low-impact living initiative

LILI

LILI information sheet

veg oil motoring

what is it?

Rudolf Diesel designed his engine to run on vegetable oil. You can still do it today, but some modifications to your diesel engine will be necessary (it's not possible with petrol engines). Veg oil is too viscous to use directly in an unmodified engine, so there are two ways that viscosity can be reduced:

1. by removing glycerine to make biodiesel (see biodiesel information sheet), in which case no engine conversion is necessary
2. by converting the engine to use straight oil (which reduces viscosity by pre-heating the fuel)

Biodiesel can be used in any diesel engine, and mixed with mineral diesel in any ratio.

Straight vegetable oil should not be used in an unconverted diesel engine, due to its viscosity, and the fact that the glycerine content may cause 'coking' of fuel injector heads and possible engine failure.

It's perfectly legal despite the recent reports of arrests in Wales for driving on veg oil. They weren't paying road fuel duty on the oil. As long as you do this, you won't get into trouble (see 'what can I do?').

why is it good for the environment?

Vegetable oil is a biofuel, and as such is virtually carbon-neutral. This means that the carbon dioxide (CO_2) released when the fuel is burnt is absorbed by the plants that will provide the next crop of oil. As CO_2 is the main greenhouse gas, switching to biofuels can help to slow down global warming.

Emissions are cleaner too – sulphur is eliminated, and a range of other pollutants are reduced dramatically (including particulates, carbon monoxide, and unburnt hydrocarbons). Further benefits include: requires less energy to produce; doesn't have to be transported such large distances; renewable resource; non-toxic; and biodegradable.

These environmental benefits also apply to biodiesel, but if you're sure that your car is worth a conversion to be able to use straight vegetable oil, this is a more environmentally-friendly option, as there will be none of the problems associated with the waste from the biodiesel production process. However, a major environmental bonus of biodiesel is that it can utilize waste cooking oil. Used oil is best converted to biodiesel, because it will contain salts that could be corrosive to your engine. Processing the oil into biodiesel removes these salts. Having said that, Diesel Veg (see 'where can I…?') know of people who have covered over 100,000 miles using waste oil.

what can I do?

With a petrol car, nothing – veg oil is for diesel vehicles only. To find out which cars can be converted, see Diesel Veg ('where can I…?'). Cooking oil in supermarkets (3-litre containers) is around 40p per litre, then duty of 26p (46p for mineral diesel) means that your fuel will cost less than 70p per litre. Diesel Veg and Goat Industries (see 'where can I…?') sell cleaned-up used oil in bulk, with VAT and fuel duty already paid (duty invoice supplied).

Two-tank method

An extra tank is added for veg oil. You start with diesel, then switch to veg oil when the engine is hot, and it is continually heated via

Land's End to John O' Groats: *Daniel Blackburn, seen here beginning his journey to promote veg oil motoring. He filled up with cooking oil bought from shops on the way.*

a heat exchange system. Before stopping, switch to the diesel tank again so that there will be mineral diesel in the fuel line when you come to start your car again. Cost installed c. £800. DIY kit c. £400.

'Elsbett' one-tank method

German kit with a few installers in the UK. It's simpler – you don't have to remember to switch to mineral diesel. Veg oil and mineral diesel can be mixed in the same tank, but Elsbett say no used oil. They have designed an engine where veg oil is the fuel and the coolant, so it gets continually heated. When starting from cold, there is an electrically-heated jacket on the fuel filter.

In a conventional diesel engine, fuel is initially sprayed onto a heater plug at the top of the chamber (which is why you have to wait a few moments for the plug to heat up when starting a diesel engine); in an Elsbett conversion, the heater plug stays on until the engine is up to temperature.

The 2 main pump manufacturers in the UK are Bosch and Lucas. To run on veg oil a Bosch pump is preferable. Lucas pumps have a 'paddle' mechanism which can't cope with the heavier veg oil. A good mechanic can swap a Bosch pump for a Lucas.

Cost installed c. £850-1300, depending on vehicle. DIY kit c. £550-750. More difficult than two-tank conversion - a job for experienced mechanics only.

all the kit required *for an Elsbett conversion of a Citroen ZX.*

'Elsbett' engine conversion: *filter heater and heat exchanger mounted in car.*

Paying duty

In the budget of 2002, the road duty for biofuels was reduced by 20p per litre (as long as certain criteria concerning ester and sulphur content were met - no problem with vegetable oil). Contact Customs and Excise for advice, and for form EX 103. You let them know how much fuel you use each month, and pay duty accordingly.

where can I find out more?

- LILI will be running DIY conversion courses soon, in conjunction with Diesel Veg (see below); check our website for dates
- www.dieselveg.com - Wolverhampton, 01902 450001; conversions; DIY kits; list suitable vehicles; links; supply filtered used oil in bulk – up to 1000 litres
- www.vegoilmotoring.com - West Wales, 01239 698237; conversions; information; links
- www.goatindustries.co.uk, 01248 671982; information; conversion kits; supply oil
- HM Customs and Excise national advice line: 0845 010 9000

Contact us to find out more about **LILI**. We run a range of residential weekend courses on practical environmental topics, and install facilities directly. For an annual subscription of £10 you can become a 'Friend of **LILI'**, and receive our biannual newsletter, discounts on our literature and courses, and help us to make a difference.

LILI*, Redfield Community, Buckingham Road, Winslow, Bucks, MK18 3LZ*
tel / fax: *(01296) 714184* ***email:*** *lili@lowimpact.org* ***web:*** *www.lowimpact.org*
Registered in England. Company Ltd. by Guarantee no: 4205021