

Spotlight on Better Regulation

Regulation of Bio-Diesel

Summary

This paper considers some of the regulatory aspects of achieving the Government's targets for the renewable content of transport fuel; in particular it focuses on bio-diesel and the contribution to the targets that could be made from using waste vegetable oil.

From April 2008, the Renewable Transport Fuels Obligation (RTFO) will require oil companies to include 2.5% of renewables in transport fuel. There are uncertainties over whether there are sufficient sustainable sources of these renewable feedstocks. The Government recognises that there is a challenge to ensure that increasing the demand for bio-diesel does not increase the pressure to produce bio-fuels in an unsustainable way.

Given the uncertainties, making as much use as possible of waste cooking oil as a feedstock makes economic and environmental sense. Converting waste oil into bio-diesel is technically simple, yet the operations are subject to several (mainly environmental) regulatory requirements which do not seem wholly proportionate to the environmental risks involved and the benefits offered.

We recognise the difficulties and legal complexities of waste regulation, and we applaud the actions the Environment Agency has already taken in this area through its low-risk waste panel. But we wonder whether more could not be done to ease the regulatory burdens for bio-diesel production from waste cooking oil, given its clear environmental benefits.

On a more general level, this paper has focused on one specific type of operation and uncovered complex regulatory burdens, raising the question of how many other activities are similarly affected. A full understanding requires detailed study. In the context of their simplification plan, we will be expecting the Environment Agency and Defra to be aiming for this level of detailed analysis if they wish to demonstrate real ambition and achieve the greatest possible reductions in their administrative and policy burdens.

What is the issue?

Bio-fuels are increasingly being promoted as a solution to the growing problem of the contribution of transport to carbon emissions and climate change. From April 2008, the Renewable Transport Fuels Obligation (RTFO) will require oil companies to include 2.5% of renewables in transport fuel. However, there are concerns about the source of the feedstocks for bio-fuels¹.

One potentially sustainable source for bio-diesel is waste vegetable oil from food production and catering. This can be converted into bio-diesel relatively simply and on a small scale,

keeping transport costs and emissions low. However, these operations are affected by several pieces of environmental legislation which impose administrative requirements and costs. It is not clear whether these are discouraging bio-diesel production in the UK. According to the Environment Agency², demand for waste cooking oil exceeds supply. However, as much as 25% of waste cooking oil collected in the UK may be being exported, mainly to Germany and France. This may be entirely due to the difference in duty in these countries, but it raises the question whether differences in regulatory barriers may also play a role.

What is it we are trying to achieve?

The Government's aim is to reduce the carbon emissions from transport. Placing an obligation on transport fuel suppliers to meet targets for the percentage of bio-fuels in the fuels they supply forms one element of its strategy for achieving this aim. The targets are 2.5% from April 2008 rising to 5% in 2010³.

One of the lowest carbon sources of bio-fuel is waste cooking oil⁴. The amount of waste cooking oil from food production and catering establishments available for bio-diesel production (estimated at around 80,000 tonnes per year) corresponds to about 0.4% of diesel consumption in the UK. This is a small component, but could make a useful contribution towards meeting the 2.5 and 5% targets. And, if suitable collection systems could be developed, use could also potentially be made of the roughly similar quantities arising from the domestic use of cooking oil⁵, although the quality of this material is more questionable.

Because the production of fuels, such as bio-diesel, and the treatment and disposal of wastes involve processes with the potential to cause harm to the environment, there is legislation in place to control these activities. The most relevant in the context of bio-diesel production are the Pollution Prevention and Control Regulations 2000 and the numerous regulations⁶ controlling waste, the aim of which is to ensure the responsible handling, treatment and disposal of wastes, preventing fly-tipping and other bad practices which could damage the environment.

How well are we achieving these outcomes?

Production capacity for bio-diesel in the UK has been growing in anticipation of the RTFO targets: there are two large-scale plants already in operation and a number in development or planning stages³, and there are a large number of small-scale producers (see below). But, there remain questions over where the feedstock for these plants is to come from. For example, around 30% of the current UK crop of rapeseed oil would be needed as feedstock to meet the 2.5% target, and meeting the 5% target would take more than half of the current UK crop⁷. Imports are a possibility, but rapeseed oil sources (where over 90% of the UK's imports are from France, Belgium, Finland and the Netherlands) are all countries with similar fuel demand and land area issues to the UK. The cheapest virgin feedstock for bio-diesel is palm oil, but sources of palm oil (where 85% of the UK's imports come from Papua New Guinea, Indonesia, Malaysia, Colombia & the Netherlands) are generally countries where there are already problems with deforestation to provide land for palm plantations.

The Government has recognised these issues: it has noted that imported bio-fuels will have a role to play in higher levels of bio-fuel supply in the UK⁸; and has stated⁹ that its aim to increase the RTFO above 5% after 2010 is dependent on the development of robust carbon saving and sustainability assurance schemes. In the interim, it is developing a reporting framework, under which transport fuel suppliers will be required to report in detail on the greenhouse gas balance and wider environmental impacts of the bio-fuels they put on the

market. The RTFO Administrator would then use annual reports to compare the performance of fuel suppliers and publish information on supplier performance.

In these circumstances, making as much use as possible of waste cooking oil as a feedstock makes economic and environmental sense. The process for converting used cooking oil into bio-diesel is relatively simple (see Figure 1) and requires little in the way of complex technology. It is therefore amenable to being carried out on a small scale. However, for small scale operators, in particular, there are a number of barriers to establishing a commercially competitive business. These are illustrated in Box 1.

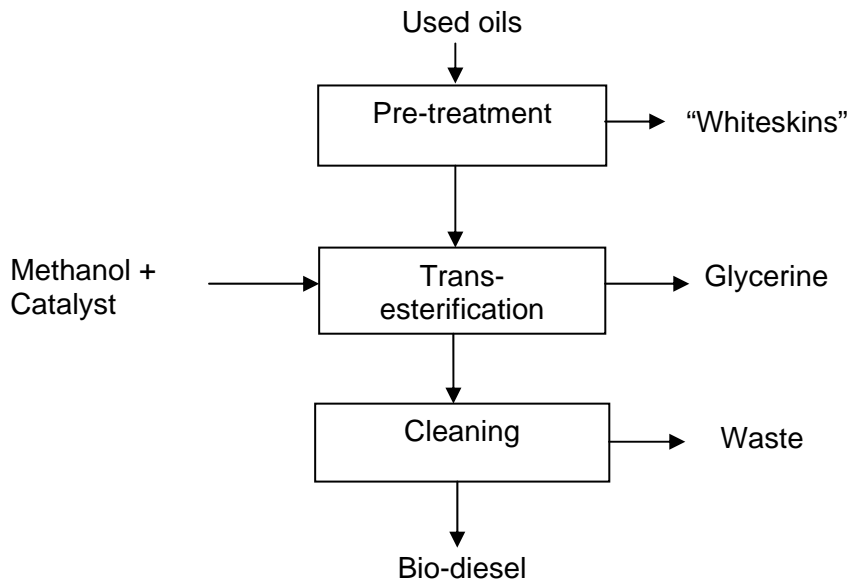


Figure 1. Process for Converting Used Cooking Oil into Bio-diesel

The environmental regulatory requirements include the need for a PPC permit. In the legislation, there is no clear threshold below which a PPC permit is not required: the IPPC Directive refers to production “on an industrial scale”, whereas the PPC regulations refer to production for commercial purposes. For bio-diesel production, the Environment Agency interprets production for commercial purposes of more than 5000 litres per year (enough to fuel around 3-4 vehicles) to be subject to PPC permitting. In comparison, a viable small scale producer is likely to be processing around 20,000 litres per month. Given that this type of facility can be housed comfortably in half of a typical small industrial unit, it is arguable whether this comprises “industrial scale” as envisaged in the IPPC Directive. That a simple, small scale facility for converting waste cooking oil into bio-diesel, while presenting some environmental risks, should be subject to the same permitting regime as a large scale organic chemicals facility does not seem wholly proportionate, even though there is some flexibility to apply a risk-based approach within the PPC regime. The Environment Agency has simplified the PPC regime for those operators who meet low impact criteria¹⁰, but the onus for making the case for this rests on the operator. Currently approximately 75% of operators regulated under PPC regulations are permitted as low impact installations.

The requirements relating to waste impose additional burdens. For example, collections of waste cooking oil are subject to carriers’ registration and duty of care requirements, and storing waste cooking oil and bio-diesel made from it is, in principle, subject to waste management licensing (unless covered by a PPC permit). The Environment Agency has sought to address some of these burdens: it has established a low-risk waste panel and this has excluded some storage and treatment operations from the need to obtain a waste

management licence. While these actions are to be applauded, the benefits for small scale commercial producers are limited, as these operations are still subject to PPC permitting. In addition, all of the wastes and by-products from the process, which could potentially be put to beneficial use, remain subject to waste legislation. In particular, glycerine could be used in a glycerine burner to provide background heating to the facility. However, because the original feedstock (the used cooking oil) is waste, current legislation classes the by-product as waste, and its burning as waste incineration, subject to the Waste Incineration Directive (WID). The additional costs of complying with this legislation make glycerine burning prohibitive.

Box 1: Some barriers to commercial conversion of used cooking oil into bio-diesel

- Economics: collection, processing and transport costs alone can be up to 30 pence per litre, and duty is currently just over 28 pence per litre, compared with a current pump price for diesel of around 93 pence per litre, leaving little headroom for return on capital and profit.
- Feedstock is classed as a waste and is subject to waste legislation, including waste carriers' registration and 'duty of care' requirements, which imposes administrative burdens and costs, such as registration fees
- Trans-esterification process is classed as a chemical process under the IPPC Directive and the PPC regulations, and a PPC permit is required. The process of applying for a PPC permit may be found difficult: the application form is designed for all chemical production activities, and the questions asked are generic rather than specific to bio-diesel production. Having a PPC permit also imposes costs in application and subsistence fees
- Testing the final product for conformity with the European standard costs £700 per batch. For small volume producers, a batch will not make enough profit to justify this cost.

The effects of these regulations are not clear. Figures provided by the Environment Agency² on the numbers of small scale operators raise more questions than they answer: 1457 bio-diesel producers are registered for duty purposes with HM Revenue and Customs, but nearly two-thirds of these (920) have submitted a nil return (i.e. although registered, have not produced any bio-diesel); of the remaining 537, only 37 have produced bio-diesel in sufficient quantity to warrant a PPC permit. At the same time, demand for waste cooking oil is stated to exceed supply. It is hard to see how this can be reconciled with the above figures for bio-diesel production unless a significant proportion of waste cooking oil is being exported. Current estimates² suggest that exports are running at around 25%, mainly to France and Germany where there is no duty payable on bio-diesel. Whether there are any differences in regulatory requirements which also play a role in encouraging exports is not clear.

There is clearly a trade-off that needs to be made between encouraging activities which could benefit the environment (using waste cooking oil to substitute virgin vegetable oil - and mineral oil – to make road transport fuel) and maintaining necessary regulatory controls to protect the environment and community from potentially harmful operations. We recognise that poor practice in bio-diesel production can have significant environmental impacts, including pollution of watercourses, damage to sewage systems, increased fire hazards and vermin, noise and odour problems, and that methanol is a hazardous material requiring appropriate storage. Small-scale operators themselves consider that applying for a PPC permit, while over-complex, bureaucratic and costly, does have some benefits in encouraging a review of the management of the whole process. However, we remain to be convinced that the current situation has the balance quite right.

How can we do better?

There are uncertainties over the consequences of the imposition of the targets for bio-fuels in the Renewable Transport Fuels Obligation. The Government does not believe it can go further than its current proposals on reporting requirements, for example to restrict bio-fuels to those which achieve at least 40-50% of carbon savings in the short term, because this would be against World Trade Organisation rules, although it has stated that it intends to reward bio-fuels on the basis of their carbon savings as soon as the necessary international agreements are in place. It is also obliged to meet the requirements of the European Directive on the bio-fuel content of road transport fuels. However, we believe that it needs to be prepared to take corrective action in the event that the results of the required reporting and other monitoring that it intends to carry out show that demand can only be met by using unsustainable sources involving increased carbon emissions.

In parallel with this and, as far as possible, to ease the demand for virgin vegetable oil, at least in the short term, maximum use should be made of waste cooking oil as a feedstock. Every incentive should be used to encourage the recycling of used cooking oil into bio-diesel, preferably within the UK. In the context of PPC permitting requirements, the Environment Agency is already exploring the opportunities that a standard rules permit under the upcoming Environmental Permitting Regulations might offer for bio-diesel production, and this is welcome. In addition, the Environment Agency could review the 5000 litre per year threshold which it uses to decide whether a PPC permit is required, including investigating how other EU countries interpret the term “on an industrial scale” in this context.

Defra and the Environment Agency are constrained over the definition of waste and the applicability of the Waste Incineration Directive. For example, work which the Environment Agency had planned to undertake on the definition of waste in the context of burning is on hold pending a legal appeal. There is guidance from Defra¹¹ which contains arguments which could be used to remove simple burning of glycerine for space heating from the requirements of the WID (for example, over the meaning of incineration plant), but these arguments do not appear to be being applied in this case. Although a lot of work has been carried out in this area by Defra and the Environment Agency, they could usefully investigate further and review to what extent these barriers to the beneficial use of waste products from the process could also be minimised.

Conclusions

This paper raises questions around the sustainability of supply of bio-fuel. DfT faces a challenge to ensure that the increasing demand for bio-diesel does not increase the pressure to produce bio-fuels unsustainably. Should this happen, it may prove necessary to take urgent action to mitigate these undesired consequences, possibly at European level.

It also raises the question of whether the right balance has been reached over the trade-off between encouraging activities which could benefit the environment (using waste cooking oil to substitute virgin vegetable oil - and mineral oil - in road transport fuel) and maintaining necessary regulatory controls to protect the community and the environment from potentially harmful operations. In particular the requirements of PPC permitting could be reduced, for example, by adopting a different threshold, or by pursuing the work on standard rules permits.

The issues highlighted over the regulatory aspects associated with the handling, treatment and disposal of waste are illustrative of similar problems in many other sectors. This is also not a new problem, reflecting the difficulties and legal complexities involved. The Environment Agency considers that it has simplified the regulatory regime in this area as much as it can, given the constraints in EU Directives and national transposition. The

Environment Agency's low-risk waste panel, for example, is a welcome and laudable step in the right direction. But we wonder whether more could not be done to ease the regulatory burdens for bio-diesel production from waste cooking oil, given its clear environmental benefits.

On a more general level, this paper has focused on one specific type of operation and uncovered complex regulatory burdens. This raises the question of how many other activities are similarly affected, particularly by the complexities associated with the regulation of the collection, recovery and recycling of waste. A full understanding requires detailed study. In the context of their simplification plan, we will be expecting the Environment Agency and Defra to be aiming for this level of detailed analysis if they wish to demonstrate real ambition and achieve the greatest possible reductions in their administrative and policy burdens.

Footnote

This short paper is the fourth in a series being prepared by the Better Regulation Commission to address issues raised by stakeholders. We will highlight good and bad practice in meeting the aims of a particular area of legislation and make recommendations for improvement actions.

The Better Regulation Commission is an independent advisory body established to advise the Government on action to: reduce unnecessary regulatory and administrative burdens; and ensure that regulation and its enforcement are proportionate, accountable, consistent, transparent and targeted. Further information about our work programme and membership can be found on our website: <http://www.brc.gov.uk/>.

Given the Commission's wide membership, there is often overlap between the work of the Commission and the interests of members. On this issue, the interests of Rick Haythorhwaite, Star Capital Partners Limited, and Michael Gibbons are noted.

¹ See, for example, the House of Commons Environment, Food and Rural Affairs Committee, First Special Report of Session 2006-07, HC 131, 13 December 2006. Available at

<http://www.publications.parliament.uk/pa/cm200607/cmselect/cmenvfru/131/131.pdf>

² Amanda Barratt, Environment Agency, personal communication. May 2007. Information based on a draft *Technical Report on the manufacture of products from waste vegetable oil* (not yet available) by a Technical Advisory Group made up of representatives from the Environment Agency, the Waste and Resources Action Programme (WRAP) and industry.

³ Department for Transport, Consultation on the draft Renewable Transport Fuel Obligations Order 2007.

Available at <http://www.dft.gov.uk/consultations/open/draftrtfo/rtfo>

⁴ Worldwatch Institute, Biofuels for Transportation – Extended Summary. 7 June 2006. Available from [Worldwatch Institute](http://www.worldwatch.org/).

⁵ Based on purchases of vegetable and salad oils set out in [Expenditure and Food Survey](http://www.defra.gov.uk/food/fsc/) available from Defra.

⁶ For a list of the legislation and regulations which apply to waste, see, for example, the NetRegs site established by the Environment Agency, the Scottish Environment Protection Agency and the Environment and Heritage Service for Northern Ireland. The page with links to waste legislation can be found at: [Environment Agency - Waste Legislation](http://www.netregs.gov.uk/)

⁷ Based on figures in the [Digest of United Kingdom Energy Statistics 2006](http://www.dft.gov.uk/pgr/roads/environment/rtfo/chpt6energyreview), transport consumption of gas/diesel oil in the UK was 21,140 thousands tonnes in 2005 and, according to [Agriculture in the United Kingdom 2006](http://www.defra.gov.uk/food/fsc/) (Defra), total production of oilseed rape amounted to 1,870 thousand tonnes in 2006.

⁸ Department for Transport, Renewable Transport Fuel Obligation (RTFO) feasibility report, 21 December 2005.

Available at [Department for Transport - Renewable Transport Fuel Obligation \(RTFO\) feasibility report](http://www.dft.gov.uk/pgr/roads/environment/rtfo/chpt6energyreview)

⁹ Transport chapter (Chapter 6) of the Energy Review, 15 December 2006, available on the Department for Transport website at <http://www.dft.gov.uk/pgr/roads/environment/rtfo/chpt6energyreview>

¹⁰ Environment Agency, Making biodiesel – regulations. See the Environment Agency's website at [Environment Agency - Making biodiesel - regulations](http://www.environment-agency.gov.uk/)

¹¹ Defra, Guidance on Directive 2000/76/EC on the incineration of waste. Edition 3. June 2006. Available at <http://www.defra.gov.uk/environment/ppc/envagency/pubs/pdf/wid-guidance-edition3.pdf>