

Clue: A major city



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# Apart from used chip fat, there is no such thing as a sustainable biofuel

Even capitalists now admit the oil crisis is real. But their solutions border on lunacy as they avoid the obvious answer



**George Monbiot**  
The Guardian, Tuesday February 12 2008

Now they might start sitting up. They wouldn't listen to the environmentalists or even the geologists. Can governments ignore the capitalists? A report published last week by Citibank, and so far unremarked on by the media, proposes "genuine difficulties" in increasing the production of crude oil, "particularly after 2012". Though 175 big drilling projects will start in the next four years, "the fear remains that most of this supply will be offset by high levels of decline". The oil industry has scoffed at the notion that oil supplies might peak, but "recent evidence of failed production growth would tend to shift the burden of proof on to the producers", as they have been unable to respond to the massive rise in prices. "Total global liquid hydrocarbon production has essentially flatlined since mid 2005 at just north of 85m barrels per day."

The issue is complicated, as ever, by the refusal of the Opec cartel to raise production. What has changed, Citibank says, is that the non-Opec countries can no longer answer the price signal. Does this mean that oil production in these nations has already peaked? If so, what do our governments intend to do?

Nine months ago, I asked the British government to send me its assessments of global oil supply. The results astonished me: there weren't any. Instead it relied exclusively on one external source: a book published by the International Energy Agency. The omission became stranger still when I read this book and discovered that it was a crude polemic, dismissing those who questioned future oil supplies as "doomsayers" without providing robust evidence to support its conclusions. Though the members of Opec have a powerful interest in exaggerating their reserves in order to boost their quotas, the IEA relied on their own assessments of future supply.

Last week I tried again, and I received the same response: "The government agrees with IEA analysis that global oil (and gas) reserves are sufficient to sustain economic growth for the foreseeable future." Perhaps it hasn't noticed that the IEA is now backtracking. The Financial Times says the agency "has admitted that it has been paying insufficient attention to supply bottlenecks as evidence mounts that oil is being discovered more slowly than once expected ... natural decline rates for discovered fields are a closely guarded secret in the oil industry, and the IEA is concerned that the data it currently holds is not accurate." What if the data turns out to be wrong? What if Opec's stated reserves are a pack of lies? What contingency plans has the government made? Answer comes there none.

The European commission, by contrast, does have a plan, and it's a disaster. It recognises that "the oil dependence of the transport sector ... is one of the most serious problems of insecurity in energy supply that the EU faces". Partly in order to diversify fuel supplies, partly to cut greenhouse gas emissions, it has ordered the member states to ensure that by 2020 10% of the petroleum our cars burn must be replaced with biofuels. This won't solve peak oil, but it might at least put it into perspective by causing an even bigger problem.

To be fair to the commission, it has now acknowledged that biofuels are not a

It sounds good, but there are three problems. If biofuels can't be produced in virgin habitats, they must be confined to existing agricultural land, which means that every time we fill up the car we snatch food from people's mouths. This, in turn, raises the price of food, which encourages farmers to destroy pristine habitats - primary forests, ancient grasslands, wetlands and the rest - in order to grow it. We can congratulate ourselves on remaining morally pure, but the impacts are the same. There is no way out of this: on a finite planet with tight food supplies, you either compete with the hungry or clear new land.

The third problem is that the commission's methodology has just been blown apart by two new papers. Published in Science magazine, they calculate the total carbon costs of biofuel production. When land clearance (caused either directly or by the displacement of food crops) is taken into account, all the major biofuels cause a massive increase in emissions.

Even the most productive source - sugar cane grown in the scrubby savannahs of central Brazil - creates a carbon debt which takes 17 years to repay. As the major carbon reductions must be made now, the net effect of this crop is to exacerbate climate change. The worst source - palm oil displacing tropical rainforest growing in peat - invokes a carbon debt of some 840 years. Even when you produce ethanol from maize grown on "rested" arable land (which in the EU is called set-aside and in the United States is called conservation reserve), it takes 48 years to repay the carbon debt. The facts have changed. Will the policy follow?

Many people believe there's a way of avoiding these problems: by making biofuels not from the crops themselves but from crop wastes - if transport fuel can be manufactured from straw or grass or wood chips, there are no implications for land use, and no danger of spreading hunger. Until recently I believed this myself.

Unfortunately most agricultural "waste" is nothing of the kind. It is the organic material that maintains the soil's structure, nutrients and store of carbon. A paper commissioned by the US government proposes that, to help meet its biofuel targets, 75% of annual crop residues should be harvested. According to a letter published in Science last year, removing crop residues can increase the rate of soil erosion a hundredfold. Our addiction to the car, in other words, could lead to peak soil as well as peak oil.

Removing crop wastes means replacing the nutrients they contain with fertiliser, which causes further greenhouse gas emissions. A recent paper by the Nobel laureate Paul Crutzen suggests that emissions of nitrous oxide (a greenhouse gas 296 times more powerful than CO<sub>2</sub>) from nitrogen fertilisers wipe out all the carbon savings biofuels produce, even before you take the changes in land use into account.

Growing special second-generation crops, such as trees or switchgrass, doesn't solve the problem either: like other energy crops, they displace both food production and carbon emissions. Growing switchgrass, one of the new papers in Science shows, creates a carbon debt of 52 years. Some people propose making second-generation fuels from grass harvested in natural meadows or from municipal waste, but it's hard enough to produce them from single feedstocks; far harder to manufacture them from a mixture. Apart from used chip fat, there is no such thing as a sustainable biofuel.

All these convoluted solutions are designed to avoid a simpler one: reducing the consumption of transport fuel. But that requires the use of a different commodity. Global supplies of political courage appear, unfortunately, to have peaked some time ago.

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