grown accustomed to [wind turbines](#) dotting the landscape, much of America continues to regard renewable power as a boutique product, cool but otherworldly. When I tell colleagues that Portugal now gets 40 percent of its electricity from renewable power, the standard response is “Portugal is windy.” But many places in America are, too. When I returned from Kristianstad, Sweden, and marveled at how that city uses waste from farms, forestry and food processing plants to make [biogas](#) that supplies 100 percent of its heat, the response is likewise disbelief. But I’d venture that a similar plan could work fine in Milwaukee or Burlington, Vt., cities that also anchor rural areas.

MAPPING studies by Dr. Jacobson and colleagues have concluded that America is rich in renewable resources and (unlike Europe) has the empty space to create wind and solar plants. New York State has plenty of wind and sun to do the job, they found. Their blueprint for powering the state with clean energy calls for 10 percent land-based wind, 40 percent offshore wind, 20 percent solar power plants and 18 percent solar panels on rooftops — as well as a small amount of [geothermal](#) and hydroelectric power.

Dr. Jacobson said that careful grid design and coordination of power sources would ensure a stable power supply, although a smidgen of natural gas would be needed for the 0.2 percent of the time that renewables failed to generate sufficient electricity. The report claims that the plan would create 58,000 jobs in New York State (which now imports much of its power), create energy security and ultimately stabilize electricity prices.

The authors say the substantial costs of enacting the scheme could be recouped in under two decades, particularly if the societal cost of pollution and carbon emissions were factored in. The team is currently working on an all-renewable blueprint for California.

Sounds good on paper, but even Europe is struggling a bit with its renewable ambitions at the moment.

Germany, which got 20.7 percent of its electricity from renewable energy in 2011, is re-evaluating the incentives it provides to increase that share to 35 percent by 2020, because of worries that its current approach will drive up power prices inordinately at a time of economic uncertainty. It has had trouble ramping up transmission capacity to carry the wind power generated in the blustery North to the industrial South, where it is needed.

Dr. Birol said that natural gas and renewable energy could ultimately be “a good couple” for powering New York State, and elsewhere. But in what mix? If, in 20 years, cars are 50 percent more efficient and New York State could get much of its electricity from wind and solar, should we be more measured in making fossil fuel investments? As Gov. Andrew M. Cuomo considers the boundaries of hydraulic fracturing in New York State and as Secretary of State John Kerry decides the fate of the Keystone XL pipeline, how much we really “need” fossil fuels is worth pondering.

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