

# Rapeseed biodiesel fails sustainability test

European Commission's calculations of greenhouse-gas emissions questioned.

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Biodiesels made using rapeseed oil may not be sustainable enough to be used in the European Union (EU), say researchers who question the European Commission's own studies into the fuel source.

Europe's Renewable Energy Directive (RED), which was introduced in 2009, requires that, until 2017, greenhouse-gas emissions from the production and use of biofuels for transport be at least 35% lower than those from fossil fuels; thereafter, 50% lower. According to the commission's studies, rapeseed oil — also known as canola oil — meets the RED requirement, delivering greenhouse-gas cuts of at least 38% compared with conventional fuels, making it eligible for blending in biodiesels. The oil currently makes up over 80% of all vegetable oils used in European biofuels.



MICHAEL URBAN/AFP/GETTY IMAGES

Rapeseed oil is a major constituent of European biofuel

However, [a study](#) published last month — one of the most detailed so far — attempted to replicate the commission's calculations and found that in most cases the emissions savings were much lower.

Gernot Pehnelt and Christoph Vietze, economists at GlobEcon, an independent research institute in Jena, Germany, calculated the greenhouse-gas savings of rapeseed biofuel in several different situations. They looked at factors such as variations in soil quality and fertilizer application during crop production, and different efficiencies in fuel production. They also compared the biofuel emissions with values for fossil fuels used in the commission's calculations and others in the scientific literature.

In the scenario that most closely resembled the calculations run for the European Commission, the team found greenhouse-gas savings of 29.7% for rapeseed, well below the commission's 38% estimate.

Only in one case, when the team used best-case greenhouse-gas-saving values for rapeseed production, did they find that the biofuel produces low enough emissions to be regarded as a sustainable biofuel under RED, when compared to both the higher and lower fossil fuel GHG emissions values.

## Transparency trouble

"Saying that rapeseed is sustainable in every case, as the EU does now, is simply not correct," Pehnelt says. He also criticizes the commission for a lack of transparency in its calculations, saying "it is not clear how they reach these values or what the sources are of some of their input and output data".

The European Commission has rejected the criticisms, saying in a statement to *Nature*: "Different studies can come to different results, depending on the assumptions used. The figures used as default values by the Commission are the result of a comprehensive process including input from world leading experts, where all input data and assumptions are freely available.

"The author's claims regarding non-transparency are more provocative than factual," the statement adds, saying that all data is published on the website of the Joint Research Centre, the commission's in-house science service in Ispra, Italy.

In replicating the commission's calculations, the new study did not consider the environmental and social effects of indirect land-use change, such as loss of food production as land is made available to grow biofuels. If these changes were taken into account, rapeseed biofuel would be even less sustainable, the authors say.

Fausto Freire, who conducts research on biofuels at the University of Coimbra in Portugal, agrees with Pehnelt and Vietze's conclusion that the actual greenhouse-gas savings of rapeseed biofuel are much lower than those estimated by the commission. Freire says that there are "huge uncertainties" associated with the greenhouse-gas emissions of biodiesel. "The Europe directive is not transparent

and the calculations don't provide the data to justify the numbers," he says.

The European Commission will carry out a full review of the policy in 2014, and is already working on an assessment of the indirect land-use changes resulting from its biofuel policy. It expects to present a legislative proposal on how its policy should take account of these changes "as soon as possible".

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