

You don't need to grow it and in some cases it is free to procure but is there enough yellow grease to turn the biofuels market gold?

Small fry?

by **Luke Buxton**

When thinking of the main raw materials for biodiesel an image of tall palms in a hot climate, leafy green soyabeans in America's Midwestern states, or a rolling carpet of yellow rape releasing its sweet smell into the air over Europe comes to mind.

Waste from the deep fat fryer may not look or smell as pleasant as these feedstocks, but as a waste product it is cheap and its sustainability credentials are indisputable.

It goes by many names – UCO, waste vegetable oil (WVO) and yellow grease. European biodiesel is predominantly rapeseed-fed. However, producers such as Finland-based Neste Oil and the Netherlands-based producer Biodiesel Amsterdam are increasingly seeing both the cost and environmental benefits of UCO.

In the UK in the first 10 months of 2009/10 (15 April 2009 to 14 January 2010) 32 million litres of UCO biodiesel were reported to the Renewable Fuels Agency (RFA). This is 3% of the UK biofuel supply. UCO automatically qualifies for the Renewable Transport Fuel Obligation (RTFO) Environmental and Social Sustainability Meta-Standard, which contains seven sustainability principles, covering preservation of carbon stocks, preservation of biodiversity, air, soil and water quality, land rights and workers rights.

Despite its advantages

UK biofuel feedstocks 2008/9	
Feedstock	Volume (litres)
Other *	5 million (<1%)
Unknown	13 million (1%)
UCO	40 million (3%)
Sugar beet	41 million (3%)
Tallow	115 million (9%)
Palm	127 million (10%)
Sugarcane	180 million (14%)
Oilseed rape	324 million (25%)
Soya	438 million (35%)

*'Other' includes cheese by-product, municipal solid waste, molasses, sulphite and sunflower. Verified data 2008/09 obligation year.

Source: Renewable Fuels Agency

it is rarely used in large quantities alone. In the UK the feedstock is usually processed into biodiesel using a mix of soyabeans, tallow, rapeseed and palm oil, by producers such as Lissan, Greenergy, Harvest, Mabanaft, Petroplus and Shell.

And across the Atlantic of the 150 listed biodiesel plants in the US only 13 are UCO-only fuelled, generating 22.75 million gallons of biodiesel a year.

In contrast soyabean feeds 27 plants with an output of 665.5 million gallons a year. A further six plants use a mixture of soyabean oil and UCO exclusively, equating to 34 million gallons a year of biodiesel. At least a further 10 use some UCO.¹ The US has a large beef market, and even animal fats exceed UCO as a singular feedstock. Most of this is down to Texas having large cattle ranches and the most biodiesel plants in the US.

While the US has an

estimated 2 billion gallons of UCO available business models are not always in place to collect the oil and depending on market price and demand it is sometimes fed to other industries to be turned into lubricants or soaps.

When it is available, producers cannot always rely on its quality. Restaurants and other food institutions use different cooking oils so the levels of sediment and water in the product vary. Its high free fatty acid content can also make it difficult to process.

As with all feedstocks location is key. By placing small plants close to areas of supply, pick-ups are less expensive. For this reason UCO lends itself to small scale facilities of up to around 5 million gallons a year.

Take away

One of the key concerns producers have with UCO is availability of supply.

'Our main challenge is being able to collect enough to meet demand,' Nigel Jewison, a director at UK-based Uptown Biodiesel, explains.

Uptown Biodiesel collects an estimated 10,000 litres of UCO a week, but supply fluctuates and some of that 10,000 litres is used for heating oil.

Initially Uptown Biodiesel began making UCO-biodiesel supplied by 750 restaurants, pubs and companies for its own fleet then it bought a larger production unit in August 2008, and began selling to hauliers. It now primarily targets London's large fleet of black cabs as well as the heating fuel market.

The company is restricted to producing 1.5 million litres a year under its Pollution Prevention and Control (PPC) license. Uptown Biodiesel does not sell to oil majors because it has sufficient demand locally. It would also reduce the fuel's sustainability credentials if it was shipped further away for use.

The fuel complies with the UK's RTFO but the company has to pay duty up front before Renewable Transport Fuel certificates are awarded by the RFA.

Once the certificates are awarded producers must wait for the next auction which can be two months before it can sell the certificates. It may take three months to receive the monies owed, putting an enormous burden on cash-flow for small business.

Jason Askey-Wood, a director at Uptown Biodiesel



Uptown Biodiesel is filling up London's cabs

does not believe this is the right approach. 'My feeling is that the RFA works for larger biofuel companies, not small recycled B100 companies. Recycled B100 should be rewarded for its environmental benefits by being free of road fuel duty and not gaining The Renewable Transport fuel certificates,' he says.

'Such companies should

still report volumes to the RFA so that HMRC could calculate the loss of revenue and increase the duty on fossil fuels to compensate the loss. The increase in duty on fossil fuels would be negligible to fund this.'

As outlined in the 2009 Pre-Budget Report, the £0.20 (€0.23) duty differential for UCO biodiesel is being

extended beyond April 2010 through the creation of a duty relief scheme. But costs are still mounting up.

'Now the weak pound versus the Euro means it is more beneficial for large oil providers to sell to Europe as they get a higher value there,' Jewison remarks. 'In most European laws taxation on biodiesel is more economically-friendly. There are cases where companies collect oil, export it to the EU, make biodiesel tax-free, then re-import it to the UK getting a £0.38 tax benefit. Uptown Biodiesel's costs are in the form of vans and drivers. Oil collectors try to sell oil for £0.40 per litre, but that is uneconomic. 'We have £0.38 duty and we're selling at £1.05, of that £0.54 goes to customs and VAT and £0.15 to chemicals, which leaves £0.36 to buy the oil.'

Paradise grease

Bahamas Waste is another company successfully using UCO in a local, isolated model.

The Bahamians love their fried food, Francisco de Cardenas, MD of Bahamas Waste, says as he oversees the construction of a

\$750,000 (€563,000) biofuels facility that could see the production of biodiesel from as early as June this year.

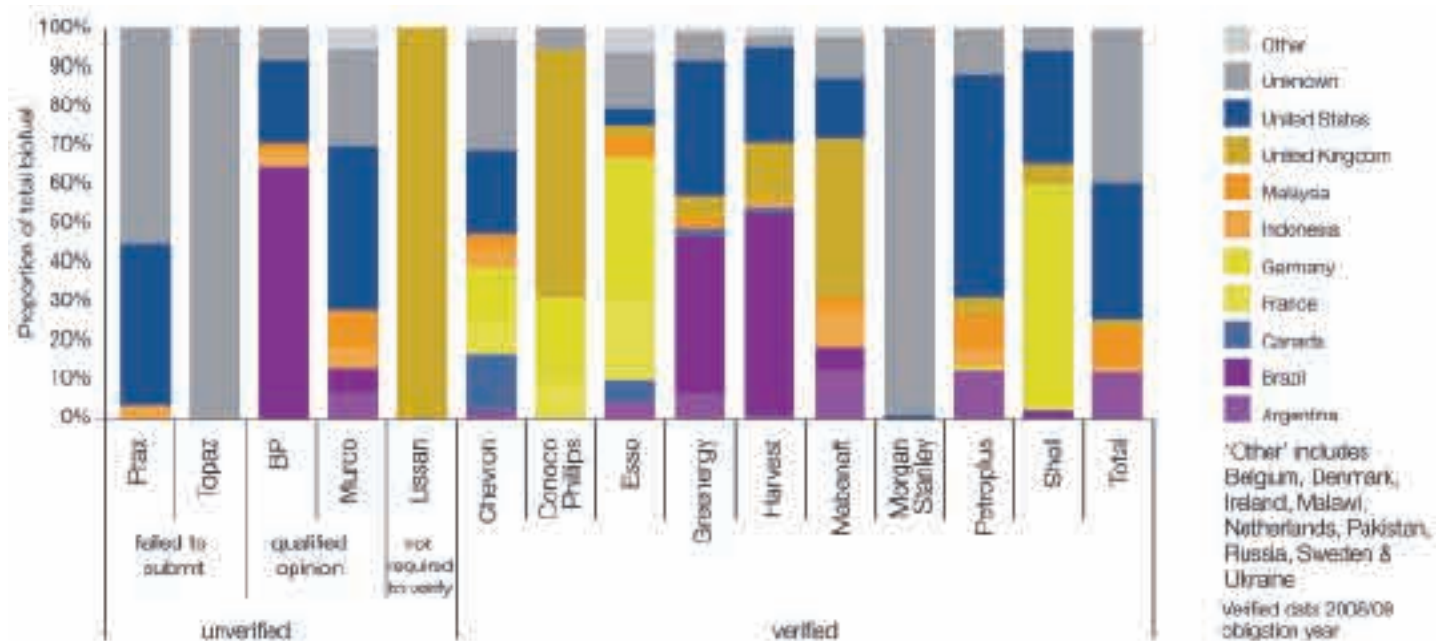
Bahamas Waste offers a comprehensive waste collection and recycling service in the Bahamas from medical waste incineration to residential waste collection to restaurant and hotel food waste collection, including used cooking oils. Previously many restaurants disposed of UCO by pouring it into the ground.

Four years ago the company conducted a feasibility study for a UCO biodiesel project. It is also involved with The Island School, The Cape Eleuthera Institute, which has been producing biodiesel for seven years from UCO at local restaurants.

The feasibility study showed that there are half a million gallons of UCO in the Bahamas, the majority of which will come from the industrial sector such as hotels and restaurants, but domestic oil will also be used. This figure excludes WCO from cruise ships sailing around the Bahamas.

It was not a quick start. 'Nothing happens before it's time, even though we

Suppliers' biofuel mix to UK by country of origin



were providing a social and environmental benefit,' de Cardenas says. In June 2009, after a protracted process, Bahamas Waste got permission to construct a 1 million gallon a year facility. Work began on 22 April 2010. Bahamas Waste will look to sell the biodiesel on the market, but to start with most of it will be for internal use.

'We have a fleet of over 50 trucks, a handful of generators, a boiler, and an incinerator. The challenge for us is to find out what the correct blend is. We're hoping to go immediately to B20 or B50.'

Eventually it hopes to emulate The Island School's model of running its vans on B100, but would need to undertake extensive tests as biodiesel can wear certain materials such as

seals and fuel injectors.

The Bahamas was hit by very high diesel prices, which further charged the company's plans. 'The price of diesel locally is almost \$4 per gallon, and our initial biodiesel plan shows it will cost at least that much to make. Once we get into the volumes it will be produced for a lot less. But until we really get going we won't know true costs.'

To get the wheels turning Bahamas Waste is hoping to be able to procure the UCO for free.

A popular choice

Again using the local business model Tri-State Biodiesel collects UCO from 2,000 restaurants in the metro area of New York as well as several hundred in Connecticut and New Jersey. It has a rendering

facility in the Bronx, where it brings product in, cleans it up and renders it then takes it to a biodiesel processing facility in upstate New York.

Tri-State collected about 150,000 gallons in April at no charge to restaurants, which previously disposed of it with ordinary rubbish. It is getting close to collecting and converting 2 million gallons of UCO a year into biodiesel. It plans to ramp up capacity to 5 million gallons a year.

There is lots of competition, and it is a tough industry, but there is also lots of product. New York has the highest population density in the US. 'Even at this time we find that there is a strong demand for high quality used cooking oil. That has a lot to do with the fact that it is similar in quality but cheaper than soyabean oil, and many markets offering

premium for waste cooking oil-based biodiesel see it as a more environmentally-friendly option,' explains Brent Baker, CEO of New York-based Tri-State Biodiesel.

A hungry appetite

The RFA believes UCO to be the most sustainable biofuel feedstock but this is not enough to ensure its widespread large scale use.

For the time being at least its place in the market is limited to small scale local projects or as an inexpensive supplement to other major feedstocks. ●

1 62 other plants are listed as multi-feedstock and do not divulge if UCO is used amongst them.



Tri-State Biodiesel eyes 2 million gallons a year of biodiesel

Source: Tri-State Biodiesel