

Now, it's increasingly seen as an example of how well-meaning efforts to limit climate-changing carbon emissions may backfire.

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AMSTERDAM, Netherlands - Only a few years ago, oil from palm trees was viewed as an ideal biofuel: a cheap, renewable alternative to petroleum that would fight global warming. Energy companies began converting generators and production soared.

Marcel Silvius, a climate expert at Wetlands International in the Netherlands, led a team that compared the benefits of palm oil to the ecological harm from destroying virgin Asian rain forests to develop lucrative new plantations. His conclusion: "As a biofuel, it's a failure."

Scientists and policymakers from more than 100 countries are meeting in Brussels, Belgium, starting Monday to report on the impact of global warming, including storms, flooding and the extinction of plants and animals.

Then in May, the group intends to issue recommendations on how best to fight it, through new technologies and possible use of alternatives. The lessons of palm oil are sure to figure into their discussion.

Long a primary ingredient in food and cosmetics, palm oil derivatives caught on about five years ago as a source of renewable energy, spurred by subsidies in many

[European Union](#) countries. Imports have risen 65 percent since 2002. Palm oil is attractive because it is relatively abundant, cheap at about \$550 per ton, and requires few or no modifications to existing power stations.

Unlike carbon-rich fossil fuels, palm oil is considered carbon-neutral, meaning the carbon emitted from burning it is the same as what is absorbed during growth. But the result of intensified farming has been to unleash far more greenhouse gases than will be saved at power stations.

The report issued late last year by Wetlands International, Delft Hydraulics and the Alterra Research Center of Wageningen University in Holland studied the carbon released from peat swamps in Indonesia and Malaysia that had been drained and burned to plant palm oil trees. About 85 percent of the world's palm oil comes from the two countries, and about one-quarter of Indonesia's plantations are on drained peat bogs, the report said.

The four-year study found that 600 million tons of carbon dioxide seep into the air each year from the drained swamps. Another 1.4 billion tons go up in smoke from fires lit to clear rain forest for plantations — smoke that often shrouds Singapore and Malaysia in an impenetrable haze for weeks at a time.

Together, those 2 billion tons of CO₂ account for 8 percent of the world's fossil fuel emissions, the report said. Friends of the Earth, another environmental group, called the report "astonishing," and said it shows that harvesting palm oil for fuel is counterproductive. "It undermines the whole project," said a climate specialist for the group, Anne van Schaik.

The study was not independently verified by the U.N. Climate Change Secretariat in Bonn, Germany, or by the World Resources Institute in Washington, D.C., the two leading monitoring groups. But experts said the research appeared credible. It is due to be published for peer review later this year.

Deforestation is the No. 2 cause of greenhouse gas emissions after the burning of fossil fuels, said Jeffrey Dukes, a biologist at the University of Massachusetts who was not part of the research. He said clearing peat swamps for plantations is "a double whammy."

It not only releases carbon trapped over many millennia, but destroys the most efficient ecosystem on the planet for sucking carbon from the atmosphere, Dukes said.

Expanding production of palm oil is "a terrible decision. Whether or not it's consciously made, it's society going in reverse," he said.

Major power companies are divided on whether to continue or pursue palm oil generation. Leon Flexman, of RWE npower, Britain's largest electricity supplier, said his company decided against palm oil after a year of study because it could not verify its supplies would be free of the taint of destroyed rain forest or peat bogs, he said.

The Dutch power company Essent announced in December it had stopped burning until it can trace and verify the sources.

Biox, a Dutch startup, said it plans careful scrutiny of palm oil sources but will proceed with construction of three 50 megawatt power stations that burn palm oil byproducts exclusively. That's enough electricity to light all the homes in Amsterdam.

"From the start, we knew we can't stay in business if we can't prove that production is sustainable," said Biox executive Arjen Brinkmann. "Until this report came out, peat lands was not an issue because we hadn't heard of it. Nobody had heard," he said, adding that it will now be a factor in the company's sustainability criteria.

So far, the reservations about palm oil do not seem to have affected the market. Production rose 6.6 percent last year and will increase another 5.5 percent this year to 37 million tons, according to Fortis Bank. Prices have risen 35 percent in the last year and are still rising, it said.