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Homebrew Biodiesel

Local Group Case Study

Need to use a car but want to do something about its greenhouse gas emissions?

This was the situation of a member of Brighton and Hove Friends of the Earth. Here he outlines his innovative solution – homebrew biodiesel.

Introduction

I never thought I'd find an environmental solution to the problem of my wife. Her work as a nurse in a rural area is simply impossible without her own car. She shares my concerns about CO₂ emissions and the social impact of cars and roads, but for many years we thought we'd just have to be pragmatic, and bear the snipes at our hypocrisy.

However, there is a solution. You can produce your own fuel in your own back garden very simply and with very little equipment. Not only is it very rewarding but you will also halve your diesel bill and reduce your CO₂ emissions to zero at a stroke. I've given an outline of what's involved below. If you are interested in following it up further, there's more than enough information on the web - simply follow the links at the end.

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How it works

Mix vegetable oil (used or unused) with methanol (an industrial solvent) and sodium hydroxide (caustic soda) in a large mixing tank for 9 hours (I use a water butt and an old central heating pump – see the picture to the right).

A couple of days later a thin layer of black glycerol will settle out at the bottom of the tank. Draw off this glycerol to leave a clear amber liquid – biodiesel. You have to wash this biodiesel with water, which involves adding water, mixing again and then waiting for the water to settle to the bottom. Once you've drawn off this water the biodiesel is ready for use in any diesel car – no conversion required.



Even the waste product, glycerol, has uses. Although most people compost it, it can also be converted (after simple processing) into a hand cleaner or mixed 50/50 with sawdust and burnt in a wood-fired burner.

Cost

The methanol and sodium hydroxide together cost about 15 pence per litre of end product. Chippies have to pay to have their used oil taken away, so they are usually happy to let you pick it up for nothing. The duty on biodiesel (see below) is 26 pence per litre. The total cost is therefore about 40 pence per litre, compared with pump prices of about 80 pence. There's also your time to consider (about 4 hours for a 180 litre batch) – think of it as a hobby ...

Customs & Excise

There is a common misconception that if you are running your car on oil, either unconverted or converted into biodiesel, then you are outside the law. Not at all. So long as you register with HM Customs & Excise (ask for form EX103, see the number below) and pay the duty of 26 pence per litre you are perfectly legal.

Safety

Biodiesel is very slow to burn; a lit match will extinguish in a beaker of biodiesel at room temperature. However, it is a fuel and you must take the appropriate safety measures. Methanol has a very low flash point, and when mixed with sodium hydroxide it becomes extremely corrosive (particularly on skin). You must be very careful and follow to the letter the instructions on the material safety data sheet. There are plenty of guidelines on this on the web – see the links below.

Benefits

Not only is biodiesel carbon-neutral (i.e. the CO₂ you emit when you burn it was originally taken out of the atmosphere by the plant as it grew), but it is also a better engine lubricator than normal diesel, it produces 60% less particulates, 50% less hydrocarbons and no sulphur compounds. It is as toxic as salt and as biodegradable as sugar. It doesn't smell, either in the reactor or after combustion.

And finally

Best of luck if you do decide to start making your own biodiesel – I can't promise you a trouble-free ride, but you will find it very rewarding. Remember that if you don't have to work hard for it, it isn't worth achieving!

Links

- Want to run your car on biodiesel without making it yourself? No problem. Locate your nearest outlet here: <http://www.biodieselfillingstations.co.uk/>
- For more information on making your own biodiesel check out the 'biodiesel bible' *"From the fryer to the fuel tank"* by Joshua Tickell, at: <http://www.veggievan.org>
- If you'd like to know more about the issue of car warranties and biodiesel look here: <http://www.rixbiodiesel.co.uk/>
- For everything you need to know from a UK site go to: <http://www.veggiepower.org.uk>
- For another comprehensive site look at: <http://journeytoforever.org/biodiesel>
- An example of a supplier of equipment is: <http://biofuelsystems.com>
- You can even chat to others online about biodiesel at: <http://biodiesel.infopop.cc>
- HM Customs & Excise National Advice Service: 0845 010 9000