

UK biofuel industry overview

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1 UK biofuel industry overview

The Department for Transport (DfT) has asked Ecofys to produce an overview of the UK biofuel sector, as input to the 2013 Renewable Transport Fuel Obligation (RTFO) Post-implementation review. This report aims to provide an overview of the biofuel production plants operating in the UK, along with insights into the challenges the industry faces, particularly focusing on smaller biofuel producers, and finally industry's recommendations for improving the RTFO.

1.1 Commercial scale UK biofuel production plants

The UK currently has a total biofuel production capacity of over 1,500 million litres per year. Figure 1 and Table 1 show the larger scale commercial biofuel plants in the UK, indicating both operational and (known) planned plants. The development in total larger commercial scale biodiesel and bioethanol production capacity in the UK since the first plant opened in 2005 is shown in Figure 2, followed by a brief description of each of the operational plants.



Figure 1: Operational and planned larger scale commercial biofuel production plants.

Table 1: UK larger commercial scale biofuel plants (operational and planned)

Company	Location	Year of operation	Investment (£ million)	Owners	Jobs	Capacity (million litres)	Fuel type	Current feedstock mix
Operational plants								
Argent Energy	Motherwell, Scotland	2005	£18.8	Swire & Son	70	60	Biodiesel	UCO, tallow, sewage grease
Harvest Energy (formerly Biofuel Corporation)	Seal Sands, Teesside	2006	£250	Blue Ocean Group	50	284	Biodiesel	Primarily waste oils
British Sugar	Wissington, Norfolk	2007	-	British Sugar	30	70	Bioethanol	Sugar beet
Convert 2 Green	Middlewich, Cheshire	2007		Various	60	20	Biodiesel	UCO
Greenery	Immingham, Hull	2007	£50	-	56	220	Biodiesel	Waste oils
Gasrec	Aldbury, Surrey	2008	-	MEZ Energy main investor	21	5	Bio-LBM ¹	Municipal Solid Waste
Ensus	Wilton, Teesside	2010	£310	Crop Energies AG	100	400	Bioethanol	Wheat
Olleco (formerly Agri Energy)	Bootle, Merseyside	2012	-	Olleco	450 ²	16	Biodiesel	UCO
Vivergo	Immingham, Hull	2013	£350	AB Sugar, BP, DuPont	80	420	Bioethanol	Wheat
Planned plants								
INEOS Bio	Seal Sands, Teesside	2016	-	INEOS Bio	-	30	Bioethanol	Municipal Solid Waste
Vireol	Grimsby	2016	-		-	200	Bioethanol	Wheat

Figure 2 charts the development of larger scale biofuel capacity in the UK since 2005. Biodiesel production capacity is seen to dominate the initial period with the commissioning of the Argent Energy (2005), Harvest Energy (2006), Convert2Green and Greenery (2007) plants. No further larger scale biodiesel plants were commissioned until 2012 when the Olleco plant came on stream.

¹ Gasrec produce Liquefied Biomethane (Bio-LBM), which is then blended with Liquid Natural Gas (LNG) to make Bio-LNG.

² 400 of which involved in the collection and processing of UCO. Source: Adam Baisley personal communication.

Bioethanol projects have been slower to develop with the UK's first bioethanol plant being commissioned by British Sugar in 2007. This plant remained the UK's only bioethanol plant for three years. It has since been complemented by two very large bioethanol plants (Ensus in 2010 and Vireo in 2013), significantly increasing the overall bioethanol capacity in the UK, with a third plant (Vireo) planned for 2016. As such, the picture today, and looking ahead to 2016, is that bioethanol capacity represents the larger share.

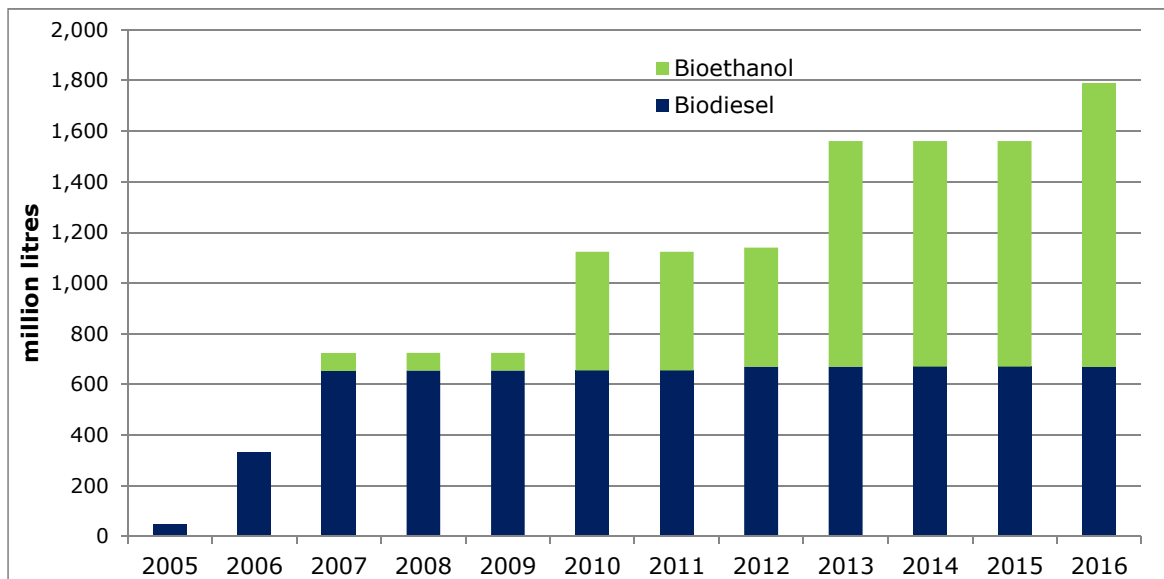


Figure 2: Cumulative production capacity of commercial scale UK bioethanol and biodiesel plants (operational and planned). Figure excludes biomethane production as the capacity is still small relative to the total.

Actual biofuel production has been significantly lower than the total capacity over this period. There are several reasons for this, including the impact of cheap biofuel imports from outside the EU, over-capacity of biodiesel production in general in Europe, high feedstock prices and the effect of the temporary closures of the Ensus (bought by Crop Energies AG) and Biofuel Corporation (bought by Harvest Energy) plants. See sections 1.2 and 1.3 for further information.

An overview of the largest operational commercial scale biofuel plants follows.

Argent Energy^{3, 4}

Argent Energy commissioned the UK's first commercial scale biofuel plant in 2005, located in Motherwell, Scotland. The plant has a current production capacity of 60 million litres of biodiesel (around 52,000 tonnes) and uses tallow, Used Cooking Oil (UCO) and sewage grease as feedstocks.

³ <http://www.argentenergy.com/> -

⁴ Personal communication with Dickon Posnett, Argent Energy Development Director -

The plant was set up with an initial capital investment of around £17 million. In 2009, a further £1.8 million was invested, supported by a grant from the Scottish Government, to build a feedstock pre-processing facility. This enables Argent to remove impurities from the feedstocks prior to use at the plant, enabling them to use more locally produced waste oils.

As well as selling its biodiesel into the UK, Europe and the USA, Argent has contracts with UK fleet operators to supply B30 (30% biodiesel) to around 2,000 vehicles (a limited number of buses also run on B100). The fuel is all distilled and meets the EN 14214 technical standard.

The company was until recently owned by a consortium which included senior management and Souter Investments, a private investment company, but was bought in July 2013 by John Swire & Sons (Green Investments). Argent employs 70 people, including plant operatives, laboratory staff, fuel delivery drivers and admin (12).

British Sugar⁵

British Sugar opened the UK's first bioethanol plant in 2007 at Wisington, Norfolk. The plant produces up to 55,000 tonnes (70 million litres) of bioethanol per year, and uses around 650,000 tonnes of sugar beet (equivalent to around 110,000 tonnes of sugar) as the feedstock.

The Wisington biofuel plant is co-located next to an existing sugar plant which supplies 400,000 tonnes of sugar and 100,000 tonnes of dry animal feed per year, as well as a variety of other products (including top soil and lime). The site employs 240 people in total, of which around 30 are directly involved in the biofuel plant.

Convert2Green⁶

Convert2Green commissioned a 20 million litre biodiesel plant in 2007 located in Middlewich, Cheshire. The plant processes UCO, which is collected from food manufacturers, caterers, restaurants and local authorities across the UK, as well as a number of Household Waste Recycling Centres (such as the Cheshire East region). The company is also involved in the collection of other waste streams, including food waste.

Convert2Green supplies biodiesel either as B100 or as a blend (down to B10). The fuel meets the EN 14214 standard and is also endorsed by the vehicle manufacturer Scania. A key initiative is a fuel supply agreement with 3663 (a UK food wholesale distributor). Currently over 70% of 3663's fleet is powered by B30, and to date over 10 million litres of biodiesel has been supplied to them.

Convert2Green also supply bioliquids to combined heat and power (CHP) systems, including a leisure and community facility in Oldham and the Nando's Junction 27 restaurant (based in Leeds), which became the first UK restaurant to use its own waste cooking oil to power the restaurant.

⁵ <http://www.britishsugar.co.uk/Bioethanol.aspx>

⁶ <http://www.convert2green.co.uk/>

Convert2Green is exploring options to convert other waste materials to biofuel, along with its research and development partner C2Gi.

Convert2Green employs 60 staff (not including those involved in UCO collection).

Crop Energies AG (formerly Ensus)⁷

Ensus started up its bioethanol plant at the Wilton International site on Teesside early in 2010. The plant refines around a million tonnes of UK grown feed grade wheat to produce over 400 million litres of bioethanol and 350,000 tonnes of high protein animal feed per year. The plant also captures 300,000 tonnes of pure carbon dioxide each year, which is liquefied on site and sold to Yara⁸ for distribution to food, drinks and industrial customers in the UK and Europe.

The Ensus plant has been shut down three times in its short lifetime. It was closed in February 2010 just weeks after opening due to odour problems that led to complaints from nearby residents. The problem was resolved, only for the plant to be closed again in May 2011 due to market conditions and the impact of cheaper bioethanol imports into the EU from the USA. This closure was scheduled to last four months, but in the end lasted fifteen months. The plant then reopened, only to be shut again in April 2013. The company cited the poor UK wheat harvest in 2012 (which had an adverse impact on the quality and price of the feed wheat feedstock used within the plant) and rising gas prices as the reasons for the plant's most recent closure.⁹

In July 2013 the plant was purchased by German company, CropEnergies AG, who also operate bioethanol plants in Germany, Belgium, and France with a total production capacity of around 1.2 billion litres of bioethanol per year.

The Ensus One biorefinery initially cost around £250 million to build and a further £60 million investment has been subsequently made. CropEnergies AG are also intending to invest an additional £50 million in improving the competitiveness of the site. Ensus employs around 100 people, and also supports 2,000 jobs in the wider supply chain including farmers, hauliers, engineering support and storage firms.

Gasrec¹⁰

Gasrec was formed in 2003 to develop a process for the clean-up and liquefaction of methane from landfill gas, anaerobic digestion and other sources. In January 2007, construction began on its first plant at SITA's Albury landfill site in Surrey, which was commissioned in June 2008. The plant has a capacity to produce approximately 4,300 tonnes of liquid biomethane (LBM) per annum, equivalent to 5.2 million litres of diesel.

⁷ <http://www.ensusgroup.com/index.php> -

⁸ <http://www.yara.co.uk/> -

⁹ <http://www.gazettelive.co.uk/news/local-news/teesside-biofuel-plant-ensus-closes-3664111> -

¹⁰ <http://gasrec.co.uk/> -

The LBM is blended with Liquefied Natural Gas (LNG) and marketed as Bio-LNG (typically in a proportion of 25% LBM to 75% LNG). Gasrec's customer base includes Tesco, B&Q, DHL, Stobart Group, Waitrose, Laing O'Rourke and Kuehne + Nagel. The company operates five dedicated refuelling facilities and one open access facility for these customers; another seven dedicated stations are in construction.

MEZ Energy is the largest investor in Gasrec.

Greenergy^{11, 12}

Greenergy operates one of the UK's largest biodiesel plants, located at Immingham, with a production capacity of 200,000 tonnes of biodiesel (equivalent to around 227 million litres), although current production is around 140,000 tonnes (160 million litres). The plant was built in 2007 at a cost of around £45 million and employs 41 people with an additional 15 maintenance support staff. It was initially designed to process virgin vegetable oils (including rapeseed and soy), but has since undergone additional investment of around £15 million to enable it to more efficiently process waste feedstocks like UCO. The plant has been exclusively processing UCO since 2010.

In 2011 Greenergy entered into a joint venture with Brocklesby Ltd¹³ to build and operate a 50,000 tonne per year output pre-processing unit to enable higher free fatty acid (FFA) and contaminated waste feedstocks to be processed at Immingham. The plant is located at North Cave (East Yorkshire) and was commissioned in 2013 at a cost of £5 million.

Greenergy is also a major shareholder in biofuel technology provider Scarab Distributed Energy Ltd¹⁴ which was set up in April 2010 to explore opportunities to process biodiesel from 'novel' sources such as the oil and fat in foods such as pies, sausage rolls, pastry and crisps¹⁵. (Brocklesby Ltd are one of the other shareholders.)

As well as operating the Immingham plant, Greenergy owns fuel manufacturing facilities on the Thames Estuary and in Teesside, fuel storage terminals in Plymouth and Cardiff and are currently working to convert two former refineries to import terminals. Greenergy is also building a major new import terminal in a joint venture with Vopak and Shell at Thames Oilport on the site of the former Coryton refinery.

In 2012, Greenergy supplied 13.5 billion litres of petrol, diesel and biofuel, more than one quarter of all the road fuel sold in Britain. Greenergy supplies major oil companies, supermarkets, major fleet users such as bus and logistics companies, independent forecourt operators and fuel resellers.¹⁶

¹¹ <http://www.greenergy.com/index.html>

¹² Personal communication with Patrick Lynch, Greenergy Biofuel Sustainability Manager

¹³ <http://www.brocklesby.org/index>

¹⁴ <http://www.scarab-energy.com/>

¹⁵ These food products typically have an oil content >20%. Greenergy only use foods which are not fit for sale, for example because they are misshapen, overcooked or past their sell by date.

¹⁶ <http://www.greenergy.com/Company/index.html>

*Harvest Energy*¹⁷

Harvest Energy operates a 250,000 million tonne per year capacity biodiesel production plant on the Seal Sands chemical complex in Teesside. The plant primarily processes waste feedstocks at present.

The plant was commissioned in 2006 and initially owned by Biofuel Corporation. However, the company ran into financial difficulties and ceased operation in November 2009. The Blue Ocean group of companies purchased the plant for around £10 million the following July. Blue Ocean is an independent supplier and blender of motor fuels, with operations in the UK, the Netherlands, Germany, France and the Baltics.

In the UK, Harvest Energy is one of the largest independent suppliers of road fuels, supplying more than 10% of the UK's road transport fuel requirements. The company supplies fuels to a diverse commercial base of customers including national supermarket chains (including Morrisons), logistics companies, bus and coach operators, utilities and local authorities.

The Harvest plant currently employs around 50 staff.

Olleco (formerly Agri Energy)^{18, 19}

In April 2012 Olleco commissioned a 16 million litre per year biodiesel plant at Bootle, near Liverpool. The plant processes UCO exclusively. Olleco is also actively involved in the nationwide supply of virgin oils and collection of waste oils (as well as food waste). The company operates 3 UCO processing sites and 14 depots across the country. The company employs around 450 staff, of which 400 are involved in the collection and processing of UCO.

Olleco supply biodiesel that meets the requirements of the EN 14214 standard. The fuel is supplied either as B100, or as a biodiesel blend (either for the road transport or heating market).

*Vivergo*²⁰

Vivergo officially opened the UK's largest biofuel plant in July 2013, at a cost of £350 million (initial production started in Q4 2012). At full capacity the plant can produce up to 420 million litres of bioethanol per year and 500,000 tonnes of animal feed as a co-product, utilising 1.1 million tonnes of (locally grown) feed grade wheat per year. The plant had originally intended to commission in time for the 2011 harvest, but was delayed due to reported issues with its main contractor²¹.

Vivergo is a joint-venture between AB Sugar, BP and DuPont, set up in 2007. The company employs 80 people directly, and is estimated to support over 1,000 additional jobs are through the supply chain (including agriculture, logistics, professional services, engineering support and other fields).

¹⁷ <http://www.harvestenergy.co.uk/>

¹⁸ <http://www.olleco.co.uk/>

¹⁹ Personal communication with Adam Baisley, Olleco Commercial Director

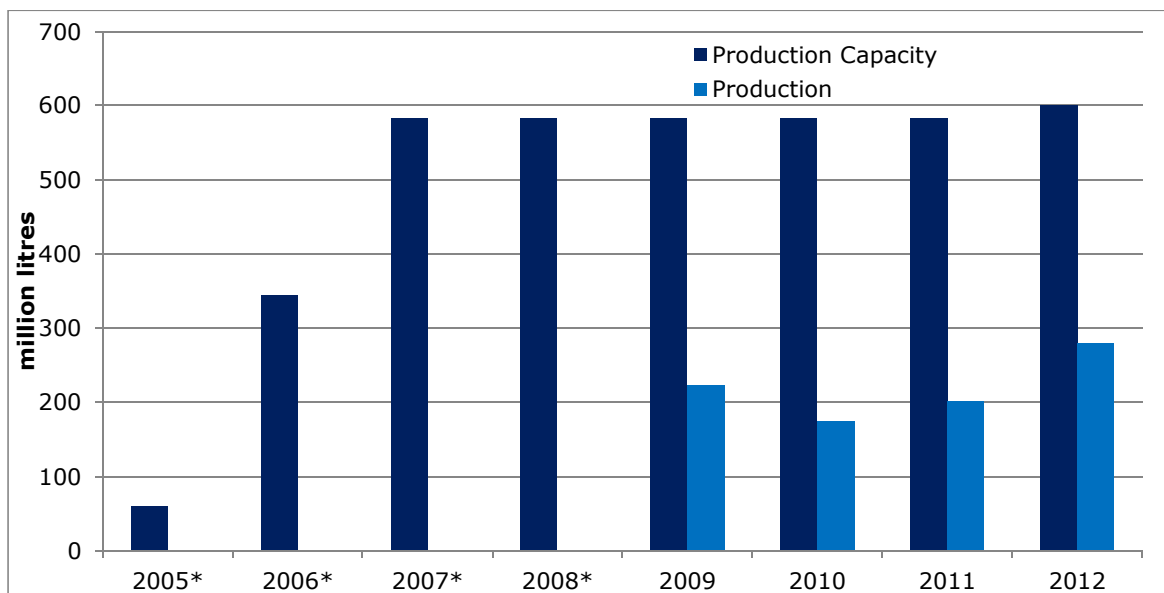
²⁰ <http://www.ensugroup.com/index.php>

²¹ <http://www.nnfcc.co.uk/news/vivergo-bioethanol-plant-unlikely-to-be-ready-for-2011-harvest>

The intention is to retrofit the plant to produce biobutanol in the future, once biobutanol technology conversion has been proven²².

1.2 UK biodiesel capacity and production

Data on biodiesel production from 2009 to 2012 is published by DECC²³ based on surveys undertaken by DECC's Oil and Gas Statistics team. This data is summarised in Figure 3 below along with the information on (larger scale) production capacity presented in Table 1 in the previous section.



*Data on actual production not available in these years

Figure 3: UK biodiesel production capacity vs. production. Sources: Ecofys (production capacity), DECC (production 2009 to 2012)

It is evident that actual UK biodiesel production has been significantly lower than production capacity since 2009, hitting a low of 30% utilisation in 2010 before climbing to 47% in 2012. Although production data is not available prior to 2009 our understanding, based on discussions with UK industry and data from the European Biodiesel Board (EBB), is that utilisation levels were also significantly lower than capacity between 2006 and 2009. This mirrors the picture in Europe where

²² <http://www.bp.com/sectiongenericarticle.do?categoryId=9030044&contentId=7055172>

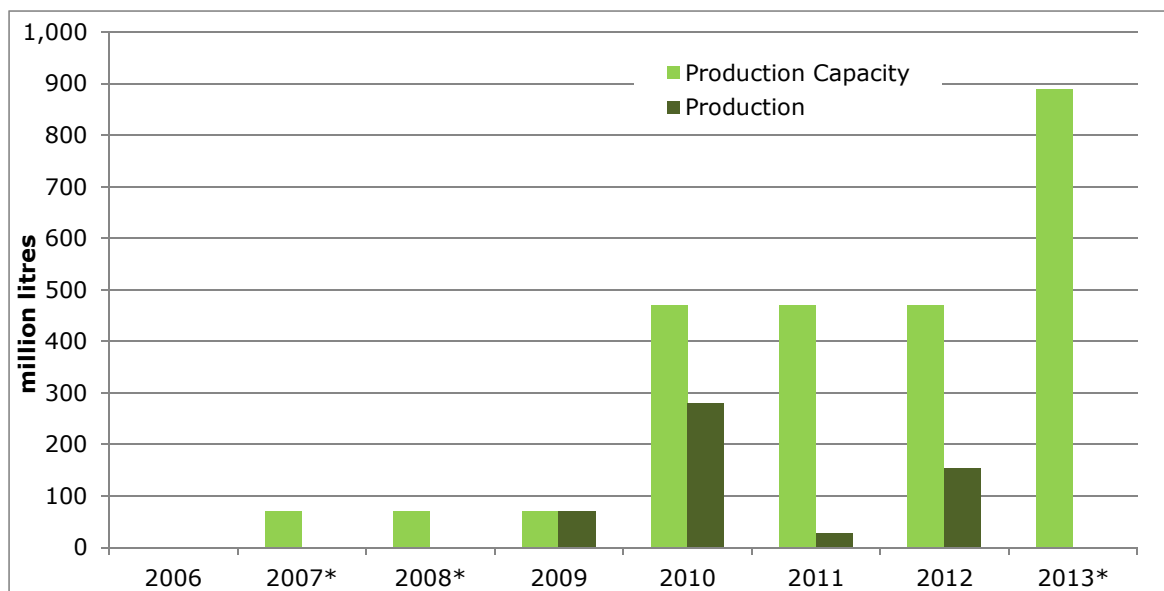
²³ <https://restats.decc.gov.uk/cms/welcome-to-the-restats-web-site/>

biodiesel production (as reported by the EBB²⁴) is estimated to have been running at only 40% to 46% between 2006 and 2009²⁵.

Several biodiesel initiatives were planned in the UK in recent years, but did not result in actual projects. These include a 255 million litre plant in South West England proposed by ABS Biodiesel running on virgin and waste oils and a 204 million litre plant in North Tyneside proposed by Goes on Green running on yellow grease (both planned for 2011)²⁶.

1.3 UK bioethanol capacity and production

Data on bioethanol production from 2009 to 2012 is also published by DECC²⁷ and is summarised in Figure 4 below along with the information on production capacity presented from Table 1.



*Data on actual production not available in these years

Figure 4: UK bioethanol production capacity vs. production. Note that there was no bioethanol production in the UK prior to 2007. Sources: Ecofys (production capacity), DECC (production 2009 to 2012)

UK bioethanol production has also been significantly lower than production capacity since 2009, particularly in 2011 and 2012 when utilisation was only 6% and 17% respectively. This is directly

²⁴ Note that we understand that EBB report data based on EBB member submissions only, rather than data representing all biodiesel producers. -

²⁵ Ecofys, Assessing grandfathering options under and EU ILUC policy, Available at: http://www.ecofys.com/files/files/ecofys_2012_grandfathering%20iluc_02.pdf

²⁶ Source: Global Data

²⁷ <https://restats.decc.gov.uk/cms/welcome-to-the-restats-web-site/>

connected to the temporary Ensus plant closure. (Production capacity data is included for 2013 to indicate the new Vivergo plant opened this year, although actual production data is of course not available for 2013 at the time of writing.) Although production data is not available for 2007 and 2008 our understanding, based on discussions with e-PURE, the European bioethanol association, is that utilisation was 100% in these years. At a European level e-PURE data indicates that European plants were operating at around 56% to 64% of capacity between 2006 and 2009²⁸.

Several bioethanol initiatives were planned for the UK in recent years, but did not result in actual projects. These include two 190 million litre plants proposed by Ethanol Ventures Ltd (located in Lincolnshire and Wilton), a 139 million litre plant proposed by Green Spirit Fuels Ltd in Somerset and a 126 million litre plant proposed by Roquette Freres SA in Northamptonshire. All of these plants were planned for 2011 and would have processed wheat²⁹.

1.4 Overview of smaller UK biofuel plants

In addition to the larger biofuel production plants described in section 1.1, there are over 60 other companies that are currently registered in the RTFO Operating System (ROS). Most of these companies are significantly smaller in scale, typically ranging from a few thousand litres to over a million litres biofuel production per year in the case of, for example, Uptown Biodiesel (see section 2.5.5 for case study).

These smaller biofuel producers make biodiesel from UCO. Many of the companies are also involved in the collection of UCO, and often started out with a UCO collection business. UCO is collected primarily from the commercial sector (e.g. from restaurants, food manufacturers and caterers), but in some cases also from the domestic sector via local council collection points³⁰.

DfT analysis shows that ROS activity among the smaller biofuel producers has decreased sharply in recent years. Various stakeholders, including the Renewable Energy Association (REA) and the UK Sustainable Bio-diesel Alliance (UKSBA³¹) have indicated that many of these producers have gone out of business, or may be supplying other fuel markets. This is further explored in section 2 of this report.

Figure 5 overleaf shows the location of a selection of the known smaller biofuel plants in the UK. These tend to be located near to (or in) major metropolitan areas, with a cluster around London and other plants located in the Glasgow, Liverpool and Sheffield areas.

²⁸ Ecofys , Assessing grandfathering options under and EU ILUC policy, Available at: http://www.ecofys.com/files/files/ecofys_2012_grandfathering%20iluc_02.pdf

²⁹ Source: Global Data -

³⁰ UCO collection market is covered in a jointly published Ecofys study. See 'Trends in the UCO market' report. -

³¹ The UK Sustainable Biodiesel Alliance, set up in 2009, is a representative body of the biodiesel industry, led by waste to energy company - Convert2Green Ltd. -



Figure 5: Operational smaller scale biofuel production plants (all biodiesel production). Note that some of these plants are serving both the road transport and heating markets.

1.5 Employment and investment in the UK biofuel sector

The Renewable Energy Association (REA) and consultancy company Innovas jointly published the report '**Renewable Energy: Made in Britain, Jobs, turnover and policy framework by technology (2012 assessment)**'³², which aims to estimate the jobs and companies supported by the renewable energy sector as a whole, as well as a number of other key economic metrics.

Table 2 provides an overview of the 'key facts' for biofuels presented in the REA report. Data corresponds to the period April 2010 to March 2011 and is presented at an aggregated level for Britain.

³² The executive summary of the report is available at <http://www.r-e-a.net/resources/rea-publications>

Table 2: UK (transport) biofuel industry key facts for 2010/2011

Economic metric	Value
Current employment across supply chain	3,500
Number of UK companies across supply chain	200
UK sector turnover 2010/2011	£485 million
Global market value	£15.4 billion
UK export value today	£25 million

The report considers employment in *production* (production of biofuels, including feedstock production), *supply* (storage and sale of biofuels) and *distribution* (physical movement of the biofuels). However, the collection of waste feedstocks, like UCO is not included in the employment estimate and this is likely to be labour intensive.

The REA estimates that by 2020 the employment figure could rise from 3,500 to over 6,000 if planned investment goes ahead³³.

Our analysis indicates that the 9 commercial scale biofuel producers identified in section 1.1 employ a total of 517 people directly. Additionally jobs in, for example, farming, transport and distribution will be supported by the industry. We also estimate that several thousand people are currently employed in UCO collection in the UK. Estimates of UCO collection jobs vary widely as many factors influence the labour intensiveness of collection, including the location of the UCO (i.e. city centre vs. rural areas) and the UCO source (i.e. food manufacturer vs. restaurant vs. domestic sector).

³³ UK Biofuels Sector – Key Facts & Figures, June 2013, Available at: <http://www.r-e-a.net/resources/rea-publications>

2 Challenges faced by UK biofuel industry

This section includes aspects that are of relevance to both biodiesel and bioethanol producers, although the challenges identified are of particular relevance to smaller producers, who are most often producing biodiesel from double counting feedstocks (like UCO). This section focuses on challenges that result from how the RTFO is designed, rather than on challenges that are a consequence of external factors such as international competition from imported feedstocks or fuels.

2.1 Level of support for biofuels under the RTFO

2.1.1 Duty differential

A 20p per litre fuel tax (duty) exemption was initially introduced for biodiesel in July 2002 and later extended to include bioethanol in January 2005 (but not bio-ETBE). The UK announced in Budget 2008 that these exemptions would cease from 1 April 2010, in-line with an increase in the buy-out price under the RTFO (from 15p to 30p per litre). However, a temporary extension was granted to biodiesel produced from UCO until 31 March 2012.

2.1.2 RTFC pricing

Prior to the implementation of the Renewable Energy Directive (RED) in the UK on 15 December 2011, all biofuel was awarded one RTFC per litre supplied. Following RED implementation biofuels produced from approved waste and residue feedstocks are double counted towards the target and awarded two RTFCs per litre.

RTFCs can be traded bilaterally between producers and obligated suppliers, or sold via brokers or traders. RTFCs can be sold with or without the corresponding fuel. Anecdotally, it is difficult for smaller producers to sell RTFCs directly to the obligated suppliers as the number of RTFCs that the smaller producers can supply on a monthly (or even yearly) basis is too low for the larger suppliers to be interested. One smaller producer interviewed for this project indicated that an obligated supplier (oil major) would only open a trading account for a minimum volume of 1 million certificates.

NFPAS trades RTFCs via monthly on-line auctions and publishes the average price of RTFCs traded³⁴ (see Figure 6). The traded volume is also reported separately. Both the RTFC price and volumes traded vary significantly month by month, with some auctions in fact resulting in no trades. The figure below charts the prices of RTFCs sold via NFPAS auctions over a three year period, between September 2010 and September 2013.

³⁴ <http://www.nfpas-auctions.co.uk/etoc/trackrecord.html>



Figure 6: RTFC e-toc average price data as traded by NFPAS. Note that gaps in the line in Year 5 indicate that no RTFCs were traded in those months (e.g. No Year 5 certificates were traded in Nov-12). Units: pence per RTFC (i.e. per litre, or per 0.5 litres for double counting biofuels)

It is evident that the NFPAS traded certificates have typically traded over a wide price range and that pricing is very volatile. Year 2 certificates traded across a narrow price range of just over 11p to 12.5p, while Year 3 certificates traded upwards of 15p, reaching a high of almost 25p. Year 4 certificates initially traded at between 20p and 23p between July and November 2011, but then decreased significantly to around 14p in December 2011, coinciding with the implementation of the RED in the RTFO and the introduction of double counting, leading several parties to conclude that the introduction of double counting halved RTFC prices as a majority of UK biofuels are currently produced from double counting feedstocks. Year 4 RTFC prices proceeded to reach a low of 5p in November 2012. Year 5 certificates have traded at between 9p and 12p, with the exception of March 2013 when the price achieved reached 18p. By way of comparison, the UKSBA indicates that RTFCs have typically traded at between 8p and 16p per litre.

NFPAS only publish data on the traded volume of certificates for a selection of auctions. The highest volumes to date relate to August 2011 and September 2010, where 15.5 and 7 million certificates were traded respectively. Otherwise, between 1 and 2 million certificates have typically been traded in their monthly auctions (where data has been published). Of note is that no certificates were traded

in several months. For example, no Year 5 certificates were traded in either November 2012 or May 2013.

Although the NFPAS data illustrates some of the anecdotal issues that smaller producers have raised regarding RTFC price volatility and the difficulty in trading, it is not fully clear how representative this data is of the market as a whole. The data should be seen in the context that NFPAS trading activity represents a very small share of the total RTFC market, estimated to be less than 1% (based on RTFO transfer activity³⁵). RTFCs are also traded via other platforms, and can be traded bilaterally either through (confidential) short or long term commercial arrangements. This data should therefore be placed in the context that it is only one of several trading options that biofuel producers have. Nevertheless this in itself illustrates one of the issues that small producers face, as they typically do not have significant resources to handle complex certificate trading or price forecasting, and their cash flow position pushes them to sell their certificates as soon as possible, even if the price achieved could in hindsight have been higher via another platform. Smaller biofuel producers will naturally have to trade-off between making longer term arrangements with obligated parties to sell their RTFCs often at a lower price, or to take the risk of trading on the open market with the chance that they may receive a higher price.

2.1.3 Total support for biofuels under the RTFO

The support for biofuels under the RTFO relates directly to the value of an RTFC. For biofuel producers without an obligation, the support for biofuels comprises the value they can derive from selling their RTFCs. Obligated parties have an obligation to supply biofuels, therefore for those parties the 'support' for biofuels is equivalent to the value of not paying the buy-out price plus any value recycled from the buy-out fund³⁶ after the end of the obligation period. Clearly obligated parties will make a commercial decision whether to supply their own biofuel (and therefore generate their own RTFCs), to purchase (or import) biofuel from another party and claim the RTFC for that biofuel, to purchase RTFCs from another party or via a trading platform, or to pay the buy-out price, or of course a combination of the above.

Small biofuel producers, who are typically producing biodiesel from UCO, have indicated that the transition from a guaranteed duty differential to an RTFC price, which is variable, is very difficult to manage. The support available for small UCO biodiesel producers is illustrated in Table 3.

³⁵ Refer to RTFO Biofuel Statistics reports, worksheet 'RTFO 04 Transfer of RTFCs'. Note that this data shows both *transfers* of fuel with RTFCs and the separate *trading* of RTFCs (i.e. without the fuel). See: <https://www.gov.uk/government/collections/biofuels-statistics>

³⁶ To date the buy-out fund recycling has been of limited value. Obligated fuel suppliers have typically either supplied biofuel, or surrendered RTFCs bought from the market rather than pay the buy-out price (these options have been cheaper than paying the buy-out price).

Table 3: Overview of level of support to UCO biodiesel producers over the lifetime of the RTFO. (Note that the duty differential ran from 1 April to 31 March rather than mid-month as the RTFO timeframes.)

Obligation year	Obligation year date	Duty differential (20p per litre)	Double counting for wastes?	Support
Pre-RED implementation				
1	15 Apr 2008 – 14 Apr 2009	All biodiesel	No	= 20p + 1xRTFC
2	15 Apr 2009 – 14 Apr 2010	All biodiesel	No	= 20p + 1xRTFC
3	15 Apr 2010 – 14 Apr 2011	UCO biodiesel only	No	= 20p + 1xRTFC
4a	15 Apr 2011 – 14 Dec 2011	UCO biodiesel only	No	= 20p + 1xRTFC
Post-RED implementation				
4b	15 Dec 2011 – 14 Apr 2012	UCO biodiesel only	Yes	= 20p + 2xRTFC
5	15 April 2012 – 14 April 2013	-	Yes	= 2xRTFC
6	15 April 2012 - 14 April 2013	-	Yes	= 2xRTFC

The duty differential provided biodiesel producers with a guaranteed level of support for the fuel (i.e. 20p per litre). However, the value of an RTFC is not fixed and, as indicated in Figure 6, can fluctuate widely from month to month, depending on the market. The value of certificates is affected by a number of factors, for example obligated suppliers can choose to import biodiesel and bioethanol to meet their obligation if it is cheaper to do so, rather than purchasing RTFCs³⁷.

As an illustrative example, the total 'support' level for a double counting biofuel such as UCO biodiesel, using high and low estimates for RTFC prices traded through NFPAS from Figure 6, is estimated to be³⁸:

- Pre-RED implementation (Year 1 – 4a): 31 to 44p per litre³⁹, 20p of which is guaranteed.
- Post-RED implementation (Year 4b): 36 to 47p per litre⁴⁰, 20p of which is guaranteed.
- Post-RED implementation (Year 5 onwards): 18 to 36p per litre⁴¹, none of which is - guaranteed. -

³⁷ <http://www.publications.parliament.uk/pa/cm201012/cmselect/cmenvaud/1025/1025vw08.htm>

³⁸ Our analysis considers the price of certificates traded during the actual period, rather than prices for certificates issued during a period (as this information is not published). For example, for Year 4b we consider certificates that were traded between December 2011 and April 2012, rather than certificates that were issued between those dates.

³⁹ Based on low of 11p per litre in September 2010, and high of 24p per litre in January 2011, with 20p per litre duty differential.

⁴⁰ Based on double counting with low of 8p per litre in March 2012, and high of 13.5p per litre in January 2012, with 20p per litre duty differential.

⁴¹ Based on double counting with low of 9p per litre in July 2012 and February 2013, and high of 18p per litre in March 2013, with no duty differential.

Due to the price that certificates were trading at, the support level for double counting biofuels was broadly comparable between Year 1 – 4a (Pre-RED implementation) and Year 4b (Post-RED implementation), but dropped in Year 5 by between 11p and 18p per litre with the removal of the duty differential. A further consideration is that support levels in Year 5 are not guaranteed (i.e. support is solely dependent on the market).

It should also be noted that, not only has the price of RTFCs been volatile, but in some months in Year 5 there have been no successful sales of RTFCs via the NFPAS auction (Figure 6). This is illustrative of the fluctuating demand for RTFCs reported by especially smaller biofuel producers. For producers selling their RTFCs in this way, a month with no RTFC sales will mean delayed cash flow and in the worst case might mean that they are not being able to sell some of their RTFCs at all. It is these risks which make smaller producers in particular report that banks are reluctant to provide loan guarantees against the value of the future RTFCs sold.

2.2 Issuance of RTFCs and cash flow implications

2.2.1 Process of issuing RTFCs

Biofuel producers (above a threshold of 2,500 litres per year⁴²) must report to HMRC the volume of fossil and biofuel supplied each month and must pay HMRC the duty on that fuel sold every month. When the RTFO was originally introduced in 2008, biofuel producers were also obliged to report carbon and sustainability (C&S) data to DfT on the biofuel component every month to claim their RTFCs. That C&S data was required to be independently verified on an annual basis.

Since RED implementation (December 2011) biofuel producers can choose how often (within the obligation year) they apply for RTFCs. Producers of course prefer to sell the RTFCs associated with their biofuel as quickly as possible for cash flow purposes. However since RED implementation, because the C&S requirements are now mandatory, producers are required to have their C&S sustainability data independently verified before applying to DfT for RTFCs.

2.2.2 Verification cost

When the change was made in the RTFO to require verification before issuance of RTFCs, there was concern that the cost of more frequent verification might be prohibitive, especially for smaller producers.

Smaller producers interviewed for this project indicated that the cost of verification is significant and, although the process is becoming easier over time, the cost per assurance engagement is not lower. One indicated that verifying on a monthly basis is in effect 12 times the cost of verifying annually.

⁴² <http://www.hmrc.gov.uk/manuals/hcobigmanual/hcobig4200.htm>

However, despite this, the small companies we interviewed said they still chose to apply for RTFCs on a monthly basis as this is necessary to maintain their cash flow. Companies also indicated that, between verification costs and cash flow, cash flow is the more significant challenge that they have to deal with.

The industry has also seen an increasing move to certification as this provides more certainty to those buying fuel or RTFCs further down the supply chain. Smaller biofuel producers who claim their own RTFCs can choose between getting certified to a voluntary scheme and therefore having a simplified ex-post verification, or having all of their C&S data checked ex-post by an external verifier. However, for those selling their fuel to obligated suppliers (i.e. not claiming their own RTFCs), or those selling the UCO feedstock to obligated suppliers, the market appears to be moving towards a requirement for certification as the standard. As an example the typical cost to a UCO collector or a small biofuel producer of an audit to an EC-recognised voluntary scheme is £2,000 per year⁴³.

It should be noted that the companies that were willing to speak to us about this issue of verification and certification are the companies who are still in business and are therefore managing to manoeuvre the RTFC process. Companies who have gone out of business may therefore have found the cost of verification a more significant issue, although it is still reported that cash flow remains the bigger problem. There are reports of small bioliquid generators under the Renewables Obligation choosing to generate electricity via bioliquids but not to apply for Renewables Obligation Certificates (ROCs) because the value gained does not justify the administrative burden. Although this does not appear to be the case so far under the RTFO, it highlights that small producers remain sensitive to administrative costs.

2.2.3 Cash flow implications

Cash flow was mentioned by almost all small biofuel producers interviewed for this project as the biggest issue that they have to manage. DfT are only able to issue RTFCs once biofuel has been independently verified and reported to DfT and once DfT has evidence that the duty has been paid to HMRC.

From the start of the RTFO, DfT has only issued certificates once HMRC has processed the returns and passed the confirmation of duty paid to DfT. According to the industry contacts we spoke to this process was typically taking up to three months if duty payment was made via the HO930 system⁴⁴. Furthermore, following RED implementation RTFCs are now only issued provided the producer has engaged a verifier to demonstrate that the fuel meets the RTFO sustainability criteria and submit a verifier's assurance statement attesting to this (previously verification could be undertaken annually).

⁴³ Based on the reported cost of an ISCC audit.

⁴⁴ http://search2.hmrc.gov.uk/kb5/hmrc/forms/view.page?record=2R3_gu5orn0&formId=3232

As standard payment terms in the UK are 30 days producers would effectively have to wait a further month before receiving money from the sale of RTFCs. To further exacerbate this banks are reportedly unwilling to provide loan guarantees against the value of the future RTFCs sold as the value is so uncertain. This situation is inevitably leaving many smaller biofuel producers with a significant cash flow problem.

In recognition of this, in January 2013 the DfT implemented changes to speed up the process of issuing RTFCs⁴⁵. DfT will now issue RTFCs on receipt of evidence from the applicant that the duty has been paid to HMRC (e.g. copy of the suppliers' bank statement), along with a verifier's assurance report, ahead of official notification of this from HMRC.

2.3 Other challenges facing biofuel producers

A number of stakeholders we contacted indicated that there are several other challenges that smaller biofuel producers are facing, one which relates to fuel quality. Producing a biodiesel which consistently meets the EN 14214 specification requires investment in advanced technology and generally speaking can only be achieved economically with a reasonable scale. This can be achieved by most of the small biofuel producers who are still producing and who were interviewed for this project. However the experience of one former biodiesel producer contacted was that it was very challenging to produce biodiesel to the required technical standard, which made it increasingly difficult to sell their fuel into the bulk market due to the very strict fuel specification requirements. This resulted in the company deciding to close the plant.

Off-spec fuel (i.e. not conforming to EN 14214) will not be purchased by obligated suppliers but can be sold to the captive fleet market. However, with the demise of the 20p per litre duty exemption it became more challenging to sell fuel at a competitive price.

2.4 Impact on smaller biofuel producers

The UKSBA undertook a survey of biodiesel producers in May and June 2013 to assess the impact of the removal of the duty differential and RTFC values and trading. The survey was sent to the UKSBA membership list and cross-referenced with the DfT Account Holders List (producers only). In total 40 producers were contacted.

Of the 22 respondents only 8 producers are still producing biodiesel. The remaining 14 have either closed, or are no longer producing road fuel (e.g. have switched to alternative markets). According to the UKSBA, only an additional 3 of the 18 non-respondents are known to be still producing. They

⁴⁵ RTFO Account Holders Communication 2013, No. 3, 17 January 2013

assume that the majority of the remaining 15 have now closed. Therefore, only 11 of the 40 producers contacted are still reported to be active (28%).

The UKSBA survey results appear to be validated by the level of activity of biofuel producers registered in the ROS. Our analysis indicates that of a total of 65 UK biodiesel companies registered in ROS, only 49 are still registered at Companies House with 10 companies either dissolved or in liquidation (the remaining 6 are no longer/not registered at Companies House). Of the 49 companies still registered at Companies House, we understand that:

- **14 are still producing biofuels:**
 - Mid to large companies (5): Argent Energy, Convert2Green Ltd, Greenergy Fuels Ltd, Harvest Energy and Olleco;
 - Small companies (9): Aeolus Partnership, Apple Oils Ltd (formerly Apple Fuels Ltd), Bio UK Fuels (Sheffield) Ltd, Britannia Biofuels, East Yorkshire Biofuels Ltd, Edible Oil Direct LTD (Rye Biofuels), Fyne Futures, Mex Technologies Ltd (BioCorp) and Pure Fuels Ltd;
- **3 have diversified into supplying bioliquids (and may also be supplying some biofuel):** Biofuel Refineries Ltd, ReFuel Energy Ltd (UK Renewable Fuels Ltd) and Uptown Biodiesel;
- **3 are concentrating on equipment sales:** A & V Squires Plant Co Ltd⁴⁶ (plant hire equipment), Green Fuels Ltd (biodiesel equipment) and Regenattec Ltd (control modules for truck engines);
- **2 are no longer producing biofuel and have moved into biofuel R&D:** Biomotive Fuels Ltd and Organic Drive Ltd;
- **2 are now focussing on waste oil collection:** Double Green Ltd (now trading as - Brocklesby Ltd) and Proper Energy Ltd (Proper Oils); -
- **1 is no longer producing biofuel and has diversified into selling water meters:** ABAKO (formerly Associated British Biofuels Ltd);
- **1 is no longer producing biofuel and has diversified into selling wood pellets:** Devon Biofuels;
- **1 has significantly reduced its biofuel production since the removal of the duty differential but is launching a new initiative centred on community UCO collection:** Dorset Bio Solutions CIC⁴⁷;
- 1 is known to have ceased trading and the exact status of the remaining 21 companies is not known, although there has been no recent activity on their ROS accounts.

⁴⁶ A & V Squires produce biodiesel to power their fleet of lorries, vans and plant vehicle (rather than for general sale).

⁴⁷ This is a local oil recycling initiative using the 'Eko Funnel' which will be distributed to local schools. See: <http://www.dorsetbiosolutions.co.uk/>

2.5 Case studies of small UK biofuel producers

We contacted a number of biofuel companies during the preparation of this report to investigate the challenges faced by smaller biofuel producers. A selection of companies are included below as case studies. These case studies serve to highlight the specific challenges that the companies have faced, and also describe how the companies have adapted their business models to deal with these challenges.

2.5.1 Biomotive Fuels

Biomotive Fuels, based near Basingstoke, was set up in 2008 with the aim of producing quality biofuel from UCO. The company originally started off supplying UCO biodiesel to a local bus company who at the time were utilising pure plant oil (rapeseed PPO) and finding problems sourcing PPO fuel of the right quality and price. Biomotive then switched to producing a refined UCO for the bus company as the biofuel became uneconomically viable and the duty differential for biodiesel other than from UCO was removed. Unlike most other smaller producers supplying conventional biodiesel, Biomotive produced refined UCO (referred to as 'pure UCO' or 'straight UCO'/'S-UCO'), which could be used in a diesel engine with some minor additional technology.

The company entered into an arrangement with United Biscuits in 2010 to collect waste oil from their factories, convert their trucks and supply them with S-UCO in a closed-loop system. This worked well initially and the arrangement lasted for 2 years while further similar HGV operators were approached to replicate the success. However the combined effect of the duty differential removal with a lower RTFO certificate price after doubling counting was introduced meant that the business lost approximately 13-14p per litre on fuel sales. Left with such uncertainties and risks to developing the business, the business struggled with an unprofitable business model to maintain bank finance and a decision was taken to close Biomotive's plant and lay-off staff.

Biomotive has now down-scaled but still firmly believes in the benefits of their innovative fuel concept and continues to work hard to find ways to develop it further. In 2012 Biomotive with United Biscuits secured a DfT/Technology Strategy Board (part-)funded project (Low Carbon Truck Demonstration Trial) to demonstrate the environmental and performance impact of their S-UCO biofuel solution in 44-tonne trucks. Biomotive provide project management of the United Biscuits led consortium, along with the University of Leeds and are supported by a number of partner companies (including Bioltec GmbH, Fuchs Lubricants UK Plc, The AA, Convert2Green,)⁴⁸. The S-UCO fuel for the project is produced by Convert2Green in Cheshire.

⁴⁸ <https://connect.innovateuk.org/documents/3029109/3794733/Low+Carbon+Truck+Demonstration+Trial+-+funded+projects.pdf/69200457-0d53-4e01-830d-f733b2436059>

2.5.2 Brocklesby Ltd

After initially operating a biodiesel plant in the early years of the RTFO (under the name Double Green), Brocklesby now focuses on the collection of UCO and other waste oils. Brocklesby primarily collects UCO from food manufacturers in the UK and Ireland and operates a fleet of 20 dedicated 44 tonne articulated lorries. Brocklesby do not collect from caterers or restaurants, in contrast to most other companies operating in the UCO market. As discussed in section 1.1, Brocklesby is involved in a joint venture with Greenergy in a 50,000 tonne output pre-processing plant, located at North Cave near Hull. This plant takes higher FFA material which is pre-treated before being sent to the Greenergy plant for conversion to biodiesel⁴⁹. Lower FFA material that is collected is sent to biodiesel producers, like Greenergy, directly.

Brocklesby is also actively involved in the collection and processing of food waste with high oil content. In 2013 it commissioned an innovative processing facility that extracts oils and fats from the waste streams produced by food manufacturers and expect to be processing 1,000 tonnes per week. The company sees further potential in this area and is ready to significantly increase production capacity in 2014.

Brocklesby employs around 60 people, of which 15 are laboratory staff or admin, 20 are drivers and the balance (25) are plant operatives.

2.5.3 Devon Biofuels

Devon Biofuels was set up with the aim of producing biodiesel for local use, but has recently diversified into the production of bio-logs and wood pellets. According to Herbert Hooper, the owner of Devon Biofuels, the main driver for this was the removal of the duty differential, compounded by an increase in the price paid to UCO collectors of around 10 pence per litre. As a result the company was no longer able to produce biodiesel at a competitive price.

2.5.4 Proper Oils

Proper Oils was set up in April 2007 to collect UCO from caterers in London and refine it to biodiesel (they also supply virgin oils to their client base). However, the company has now adapted its business model to primarily focus on the collection of UCO, which they then sell on to biodiesel producers (mainly within the UK). According to Stephen Hurton, Director at Proper Oils, the driver for this was the change in the duty regime which made it very difficult for them to make biodiesel profitably at a local scale. Proper Oils has expanded its collection base from London to cover the South East of England through its acquisitions of KT Eco Oil in August 2013 and Footprint Fuels (a former London based biodiesel producer) in April 2013⁵⁰.

⁴⁹ It would not be feasible or efficient for Greenergy to process the material directly.

⁵⁰ <http://www.properoils.co.uk/purchasing-another-cooking-oil-collection-business/>; <http://www.properoils.co.uk/proper-oils-expands-with-the-acquisition-of-footprint-fuels/>

2.5.5 Uptown Biodiesel

Uptown Biodiesel is a London based biodiesel producer that started operating in 2007. The company produces biodiesel from UCO, which is collected from over 1,200 locations across London (principally pubs). It also delivers virgin vegetable oil to its collection base, creating a virtuous circle of oil supply and collection. Production capacity is currently at around 70,000 litres per week. The fuel conforms to the EN 14214 standard and is sold as B100.

The company was set up to supply road transport fuel and until recently was supplying most of its fuel to the London taxi fleet as well as to hauliers. However, with the removal of the 20p duty differential Uptown are no longer able to supply fuel at a sufficiently competitive rate compared to conventional diesel⁵¹. As a consequence, demand for fuel has dropped off significantly from this market and between March and August 2012 Uptown was producing less than 20,000 litres per month of road fuel.

Uptown began to explore options to diversify to alternative fuel markets in anticipation of the change in duty differential for road transport and the expected impact this would have on their business. In 2012 they secured a contract to supply PWC with biodiesel for its office at 7 More London Riverside. Uptown supply PWC with 18,000 litres per week of biodiesel, equivalent to 26% of its total production. The biodiesel is used to generate 25% the total energy used, via a tri-generation system, and provides heating and cooling around the building. According to Jason Askey-Wood, Director at Uptown, the long-term viability of the company would have been placed in serious doubt if they had not secured this contract.

Uptown currently employ 20 full time staff, including 9 collectors who operate a fleet of 9 vans. The company had previously intended to expand production to 30 full time staff, but this has been delayed.

According to Uptown Biofuels the only other biofuel producer still in operation in London is Pure Fuels. They indicate that a number of other biofuel producers, including Biodiesel London, Footprint Fuels and Greener Diesel are no longer in operation following the removal of the duty differential for UCO.

⁵¹ Although the fuel is still cheaper than fossil diesel it may not be worth the effort (time and cost of fuel) to use Uptown, particularly for hauliers which are based outside of London.

3 - Industry recommendations for improvement of RTFO

The industry representatives we spoke to provided a number of recommendations for improving the RTFO. These are discussed in turn below:

- **'Splitting' the obligation:** Both Harvest Energy and Olleco (as well as the UKSBA) strongly recommend that the RTFO obligation is split into separate obligations for bioethanol and biodiesel. Since the obligation is 'volume' based, obligated fuel suppliers will inevitably source the cheapest fuel by volume. Currently this favours the use of imported cheaper bioethanol over biodiesel⁵². Stakeholders considered that a separate obligation would create a more level playing field and provide a more certain market for producers. Note that separate obligations for bioethanol and biodiesel are a feature of the systems in the US and some European Member States (including Germany, Austria and Spain). Some other Member States (including Finland and the Netherlands) have 'energy' based biofuel obligations. This type of obligation indirectly favours the supply of higher energy density fuels (like biodiesel)⁵³.
- **Obligation trajectory:** The UK has committed to the EU Renewable Energy Directive target of 10% (energy basis) of renewable fuel in transport by 2020. However, the RTFO currently only sets a target of 4.75% (volume basis) in 2013/14, with no forward trajectory up to 2020. Stakeholders (including Harvest Energy, Uptown Biodiesel and the REA) consider that this is limiting further investment in the UK biofuel industry, including investment in new plant and also infrastructure to target novel and waste feedstocks.
- **Minimum RTFC price:** Under the RTFO obligated suppliers can either choose to supply biofuel, purchase RTFCs or "buy-out" of their obligation rather than supply biofuel. The buy-out is fixed at 30p per litre, however there is no minimum price for RTFCs. Stakeholders considered that this unfairly protects the obligated parties as they have flexibility of meeting the obligation in the cheapest way. On the other hand, the biofuel producers have no guaranteed price for the certificates. Introducing a minimum price is one of the UKSBA's key recommendations for improving the RTFO. They suggest setting a minimum price of 15p per litre.
- **Award of additional RTFCs for high blend biofuels:** The UKSBA also recommends awarding additional RTFCs (e.g. 3 x RTFCs) for captive fleets running on waste oil B100

⁵² Currently bioethanol sold at petrol stations in the UK is restricted to E7 (i.e. a blend of 7% bioethanol and 83% gasoline). This so-called "blend wall" has indirectly served to limit the supply of bioethanol. However, in 2014 the UK intends to permit the supply of E10, which may further increase the reliance on bioethanol by obligated fuel suppliers to meet their RTFO obligation.

⁵³ The calorific value of biodiesel (FAME) is around 37 MJ/kg, compared to around 27 MJ/kg. Source: Renewable Energy Directive

biodiesel. Captive fleets, such as haulage and delivery trucks, are particularly difficult to decarbonise in any way other than high blend biofuels and additional support would boost the use of biofuels in this sector which will be necessary to decarbonise the transport system in the medium to long term.

- **Tax differential for UK UCO B100 producers:** Similar to the option above, Uptown Biodiesel proposed that HMRC could consider applying a tax differential of 20p per litre for UCOME produced from UCO collected in the UK and supplied as a pure fuel (i.e. B100).
- **RTFC carbon linkage:** Under the current RTFO system no additional certificates are awarded for supplying biofuels with greenhouse gas emission (GHG) savings higher than the mandatory 35% target under the RED. Linking the number of RTFCs to the GHG saving achieved, or more simply rewarding fuels which meet very high GHG savings (e.g. 80+%) with additional RTFCs would stimulate demand for biofuels like UK UCOME biodiesel and advanced biofuels. The REA has previously advocated for introducing carbon linkage in the RTFO. Germany intends to introduce carbon linkage in its biofuels national system in 2015, whilst at the same time intending to remove the double counting mechanism for wastes and residues.
- **Incentivise collection and recovery of wastes:** One stakeholder⁵⁴ suggested that, rather than incentivising the supply of biofuels from wastes, which does not distinguish between collection of more UK wastes and importing wastes, incentivising the collection and recovery of additional waste streams would have a larger impact on sustainability. Examples could include working with local councils to share best practice in domestic collection of UCO, to provide funding directly to support UCO collection, or to provide R&D funding for novel oil recovery systems such as oil from food waste streams.
- **Pre-approval of fuel:** Two obligated parties indicated that DfT's right to revoke RTFC up to 18 months after issuance, even in the instance that the fuel was certified to a voluntary scheme, hinders the tradeability of RTFCs. One stated that the "whole concept of tradable RTFCs relies on [the certificates] being tradeable. The market over last 12 months has been paranoid". The fuel passes the duty point and is therefore effectively already sold before you know whether the RTFCs will be issued. One stakeholder suggested a pre-approval system for fuel as in the Netherlands.

⁵⁴ Warwick Lywood, Lywood Consulting

4 Observations and conclusions -

- **UK biofuel production capacity and actual production:** The total UK biofuel production capacity is in excess of 1,500 million litres per year, of which 60% is bioethanol and 40% biodiesel (with a small volume of biomethane). However, actual production has been significantly below capacity to date. There is currently limited investment in new plant planned beyond 2013.
- **Employment:** A joint study by the REA and Innovas estimates that the UK biofuel industry supports 3,500 jobs across the supply chain (production, supply and distribution – but not including feedstock collection). Our analysis indicates that around 517 people are directly employed at the main UK biofuel plants (as indicated in Table 2). Additionally jobs in, for example, farming, transport and distribution will be supported by the industry. We estimate that several thousand in addition are supported by the UCO collection industry.
- **Status of the biodiesel industry:** A UKSBA survey of 40 UK biodiesel producers reports that only 11 are still producing biofuel for road transport (28%). The UKSBA estimates that of the remaining 29, 15 are thought to have closed and 14 are known to have either closed or be primarily producing biofuel for other markets. Our analysis indicates that of a total of 65 UK biodiesel companies registered in ROS, only 49 are still registered at Companies House with 10 companies either dissolved or in liquidation (the remaining 6 are no longer/not registered at Companies House). Of the 49 companies still registered at Companies House, we understand that:
 - 14 are still producing biofuels;
 - 3 have diversified into supplying bioliquids;
 - 3 are concentrating on equipment sales;
 - 2 are no longer producing biofuel and have moved into biofuel R&D;
 - 2 are now focussing on waste oil collection;
 - 1 is no longer producing biofuel and has diversified into selling water meters;
 - 1 is no longer producing biofuel and has diversified into selling wood pellets;
 - 1 has significantly reduced its biofuel production since the removal of the duty differential but is launching a new initiative centred on community UCO collection;
 - 1 is known to have ceased trading and the status of the remaining 21 companies is not known, but they are not currently active in ROS.
- **Issues faced by smaller biofuel producers:** Cash flow was mentioned by almost all small biofuel producers interviewed for this project as the biggest issue that they have to manage.
 - One of the main factors behind this was the extended period it took for producers to receive their RTFCs (initially they would only issue certificates upon confirmation from HMRC that the duty had been paid); although the DfT implemented changes to speed up the process of issuing RTFCs in January 2013.

- A further factor impacting cash flow has been the volatility in the RTFC price. For example, Year 4 certificates traded by NFPAS ranged in price from a high of 23p per litre in November 2011 to a low of 5p in November 2012. Furthermore, in some months demand for certificates has been very limited, so producers may not even be able to sell their RTFCs. On this basis banks are reluctant to provide loan guarantees against the value of the future RTFCs sold as the value is so uncertain. Smaller biofuel producers typically have to trade-off between making longer term arrangements with obligated parties to sell their RTFCs often at a lower price, or to take the risk of trading on the open market.
- Finally, the double counting of biofuels produced from wastes has only partly compensated for the removal of the duty differential for UCO biodiesel in April 2012. Pre-double counting the total support level for UCO biodiesel (based on NFPAS published RTFC trading data) was around 31 to 44p per litre (20p of which was guaranteed). Support in Year 4b, following implementation of the RED, was at 36 to 47p per litre (20p of which was guaranteed), but then dropped after the removal of the duty differential to around 18 to 36p per litre (none of which is guaranteed).
- **Industry recommendations for improving the RTFO:** The stakeholders we contacted provided a number of recommendations for improving the RTFO. The UKSBA's key recommendations are to implement a minimum price for RTFCs of 15p per litre and to award additional RTFCs for high blend fuels (B100). A number of mid-sized biodiesel producers advocate splitting the RTFO obligation into separate obligations for bioethanol and biodiesel to provide a more certain market for producers. Other recommendations included extending the biofuel trajectory up to 2020, introducing RTFC carbon linkage and introducing a tax differential for UK UCO B100.

5 Stakeholders who provided input

1. Jason Askey-Wood, Uptown Biodiesel
2. Adam Baisley, Olleco
3. Robert Brocklesby, Brocklesby Ltd (and Greenergy)
4. Brian Butler, Dorset Bio Solutions CIC
5. Jim Ebner, Biomotive
6. Herbert Hooper, Devon Biofuels
7. Stephen Hurton, Proper Oils
8. Tom James, Organic Drive Limited
9. Patrick Lynch, Greenergy
10. Warwick Lywood, Lywood Consulting
11. Tracey O'Keefe, UK Sustainable Bio-diesel Alliance (UKSBA)
12. Dickon Posnett, Argent Energy
13. James Ross, Harvest Energy
14. Robert Vierhout, E-pure
15. Ian Waller, FiveBarGate
16. Clare Wenner, Renewable Energy Association
17. Phil Yates, Vegetable Oil Management Ltd

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