

Time to rethink misguided policies that promote biofuels to protect climate

September 24 2013

Policymakers need to rethink the idea of promoting biofuels to protect the climate because the methods used to justify such policies are inherently flawed, according to a University of Michigan energy researcher.

In a new paper published online in the journal *Climatic Change*, John DeCicco takes on the widespread but scientifically simplistic [perception](#) that biofuels such as ethanol are inherently "carbon neutral," meaning that the heat-trapping [carbon dioxide gas](#) emitted when the fuels are burned is fully balanced by the [carbon dioxide](#) uptake that occurs as the plants grow.

That view is misguided because the plants used to make biofuels—including corn, soybeans and [sugarcane](#)—are already pulling carbon dioxide out of the atmosphere through [photosynthesis](#), said DeCicco, a research professor at the U-M Energy Institute and a professor of practice at the School of Natural Resources and Environment.

DeCicco's paper is unique because it methodically deconstructs the life-cycle-analysis approach that forms a basis for current [environmental policies](#) promoting biofuels. Instead, he presents a rigorous [carbon cycle](#) analysis based on biogeochemical fundamentals to identify conditions under which biofuels might have a climatic benefit. These conditions are much more limited than has been presumed.

"Plants used to make biofuels do not remove any additional carbon dioxide just because they are used to make fuel as opposed to, say, corn flakes," DeCicco said.

DeCicco stressed that research and development are important to create better options for the future. R&D is especially needed for bio-based or other technologies able to efficiently capture and use more carbon dioxide than is already being captured and stored by natural vegetation. But going beyond R&D and into subsidies, mandates and other programs to prop up biofuels is unwarranted, he said.

DeCicco's direct carbon accounting examines carbon sources and sinks (storage sites, such as forests or crop fields) separately, an approach that lends greater clarity about options for addressing carbon dioxide emissions from liquid fuels.

"Biofuels have no benefit at the tailpipe," DeCicco said.

Per unit energy, the carbon dioxide emissions from burning ethanol are just 2 percent lower than those from gasoline. Biodiesel yields carbon dioxide emissions about 1 percent greater than those from petroleum diesel.

"If there is any climate benefit to biofuels, it occurs only if harvesting the source crops causes a greater net removal of carbon dioxide from the air than would otherwise have occurred," DeCicco said.

His paper concludes that for now, it makes more sense to enable plants to soak up carbon dioxide through reforestation and to redouble efforts to protect forests, rather than producing and promoting biofuels.

Corn ethanol production of 14 billion gallons supplied 4.4 percent of total U.S. transportation liquid fuel use in 2011. However, even that

small share of liquid fuel supply required 45 percent of the U.S. corn crop.

Biofuels are the presumed replacement for the petroleum-based transportation fuels, gasoline and diesel, that dominate liquid fuel use. In the United States, the federal Renewable Fuel Standard mandates a large increase in biofuels use, which has now reached 16 billion gallons a year, mainly [ethanol](#). But DeCicco pointed out that a recent National Academy of Sciences report concluded that the Renewable Fuel Standard may not reduce greenhouse gas emissions at all, once global impacts are counted.

More information: dx.doi.org/10.1007/s10584-013-0927-9

Provided by University of Michigan

Citation: Time to rethink misguided policies that promote biofuels to protect climate (2013, September 24) retrieved 25 April 2024 from <https://phys.org/news/2013-09-rethink-misguided-policies-biofuels-climate.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.