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Studies Say Clearing Land for Biofuels Will Aid Warming

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Clearing land to produce biofuels such as ethanol will do more to exacerbate global warming than using gasoline or other fossil fuels, two scientific studies show.

The independent analyses, which will be published today in the journal *Science*, could force policymakers in the United States and [Europe](#) to reevaluate incentives they have adopted to spur production of ethanol-based fuels. [President Bush](#) and many members of Congress have touted expanding biofuel use as an integral element of the nation's battle against climate change, but these studies suggest that this strategy will damage the planet rather than help protect it.

One study – written by a group of researchers from [Princeton University](#), Woods Hole Research Center and [Iowa State University](#) along with an agriculture consultant – concluded that over 30 years, use of traditional corn-based ethanol would produce twice as much greenhouse gas emissions as regular gasoline. Another analysis, written by a [Nature Conservancy](#) scientist along with [University of Minnesota](#) researchers, found that converting rainforests, peatlands, savannas or grasslands in [Southeast Asia](#) and [Latin America](#) to produce biofuels will increase global warming pollution for decades, if not centuries.

Tim Searchinger, who conducts research at [Princeton](#) and the D.C.-based German Marshall Fund of the United States, said the research he and his colleagues did is the first to reveal the hidden environmental cost of producing biofuels.

"The land we're likely to plow up is the land that we've had taking up carbon for decades," said Searchinger, the lead author. Estimating that it would take 167 years before biofuel would stop contributing to climate change, he added, "We can't get to a result, no matter how heroically we make assumptions on behalf of corn ethanol, where it will actually generate greenhouse-gas benefits."

Researchers said the findings applied to other forms of ethanol-based fuel as well, at emissions rates that varied depending on the nature of the land being converted and the crop being grown on it, with sugar cane ranking as the most efficient. The results of the studies are significant because industrialized countries are pushing so aggressively to boost biofuel production as an alternative to gasoline. The recently passed energy bill mandated the production of 36 billion gallons of biofuels annually by 2022, compared with about 7.5 billion gallons today. Just last month, the European Union's Transport Ministry proposed a directive calling on member countries to power 10 percent of their transportation with biofuels.

The studies emphasized the time it would take to pay back the "carbon debt" created by clearing land to grow biofuel crops, in the words of Joe Fargione, central region science director for the Nature Conservancy, but biofuel industry officials – as well as administration and congressional officials – said it is unfair to judge ethanol in its current form, because the industry continues to make technological advances.

"This is a good way of showing where we are, not where we're going to be," said [Rep. Edward J. Markey](#) (D-Mass.), who is chairman of a House global warming panel and who helped write the energy legislation. Noting that

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the measure set benchmarks requiring any new ethanol plants to produce a fuel that is 20 percent more efficient than gasoline, and even more stringent standards for advanced biofuels, he added, "Once you set the standard, then it's going to drive where the investment is made, where the breakthroughs are."

[James L. Connaughton](#), chairman of the White House Council on Environmental Quality, said he remains convinced that many biofuels produce substantial environmental benefits.

"Like any issue, there are ways to do it right and there are ways to do things wrong, and the same is the case to biofuels," he said. "We move as rapidly as we can to second-generation [biofuels] because those offer the best opportunity for a low environmental profile."

Brent Erickson, executive vice president of the [Biotechnology Industry Organization](#)'s industrial and environmental section, said using renewable resources always made sense in the long run, compared with gasoline and diesel fuel.

"It makes no sense to continue burning fossil carbon, which is essentially carbon that has already been sequestered for millions of years in the Earth's crust, and which when burned releases carbon dioxide and also creates a carbon debt that can never be paid back," he said. "It is much more logical to produce biofuels that recycle carbon, even if a short-term carbon debt is created. Even if it's 167 years, you're still better off than burning oil that can never be paid off."

But an array of senior scientists who work on climate change, including Missouri Botanical Society President Peter H. Raven and William H. Schlesinger, president of the Cary Institute of Ecosystem Studies, sent a letter to Bush and congressional leaders yesterday urging them to reconsider their energy policies in light of the new studies.

"While politicians in the U.S. and Europe have tried to craft policies dictating that new biofuels will not come at the expense of clearing land, the papers show that sometimes land conversion is often an indirect result of this expansion," the 10 scientists wrote. "There is an urgent need for policy that ensures biofuels are not produced on productive forest, grassland or cropland."

Alex Farrell, a professor with [Berkeley](#)'s Energy and Resources Group who concluded in 2006 that biofuels produce a net environmental benefit, said the paper by Searchinger and his colleagues changed his mind.

"The qualitative result that biofuel produced on fertile land has higher greenhouse gas emissions than fossil fuels is almost certainly true, even if it's only by a certain amount," Farrell said in a telephone interview. "But we can make better biofuels. The right thing to do is to give the biofuel industry the incentives and support to move to a more sustainable production method."

One of the biggest tests will come when the [Environmental Protection Agency](#) issues its analysis of the climate impact of biofuels, which according to the energy bill must include "direct emissions and significant indirect emissions such as significant emissions from land use changes."

[Rep. Jay Inslee](#) (D-Wash.), a member of the House Energy Committee, said policymakers would have to rely on scientists to help them sort out such questions.

"Our challenge really is to find out a way to quantify these things, so when you adopt a policy, you factor in these land use issues," Inslee said, adding that the new findings point out that "we ought to be open to new science, but we also have to continue with upward leaps in biofuels."

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