

# Mapping and understanding the UK palm oil supply chain

## Proforest

A research report completed for the Department for Environment, Food and Rural Affairs



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## **Mapping and understanding the UK palm oil use EV0459**

### **Final Report to the Department for Environment, Food and Rural Affairs**

April 2011

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# Glossary

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<b>Defra</b>	Department for Environment, Food and Rural Affairs
<b>GreenPalm</b>	An RSPO certificate trading programme, which end users can purchase certificates from RSPO certified producers equivalent to the volumes of sustainable palm oil, palm kernel oil and palm kernel meal used in end products.
<b>Oleochemicals</b>	Chemicals derived from oils are called oleochemicals. There are five basic oleochemicals: fatty acids, fatty alcohols, fatty methyl ester, fatty nitrogen compounds and glycerine. These palm-based oleochemicals appear in products such as candles, cleaning products, rubber, and in skin care products including lotions, shampoos and body oils.
<b>Palm Mid Fractions</b>	Another product of the double-fractionating process, palm mid fraction commonly appears in the manufacture of margarine and snack foods.
<b>Palm Olein</b>	At the first stage of fractionating, palm oil is split into two products: liquid palm olein and solid palm stearin. The fluid part of pure palm oil, liquid palm olein is naturally liquid at room temperature in warm climates. Widely used for frying foods, it blends well with other vegetable oils and is valued for its resistance to oxidation and the long shelf life it lends to foods fried in it.
<b>Palm Stearin</b>	Solid palm stearin is the solid part left after liquid palm olein is removed during the splitting process. As its name implies, the solid consistency of palm stearin makes it useful in the production of margarine and shortening and in baked goods requiring the use of hard fats.
<b>Superolein</b>	Palm oil derivatives can be further split a second time to produce double-fractionated palm olein. Also called “superolein,” this derivative cooking oil provides clarity and pourability in temperate climates and blends well with various seed oils.
<b>FFB</b>	Fresh Fruit Bunches
<b>PKM</b>	Palm Kernel Meal (also called Palm Kernel Expeller, or PKE)
<b>PKO</b>	Palm Kernel Oil
<b>CPO</b>	Crude Palm Oil
<b>RBD</b>	Refined, Bleached, Deoderised
<b>RSPO</b>	Roundtable on Sustainable Palm Oil



# Executive Summary

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The objective of this report is to provide a detailed understanding of UK palm oil consumption and thereby to provide the background information necessary for the implementation of potential government policy options, aiming to increase the proportion of sustainable palm oil consumed in the United Kingdom. It also seeks to inform the related approaches of external organisations such as businesses and NGOs.

Palm oil and its derivatives have been the focus of much attention over the past few years, in terms of the environmental and social impact of oil palm plantations, particularly with respect to the rapid expansion of the planted area. Much of the criticism of oil palm plantations has focussed on Indonesia and Malaysia, where some plantations have been established on peatland (which has potentially serious implications for GHG emissions), at the expense of high conservation values (particularly valuable forest areas) and land rights.

The Roundtable for Sustainable Palm Oil (RSPO) was set up in 2004 with the aim of developing a sustainability standard and a certification system to bring certified sustainable palm oil to market, and is currently the main tool available to identify and source sustainable palm oil. The system includes physically certified palm oil as well as tradable GreenPalm certificates. However, concerns have been raised that the market demand for sustainable palm oil is not as high as expected. RSPO figures for 2010 show that although the situation is improving, only 56% of globally available certified palm oil was purchased in 2010 ( up from 25% in 2009). Figures are lower for palm kernel oil, with only 27% of the available total purchased to date. No RSPO certified palm kernel meal (including GreenPalm PKE credits) had been purchased at the point this report was written.



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## UK import of palm oil and palm kernel meal

The UK imported a total of 643,400 mt (metric tons) of palm oil in 2009, (including 595,300 mt of palm oil and 48,100 mt of palm kernel oil), which is equivalent to approximately 1.2% of the 44.5 million mt palm oil and 5.4 million mt of palm kernel oil in global production. For palm kernel meal, the UK imported 663,300 mt in 2009, approximately 10% of the 6.5 million mt global output of PKM.

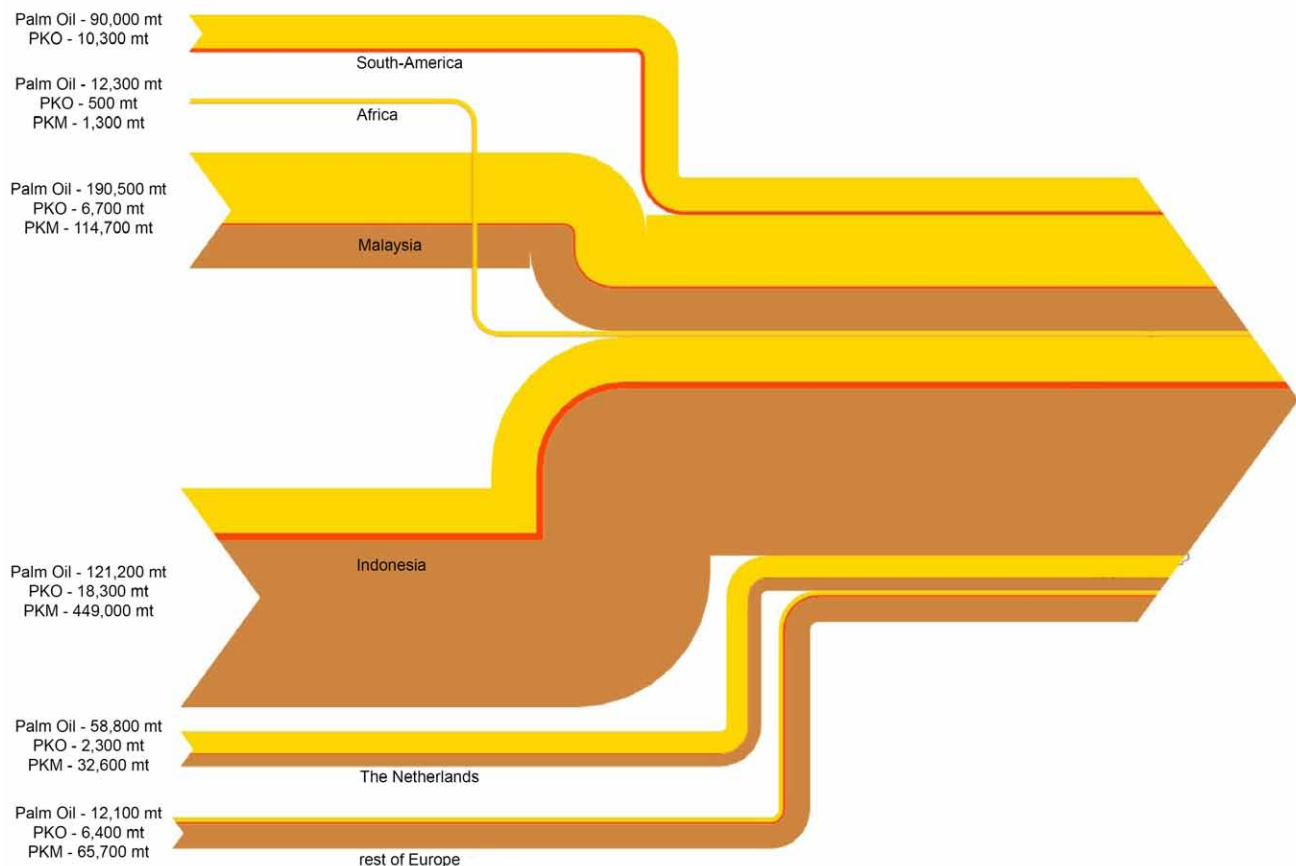


Figure A. Import of palm oil, palm kernel oil and palm kernel meal into the UK (2009)

Approximately 12% of palm oil that was imported to the UK in 2009 was from European countries (mainly the Netherlands), and 88% from producing countries (mainly Indonesia and Malaysia). Close to 70% of the palm kernel meal was imported from Indonesia (Figure A). This information is from trade data, and can be considered as robust figures. The quantities of palm oil imported to the UK have decreased by 40% over the past five years. Reasons for this may include changes in commodity prices, food manufacturers actively seeking to reduce saturated fats (e.g. dramatic reductions in palm olein used for crisp frying), and use of palm methyl ester for biodiesel (dropped by 50% between 2009/10 and 2010/11).

A significant proportion of finished products that contain palm oil are imported into the UK every year, estimated to be somewhere in the order of 190,000 - 350,000 mt, adding 30 – 50% on to the total use of palm oil in the UK. These are not included in Figure A.



## Sustainable palm oil

The UK has imported an estimated 40,000 metric tons (mt) of certified sustainable palm oil from producing countries, as well as around 15,000 mt of certified sustainable palm oil from other European sources. Furthermore, it is estimated that UK companies have purchased around 100,000 metric tons (mt) of GreenPalm certificates. Together this accounts for around 155,000 metric tons (mt) of RSPO palm oil, which is around 24% of current UK imports.

The European refining sector is well positioned to deliver RSPO certified material to the UK market, as all four key refineries in Rotterdam have integrated supply chains linked to plantations currently producing almost 1.5 million mt/year of RSPO certified palm oil. The UK sector is less integrated, with only one out of the four refineries with an integrated supply chain back to certified plantations (which could be processing up to 170,000 mt/year RSPO certified palm oil within the next year). The current integrated supply chains could theoretically deliver 36% of the UK's current palm oil imports as RSPO certified within a short timeframe.

A number of companies operating in the UK have made commitments to source sustainable palm oil with many of them committed to 100% RSPO certified by 2015. Research undertaken as part of this project suggests they have made good progress; those who shared data had collectively reached about 80% of their targets. If the 2015 target is met by these companies, it is expected that around 244,000 mt of the UK import of palm oil would be sustainable, which is equivalent to 37% of the total import, and over 40% of the estimated volumes used in the food sector (although data was collected from a sample of companies, and therefore this could be an underestimate).

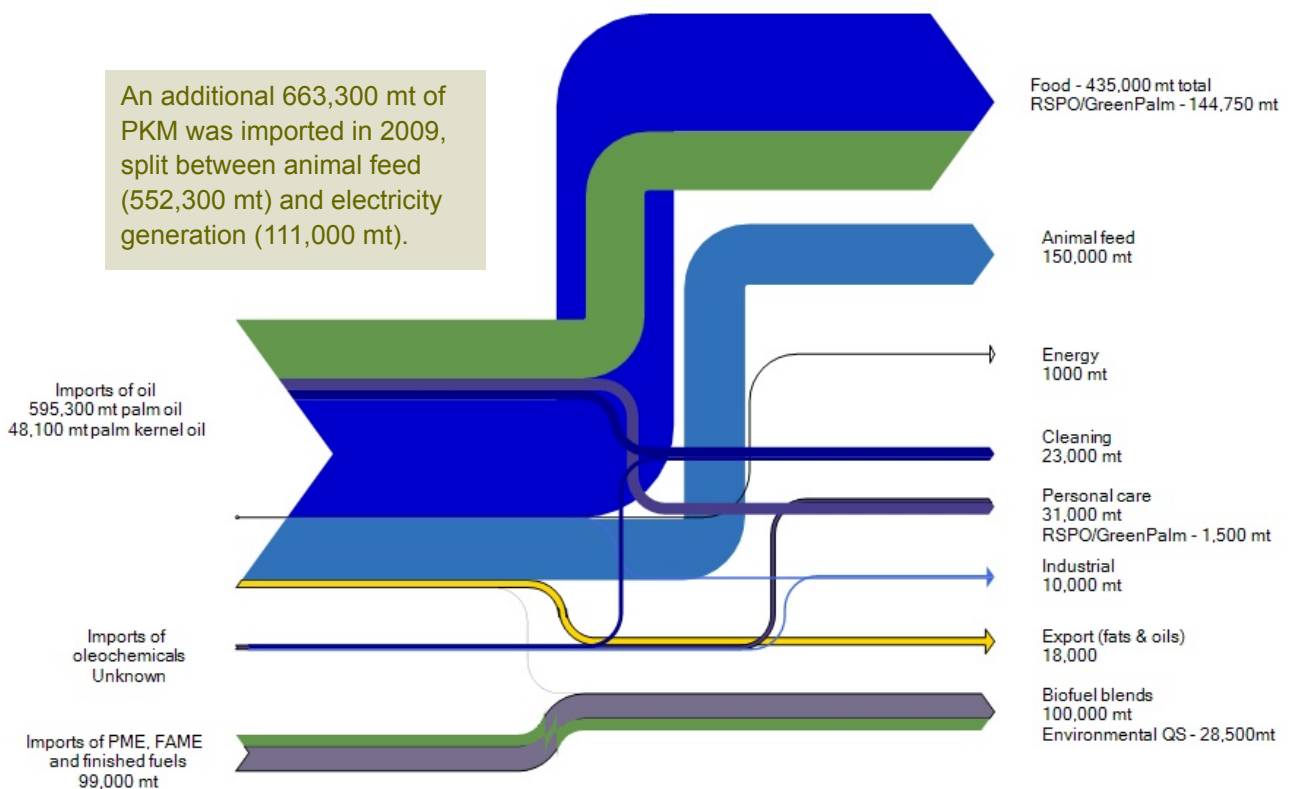


Figure B. Estimated use of palm oil by sector in the UK (2009/10), not including import of finished products or palm kernel meal

<sup>1</sup> Equivalent to 231,100 mt: 58,800 mt palm oil and 2,300 mt palm kernel oil from the Netherlands, assuming 170,000 mt from New Britain Oils in the UK

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The mapping study also identified how palm oil and fats are used in UK supply chains by sector. The information in the report was collected from a range of sources including trade data, reports and information from the internet and interviews with companies and organisation working in the sector.

The figures on import of palm oil, palm kernel oil and palm kernel meal are from trade data and are therefore robust. The allocation by sector and subsector are based on a variety of data which in some cases was fragmented, incomplete or anecdotal. These figures aim to provide an indication of magnitude rather than accurate numbers.

The sector figures for electricity and biodiesel are based on government data (mandatory reporting frameworks), food and feed on interviews, publicly available data and reports and include extrapolation based on estimated market share. They are likely to be accurate in terms of order of magnitude, but more detailed numbers are estimates (Figure B). The estimates for the sectors containing oleochemical derivatives (cleaning, personal care, cosmetics and industry) should be treated with particular care, as the origin of the feedstock is rarely known, and these figures have been derived from sources of varying robustness.

Use of palm oil in the food sector is estimated to be equivalent to 68% of the total import of palm oil. Taking into account palm oil used in animal feed (equivalent to 23% of the total), the food sector is estimated to use over 90% of the imported palm oil. Biscuits make up the largest share of this, likely using over 20% of the total import of palm oil. Frying fats, snacks, confectionary and dairy and dairy replacers also use significant quantities of palm.

Cleaning, personal care, cosmetics and industrial uses consume significant palm derived ingredients, comprising the remaining 10%. However, these ingredients are for the most part oleochemical derivatives which are chemically modified fats, where the original feedstock is not known (but expected to be palm kernel oil in a high proportion of cases). Biofuels derived from palm oil are almost all imported as methyl esters, and thus use little (if any) of the palm oil imported into the UK.

Over 80% of the imported palm kernel meal is used for animal feed, with the remaining 20% going into electricity generation.



*Palm oil is used in the food, cleaning, personal care, cosmetics and industrial sectors*

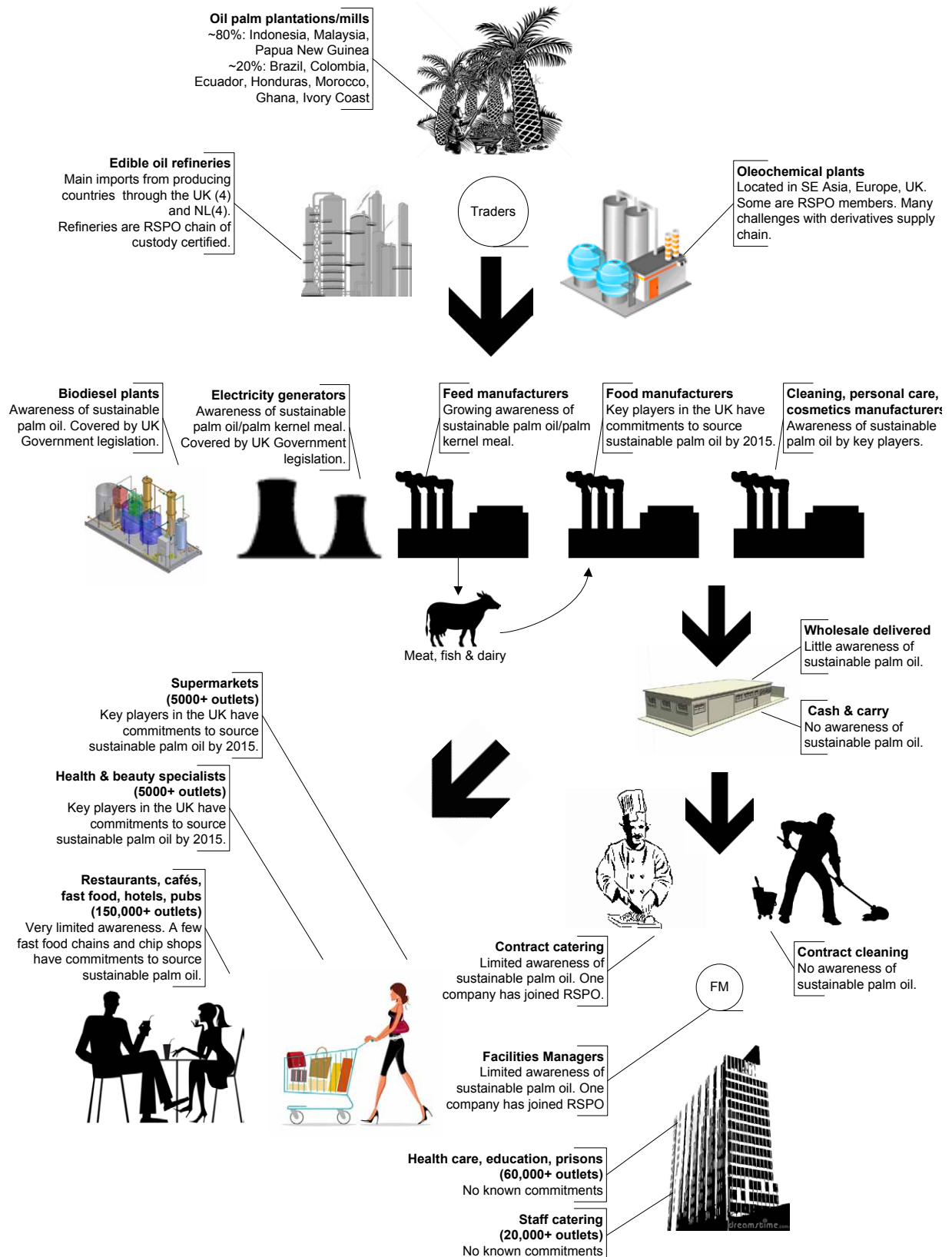


Figure C. Overall structure of UK palm supply chains, including key commitments

## Consumption

It is estimated that just under half of all imported palm oil (315,000 mt) reaches end users through retail outlets. This includes food as well as cleaning, personal care and cosmetic products. The retail sector has shown strong commitment to sourcing sustainable palm oil, with all of the major retailers committing to sourcing sustainable palm oil for their own-brand products (either RSPO certified or GreenPalm) by 2015 or sooner. However, these commitments do not include branded products, which are estimated to account for 80% of product lines.

The service industry includes restaurants, pubs and hotels as well as provision of facilities management (FM), contract catering and cleaning to the public and private sector estate. They key players in the service industry are the FM providers and the wholesale delivered distribution network, which is starting to show awareness of sustainability of palm oil. Together, this industry accounts for around 150,000 mt of palm oil use. Of this, it is estimated that 30 -50% quantities of palm oil can be attributed to the public sector, equivalent to 45,000 - 75,000 mt of palm oil. This represents 7% - 12% of the total import of palm oil and palm kernel oil into the UK (using 2009 figures, expected to be similar for 2010 and 2011) (Figure D).

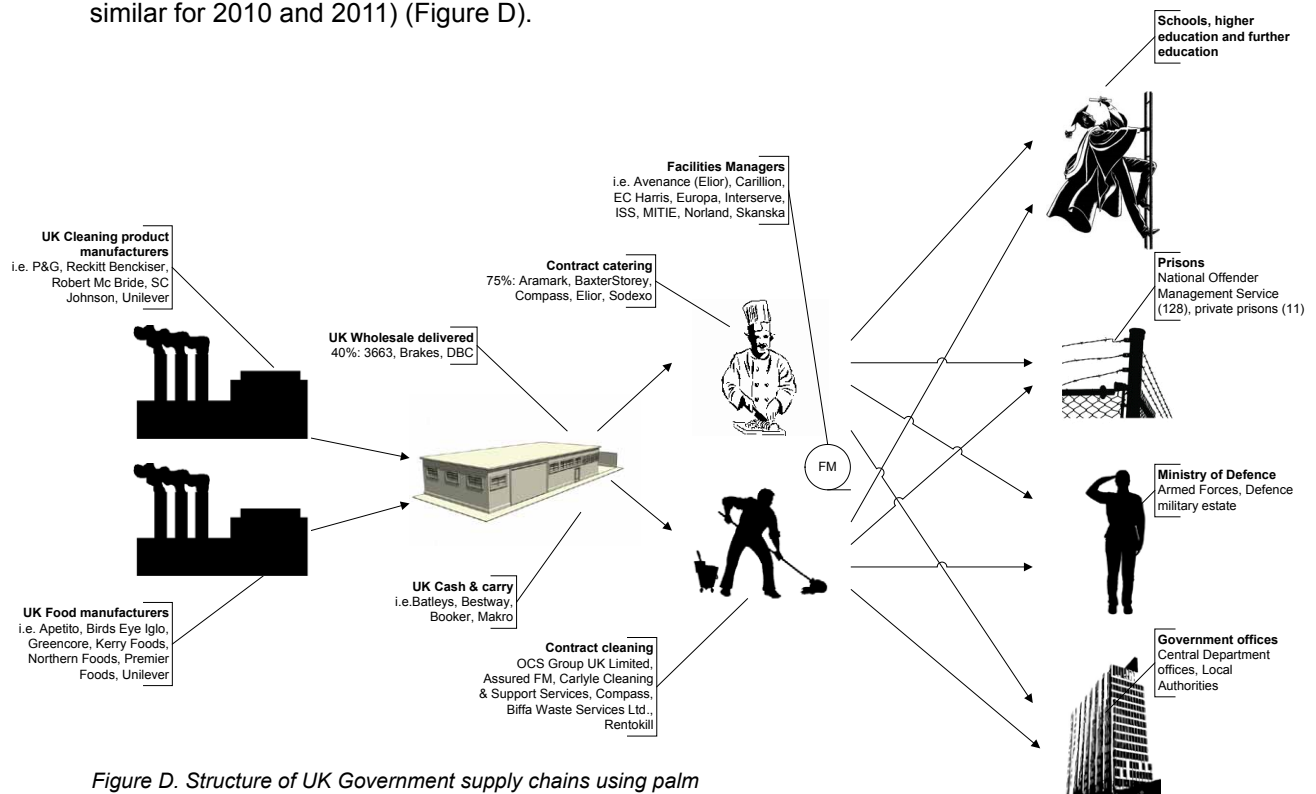


Figure D. Structure of UK Government supply chains using palm

Palm oil is also consumed indirectly by final consumers (where the palm product is not physically an ingredient or not a visible ingredient). Examples include animal feed, which is not an ingredient in the end product or industrial uses where palm oil is used as part of an intermediary process, but not contained in the end product (for example, industrial lubricants used in manufacturing machinery). Energy is another example where palm oil and palm kernel products are used indirectly by end consumers. These indirect uses are estimated to account for around 25% of the consumption of palm oil imports and 100% of palm kernel meal imports. Limited steps have been taken in the energy sector as a result of legislation, but none of the other indirect use sectors show any significant movement towards commitments to sustainable sourcing of palm oil and palm kernel meal.

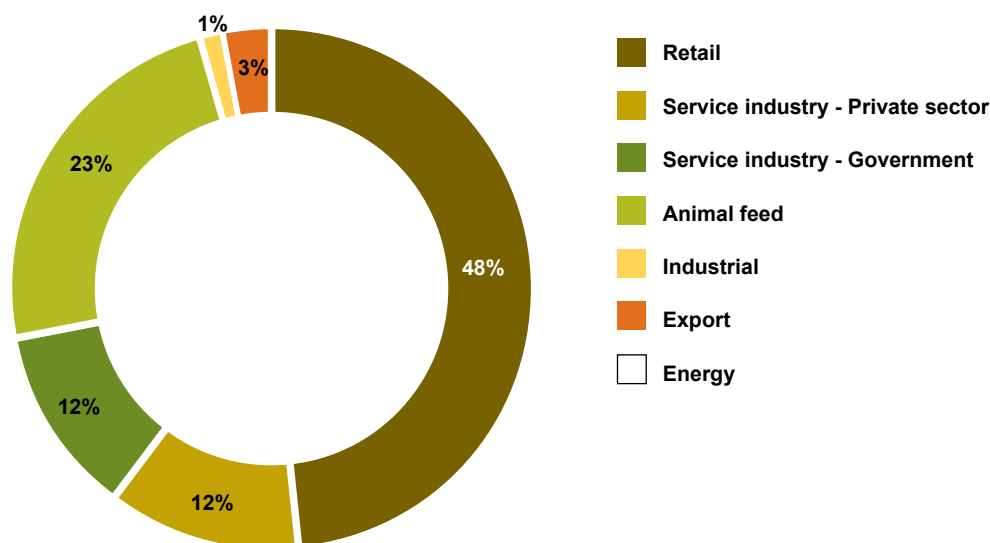


Figure E. Estimated consumption of palm oil in the UK

## Critical leverage points

The points in the supply chain where there are the fewest operators handling the highest volumes can be considered critical leverage points. Potentially significant leverage points include the following:

- There are currently four refineries in the UK, one of which has an integrated supply chain back to RSPO certified supply chains, another of which has recently been purchased by a company with oil palm plantation interests and a third that owns and operates the RSPO GreenPalm trading platform. Refined palm oil is also imported from a small number of vertically integrated companies, concentrated in the Netherlands.
- The food manufacturing industry is also highly consolidated, with much of the food supplied to retailers and the service industry coming from a handful of players which in some cases control upwards of 80% of the market for specific food categories.
- For cleaning and personal care, whilst there are a few large players, they are being limited by the availability of palm derivatives such as surfactants, glycerine and emulsifiers from sustainable sources. In this case, the critical leverage points are the oleochemical manufacturers. Significant changes towards a sustainable palm supply may require changes in the way oleochemical derivatives are traded.
- For the energy and biofuel sector, there are a limited number of fuel and energy companies operating in the UK. Global trading houses such as ADM, Bunge, Cargill, Dreyfus and Wilmar control much of the world's commodity flows.

The end users, including consumers of retail and foodservice, as well as public and private sector companies contracting catering and cleaning services have a role to play in terms of market signal, but the point at which the products are being formulated provides a much more direct influence. The specifiers are the retailers (for own-brand products), the wholesale delivered companies (who also have own-brand) and the manufacturers themselves.

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The public sector, while a comparatively small consumer of palm oil, can use its mandatory Government Buying Standards and framework contracts as levers of change across the public sector.

While this research shows the UK is already on its way towards consumption of sustainable palm oil, there are still challenges that lie ahead. Identifying and characterising the UK's palm oil supply chains, and the opportunities for leveraging change in the supply chain, as detailed in this body of work, is an important step in moving the UK towards a situation where the palm oil and palm kernel meal used is sustainable.



# 1. Introduction

The objective of this report is to provide background information for the process of developing potential government policy options, aiming to increase the consumption of sustainable palm oil in the United Kingdom. It also seeks to inform the approaches of external organisations such as businesses and NGOs.

## 1.1 Context

Palm oil and its derivatives have been the focus of much attention over the past few years, in terms of the environmental and social impact of oil palm plantations, particularly with respect to the rapid expansion of the planted area. Much of the criticism of oil palm plantations has focussed on Indonesia and Malaysia, where some plantations have been established on peatland (which has potentially serious implications for GHG emissions), at the expense of high conservation values (particularly valuable forest areas) and land rights.

The Roundtable for Sustainable Palm Oil (RSPO) was set up in 2004 with the aim of developing a sustainability standard and a certification system to bring certified sustainable palm oil to market. A multi-stakeholder approach was used, bringing together producers, retailers, traders, NGOs and other stakeholders. The RSPO certification scheme is now up and running, with both production and chain of custody certificates having been issued. The total volumes currently available are 3,828,160 mt/yr RSPO-certified sustainable palm oil and 887,966 mt/yr RSPO-certified sustainable palm kernels.

Many major UK and international businesses that use or sell palm oil have made commitments to 100% sourcing of sustainable palm oil by a given deadline, generally 2015.

However, concerns have been raised that the market demand for sustainable palm oil is not as high as expected. WWF undertook an analysis in 2009 of RSPO members' buying patterns of certified palm oil, which indicated many were not yet procuring certified sustainable palm oil. Without a market demand, producers are unlikely to undertake certification. RSPO figures for 2010 show that the situation has improved, showing that 56% of available certified palm oil was purchased in 2010, up from 25% in 2009 (Figure 1.1), though the total to date is 46%. Figures are lower for palm kernel oil, with only 27% of the available total purchased to date<sup>2</sup>.

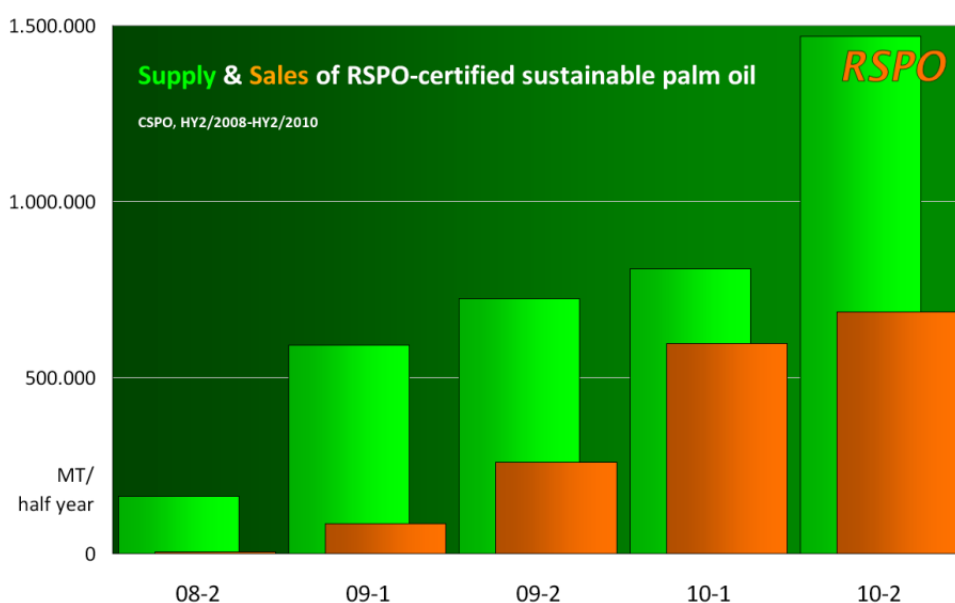


Figure 1.1: Supply and sales of RSPO certified palm oil from March 2008 – December 2010 (Source: RSPO)<sup>3</sup>

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Despite progress, businesses continue to face challenges in the transition to sourcing sustainable palm oil in products, including aspects such as the complexity and lack of transparency in the supply chain. UK businesses have been largely working individually on understanding and influencing their supply chains of palm oil, including making a commitment about sourcing sustainable palm oil.

## 1.2 Project scope

This project sets out to help address this challenge through the systematic collection and analysis of data and information about UK palm oil supply chains. This report is one of two reports of the project; the other report uses the information identified to present a review of potential policy options for the UK Government to consider.

This research aims to identify as far as possible the structure of supply chains (including those specific to government procurement), information on businesses operating at each stage, estimated quantities of palm oil (including future trends) and where possible, its derivatives, traded at each stage. Company commitments to sourcing sustainable palm oil are also examined, particularly in terms of the implications for the sustainability of the UK palm oil supply. This includes identifying how far companies have progressed with the commitments and steps they have taken to date, in terms of the overall consumption of sustainable palm oil in the UK.

The report details the import of palm oil products, the use of palm oil products in all significant sectors, including food, cleaning products, animal feed, personal care and cosmetics, and its use as a renewable fuel for transport and heat and power generation (including palm oil, palm oil derivatives, or palm oil already contained in a product); and the consumption of palm oil products in the retail sector, the service industry sector, as well as information about public procurement.

It is important to note that 'sustainable' palm oil is not limited to the RSPO, however currently it is the main tool available in the industry. As such, the RSPO has been used as a proxy for sustainable palm for the purposes of this work, on the basis that it seeks to address social and environmental impacts of oil palm cultivation. No analysis of the RSPO or other certification schemes or initiatives has been undertaken as part of this project. Other options for sustainable palm oil include:

- Sustainable Agriculture Network – working with several oil palm plantations in South America and Indonesia.
- ISCC – working with a number of oil palm plantations in SE Asia. Currently only available for biofuel and bioenergy uses.
- Government programmes – Indonesia is currently in the process of implementing the ISPO (Indonesian Sustainable Palm Oil) certification scheme.
- Other company and investor-led initiatives

## 1.3 Palm products

Palm oil comes from the fruit of the oil palm tree (*Elais guineensis*), which is grown in plantations in Asia, Africa and South America.

Fresh Fruit Bunches (FFB) are crushed to extract crude palm oil (CPO) from the fruit mesocarp (the fleshy part of the fruit) and the palm kernels are extracted from the palm nuts and crushed to extract

palm kernel oil (PKO) (Figure 1.2). Additionally, the palm kernel expeller or meal (PKE or PKM) is also produced from the crushing process. The oil is then refined, bleached and deodorised (RBD) for most uses. A product of the refining process is Palm Fatty Acid Distillate (PFAD).



Figure 1.2: Palm fruit, with FFB in background (Image Source: Proforest)

It is estimated that more than 60% of the palm oil used globally has gone through additional processing, known as splitting or fractionating, to create palm oil derivatives<sup>3</sup>. At the first stage, the oil is split into liquid palm olein (80%) and solid palm stearin (20%). This can be further fractionated, hydrogenated and blended with other oils (Figure 1.3).

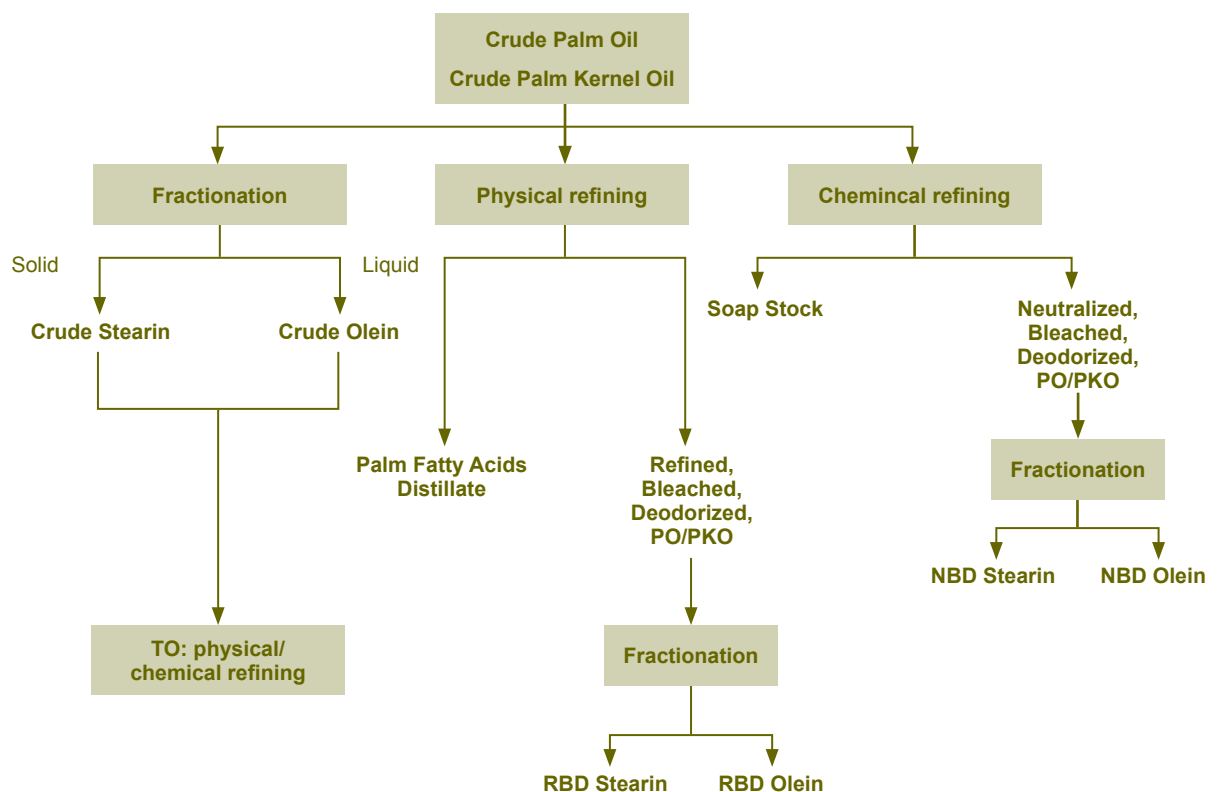


Figure 1.3: Palm oil fractionation process (Source: <http://www.americanpalmoil.com/story.html>)

The oleochemical industry chemically modifies palm oil and palm oil fractions using hydrolysis (fat splitting of the triglycerides) to produce fatty acids and glycerine, and transesterification to produce fatty acid methyl esters (FAME) (Figure 1.4). PKO is a particularly import feedstock for products resulting from hydrolysis, along with coconut oil, which are together referred to as lauric oils (used widely in the personal care sector). Transeserification of CPO is used to make biodiesel (known as PME or Palm Methyl Ester, see Section 8.2).

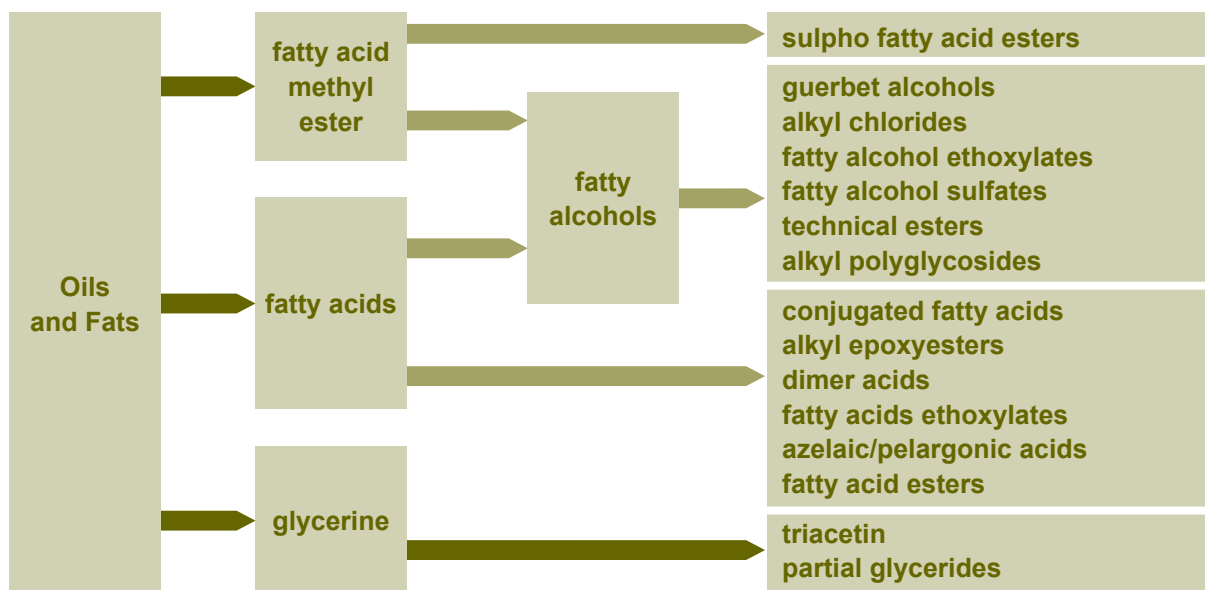


Figure 1.4: Oleochemical derivatives (Source:Cognis)

The term 'palm oil products' is used in this report to refer to products which may contain palm oil, palm kernel oil and their fractions and derivatives, and does not exclusively refer to finished products such as cooking oil. The scope of the 'palm oil products' covered in this work includes palm oil and its direct fractions, palm kernel oil and palm kernel meal, together with as much information relating to derivatives as possible. It is important to note that derivatives are *not* the primary focus of this project, and much more research is needed (particularly by the companies themselves) on the supply chain and the volumes used.

## 2. Methods and approach

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**This research brings together data and information from the range of UK and international businesses involved in the UK supply chain, as well as NGOs and other relevant sources. The project included over 50 interviews and meetings, a stakeholder workshop, as well as attendance at the RSPO 8<sup>th</sup> Roundtable meeting (RT8) and discussions with stakeholders there.**

### 2.1 Approaches to data collection

The research methodology included three main approaches to data and information collection:

- Collecting stakeholder views (including key informant interviews, meetings, presentations, workshops and an online questionnaire), including European and producer-country participants
- Systematic interviews and questionnaires administered to a sample of companies involved in the UK palm oil supply chain, including European and SE Asian companies
- Desk-based collection/review of publicly available data and information

An initial list of stakeholders for the project was drawn up, based on:

- Proforest expert knowledge of the palm oil sector,
- Discussions with key actors and initiatives;
- Discussions with UK Government.

Additional stakeholders were added to the list over the course of the project, and provided with periodic updates.

Data on the UK palm oil supply chains was sought through a systematic interview and questionnaire-based approach with a range of supply chain actors. Information was collected from all stages of the supply chain.

A series of meetings were held with key stakeholders over the course of the project, including in person (for UK-based organisations) and by telephone (for organisations located abroad). The meetings with stakeholders included discussions on:

- Data related to the sector (number of players involved, volumes, key issues)
- Known company commitments

A workshop for wider government and business stakeholders was held in the UK to present the draft project results, including analysis of data collected from companies in the supply chain.

The workshop was used as an opportunity to seek input from stakeholders on the draft palm oil map. The workshop was held in London in November 2010.

The draft findings were disseminated at the RSPO Roundtable meeting (RT8) on 8-11 November 2010 through a poster presentation and discussion. As with the UK stakeholder workshop, participants were encouraged to provide feedback on draft results.

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In addition to stakeholder engagement and supply chain questionnaires, desk-based review of available data and statistics for palm oil included:

- Trade data
- Publicly available reports, produced by industry associations, NGOs and other research organisations, journals and other gray literature
- Internet resources and popular media

Note that all quantities of palm products are reported in mt (metric tons), equivalent to 1,000 kg.

Because the work began part-way through 2010, the most recent complete-year trade data available was for 2009. However, import and consumption are expected to be relatively stable, and it is likely that the 2009 numbers are similar to 2010.

GreenPalm operates on a calendar year basis, and certificates can be redeemed up until the end of the following March, therefore 2009 was the most recent year where complete data was available. Where 2010 purchases were higher than 2009, these were used instead of 2009 figures when calculating the current proportion of sustainable palm oil. Many of the companies with commitments to sustainability had already covered their volume with GreenPalm in 2009, so the figures provided would not be a significant underestimate for compared with 2010 purchases.

The RSPO certified quantities were based on up to date figures in late 2010.

## **2.2 Disclaimer**

The information provided in this report in many cases is not officially documented, and numbers have been estimated using the best available information, collated from interviews and other sources.

It is designed to give a best estimate of flows and quantities. In order to do this, calculations based on assumptions about market shares and product ranges have been undertaken. The numbers provided in this report are not meant to be exact and should be taken as a guide. Where relevant, the methodology for deriving the estimate has been noted, stating assumptions. Where figures are based on values stated in interviews, these have been indicated.

There remain uncertainties in the data presented.



## 3. Import of palm oil

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### 3.1 Key Findings

In 2009, the UK imported<sup>5</sup>:

- 595,300 mt palm oil (including direct fractions, olein and stearin and palm fatty acid distillate)
- 48,100 mt palm kernel oil
- 663,300 mt palm kernel meal

The UK has imported 40,000 mt of certified sustainable palm oil from producing countries, as well as around 15,000 mt of certified sustainable palm oil from other European sources. Furthermore, it is estimated that UK companies have purchased around 100,000 mt of GreenPalm certificates<sup>ii</sup>. Together this accounts for around 155,000 mt of RSPO palm oil, which is around 24% of current UK imports.

A number of companies operating in the UK have made commitments to source sustainable palm oil, and research undertaken as part of this project suggests they have made good progress; those who shared data had collectively reached about 80% of their targets. If the 2015 target is met by these companies, it is expected that around 244,000 mt of the UK import of palm oil would be sustainable, which is equivalent to 37% of the total import, and over 40% of the estimated volumes used in the food sector.

The European refining sector is well positioned to deliver RSPO certified material to the UK market, as all four key refineries in Rotterdam<sup>iii</sup> have integrated supply chains linked to plantations currently producing almost 1.5 million mt/year of RSPO certified palm oil. The UK sector is less integrated, with only one refinery with an integrated supply chain back to certified plantations (which could be processing up to 170,000 mt/year RSPO certified palm oil within the next year). The current integrated supply chains could theoretically deliver 36% of the UK's current palm oil imports as RSPO certified within a short timeframe<sup>iv</sup>.

No RSPO certified palm kernel meal (including GreenPalm PKE credits) had been purchased at the point this report was written<sup>6</sup>.

The UK also imports palm oil and palm kernel oil derivatives, however because oleochemicals are rarely differentiated based on the original feedstock, imports figures are not available for quantities of palm contained in oleochemical imports. Imports of finished products are detailed in Section 4, and are not included in these figures.

### 3.2 UK importers

The UK's customs agency (HMRC Customs) recorded 33 organisations and individuals that imported palm oil into the UK to date in 2010 (see Annex A), including refineries (3), distributors (3), food and personal care ingredients manufacturers (5), food, personal care and cosmetics manufacturers (4), food wholesale and cash & carry (7), restaurants (1) and individuals (6) and a further four companies engaged in unknown activities. Of these companies, only 15 imported palm oil more than once between January – September 2010. The repeat importers were the refineries and manufacturers, whereas the food wholesale, cash & carry, individuals and unknown did not import more than once during the period (likely due to lower volumes of oil needed).

<sup>ii</sup> These are 2009 figures. The GreenPalm accounting year 2010 does not close until March 2011, and therefore 2010 numbers will not be available until after then.

<sup>iii</sup> There are five edible oil refineries in Rotterdam, one of which is a tolling plant meaning the company does not procure oils directly, only processes oils under contract.

<sup>iv</sup> Equivalent to 231,100 mt: 58,800 mt palm oil and 2,300 mt palm kernel oil from the Netherlands, 170,000 mt from New Britain Oils in the UK

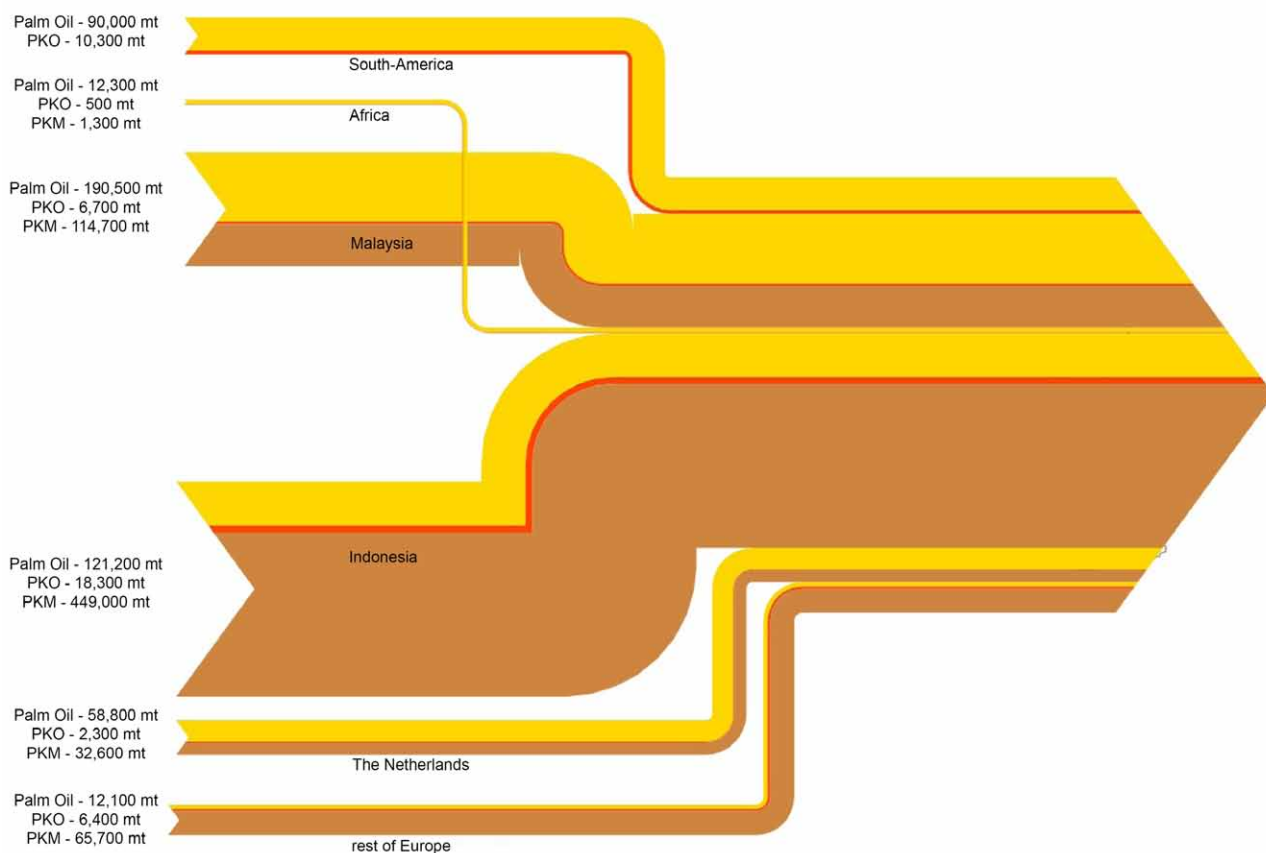


Figure 3.1: UK imports (Yellow – Palm Oil, Red – PKO, Brown – PKM) (2009)

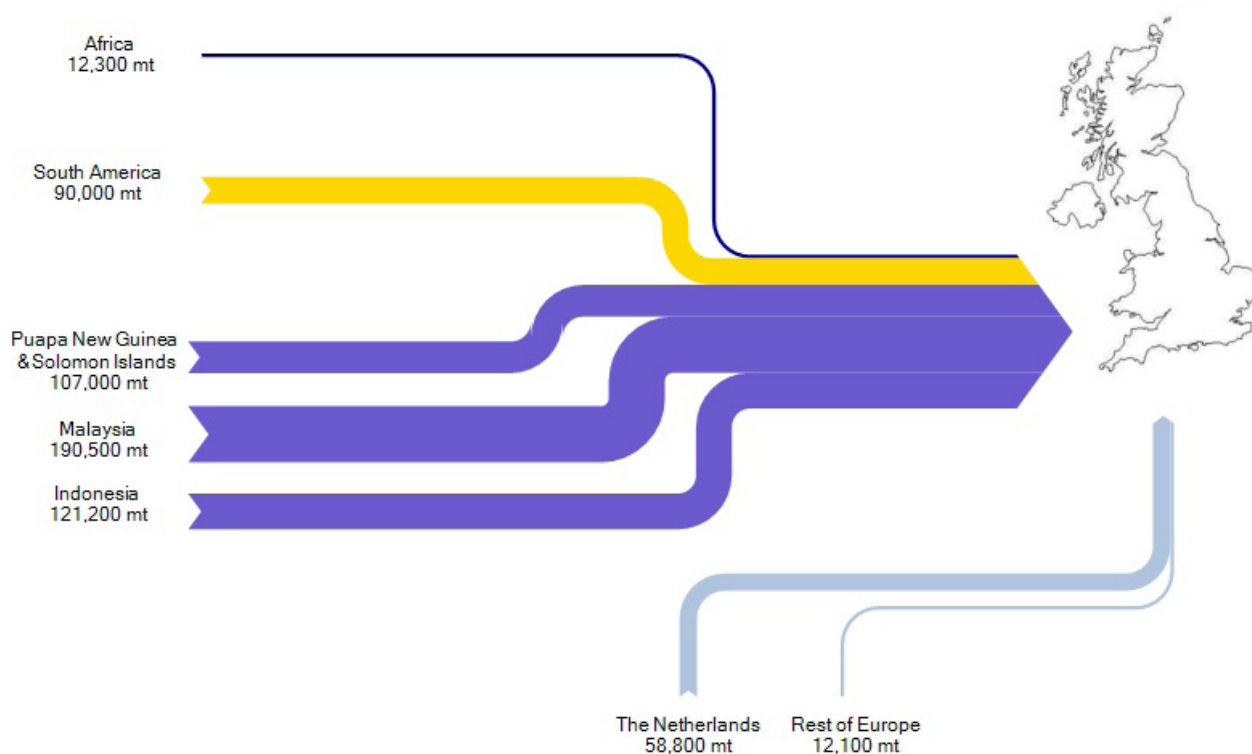


Figure 3.2: UK imports of palm oil (2009)

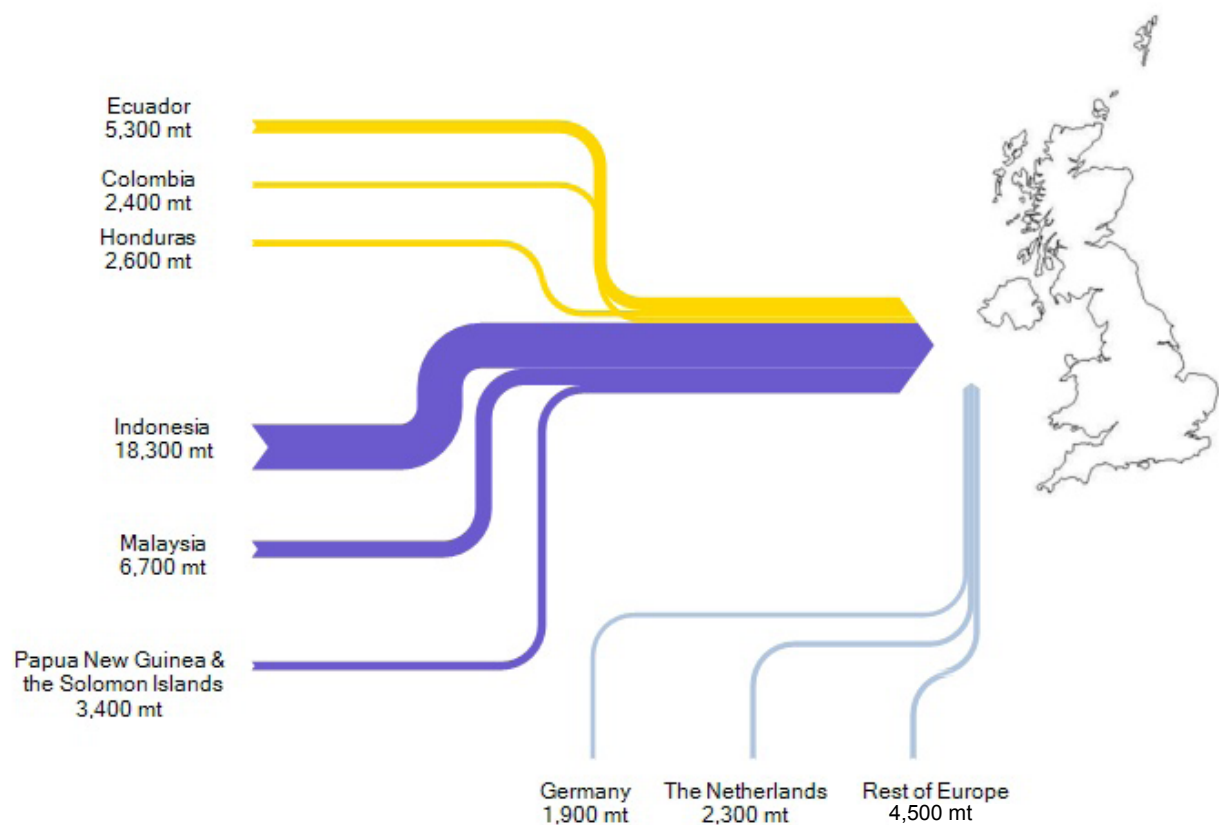


Figure 3.3: UK imports of palm kernel oil (2009)

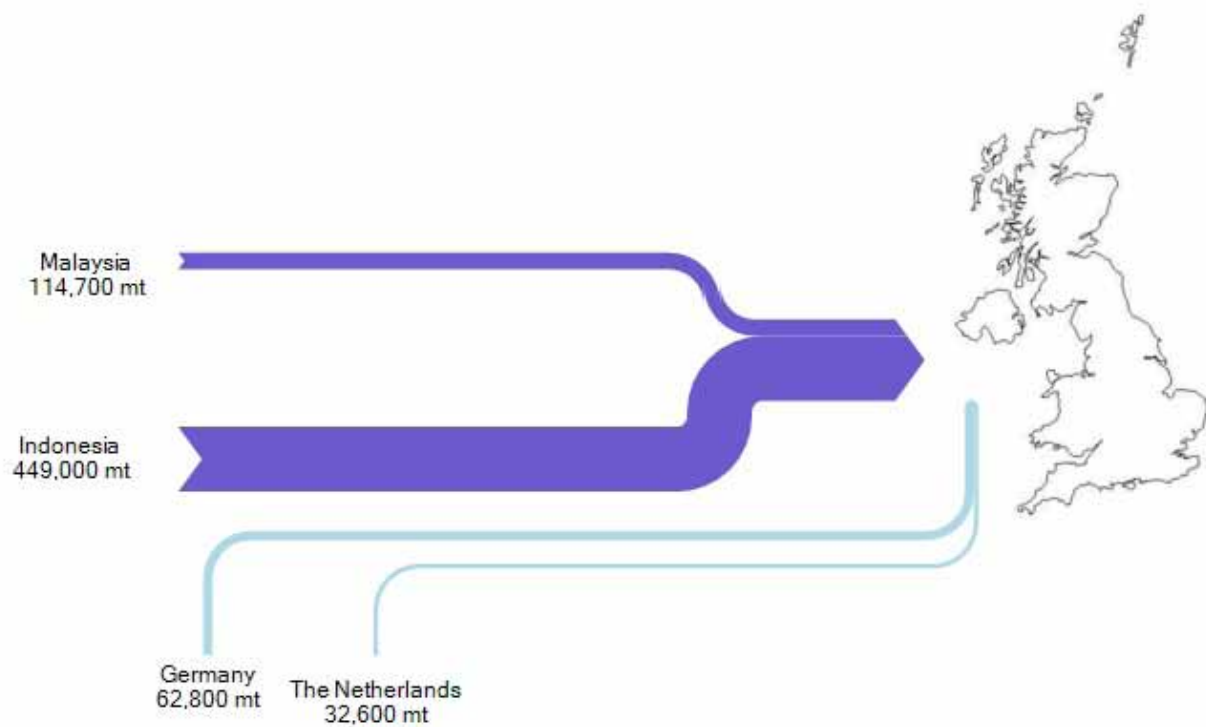


Figure 3.4: UK imports of palm kernel meal (2009)

### 3.3 Trends

The import of palm oil into Europe more than doubled in the last ten years, peaking at 5.4 million mt in 2008, and has showed signs of stabilisation since then (Figure 3.5). Reports suggest that demand for palm oil will continue to remain stable in the coming years. However, CPO output will likely rise sharply in 2011, as output and stocks increase due to the maturing of oil palm plantations following a major plantation expansion a few years ago; this likely to drive prices down, particularly compared to other vegetable oil alternatives such as soybean oil and may influence import volumes.

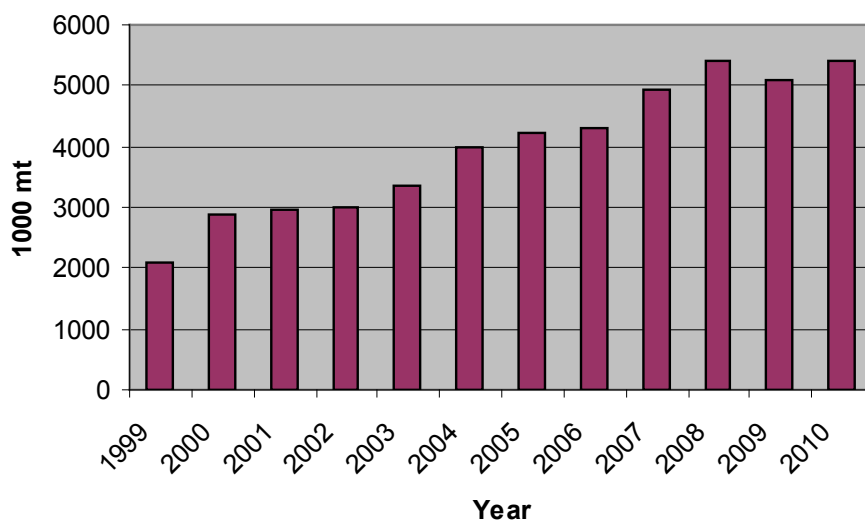


Figure 3.5: EU-27 Palm Oil Imports by Year (source: USDA)

It is likely that almost all of the RSPO certified palm oil being sold is destined for the European market (with limited quantities going to North America, Australia and New Zealand).

In 2009, 98,044 mt was sold as certified sustainable, with a further 245,813 mt as GreenPalm<sup>9</sup>. This total is equivalent to almost 8% of the total palm oil import into Europe during the same time period. In 2010, this figure rose to 1,281,134 mt (438,515 mt RSPO certified, and 842,619 mt GreenPalm), which is equivalent to 23% of the imports of palm oil into Europe in 2010<sup>10</sup>.

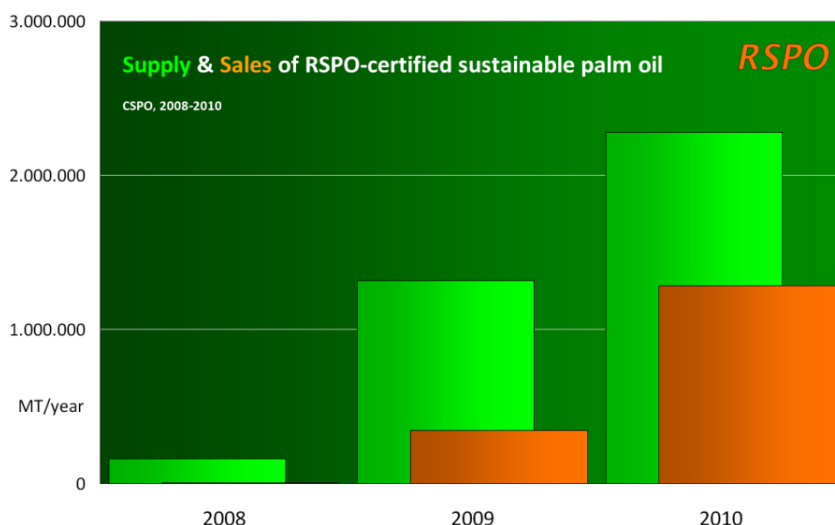


Figure 3.6: Annual supply and sales of RSPO certified palm oil (Source: RSPO)

The trend in the UK over the past five year differs from the EU in that quantities palm oil, palm kernel oil and palm kernel meal have declined, with 2009 imports around 60% of what they were in 2005 . However, similarly to the European figures, it is expected that these will remain stable in the coming years . Information provided by companies interviewed for this research suggests that they are actively seeking alternatives to palm, and steps have already been taken (for example, in crisp frying) since 2005 to use palm alternatives. However, this trend may be influenced by fluctuating commodity prices.

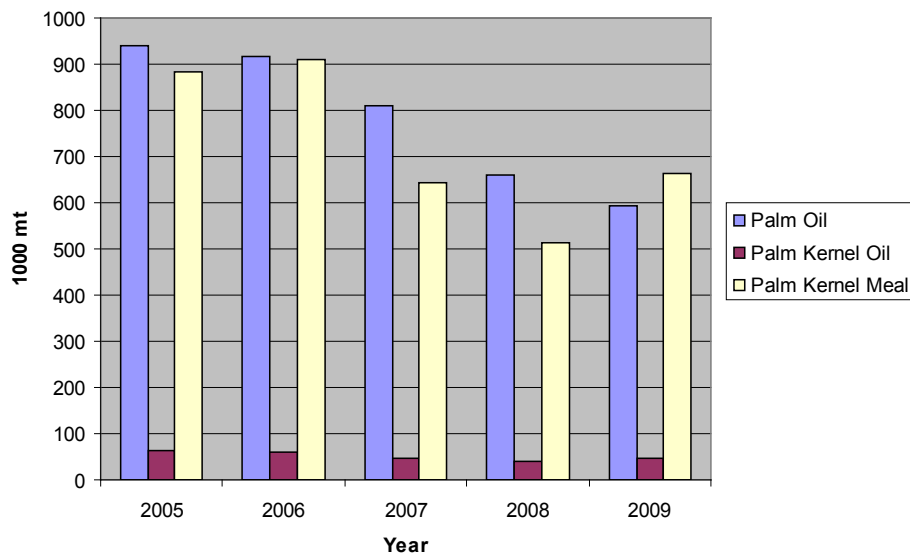


Figure 3.7: Trends in UK import of palm (Source: Oil World 2010)

The origin of imports of palm oil into the UK over the past 15 years has consistently been Indonesia, Malaysia, Papua New Guinea and The Netherlands. Colombia has increasingly been a source of imports over the past decade (Figure 3.8). In 2008 and 2009, Honduras became a significant exporter to the UK, making up 6.5% of the UK's total import in 2009<sup>13</sup>, surpassing Colombia (5% in 2009). Import of palm oil from Ecuador in 2009 dropped to almost 3% of the total UK import, down from almost 7% in 2008. While Brazil currently supplies only 6,000 mt of palm oil into the UK, it is set to significantly increase its planted area<sup>14</sup> , which could increase the volumes exported to the UK.

Sub-Saharan Africa (Cameroon, Ghana and the Ivory Coast) has consistently made up less than 1% of the UK's total import over the past 5 years<sup>15</sup>, but with increasing investment and plantation area in West Africa<sup>16</sup>, this may change.

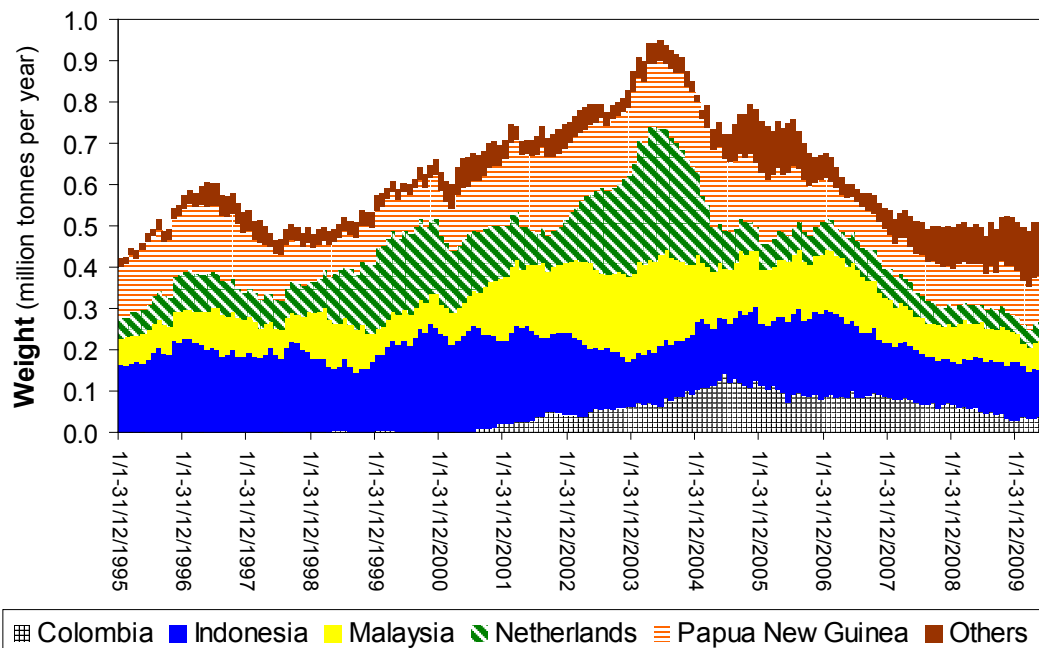


Figure 3.8: The UK's imports of palm oil 1995 -2009 (Eurostat 2010)

### 3.4 UK imports from Europe

Approximately 12% of palm oil that entered the UK in 2009 was imported from European countries, equivalent to around 70,900 mt. Almost 10% of palm was imported from the Netherlands (58,800 mt), with the remaining 2% from Germany, Denmark, Spain, France and Ireland (12,100 mt)<sup>17</sup> (see Figure 3.2).

For palm kernel oil (PKO), around 18%, equivalent to 8,700 mt, was imported from European countries in 2009, mainly split between the Czech Republic (9%) Denmark (16%), Germany (22%), Ireland (24%) and the Netherlands (26%) (see Figure 3.3). This past year differs from the previous four, where around 50% of the European imports were from the Netherlands, as compared to 26% in 2009.

The quantity of palm kernel meal imported into the UK from European countries was almost 15% in 2009 (98,300 mt), significantly up from the previous 4 years (which ranged from 2.3% to 5.4% of total UK palm kernel meal imports). This was dominated by Germany (almost 10%) and The Netherlands (almost 5%) (see Figure 3.4 - note diagram does not include approximately 3,000 mt from the rest of Europe).

### 3.5 Sustainability in the European refining sector

The industrial refining capacity for the palm oil entering in the United Kingdom from Europe is predominately located in the Netherlands, focussed at the Port of Rotterdam.

The total vegetable oil refining capacity in Rotterdam is approximately 3.49 million mt<sup>7</sup>. The 2009 throughput of vegetable oils in the Port of Rotterdam was 8 million mt<sup>8</sup>, which includes transshipments and storage. Of the total annual throughput volume of edible oils, fats and oleochemicals in Rotterdam in 2009, 42% was palm oil, 8% was palm stearin, 8% was palm kernel oil and 2% was palm olein. The remaining 39% was coconut oil, sunflower oil, yubase, soybean oil and more than 100 other products (see Figure 3.9).



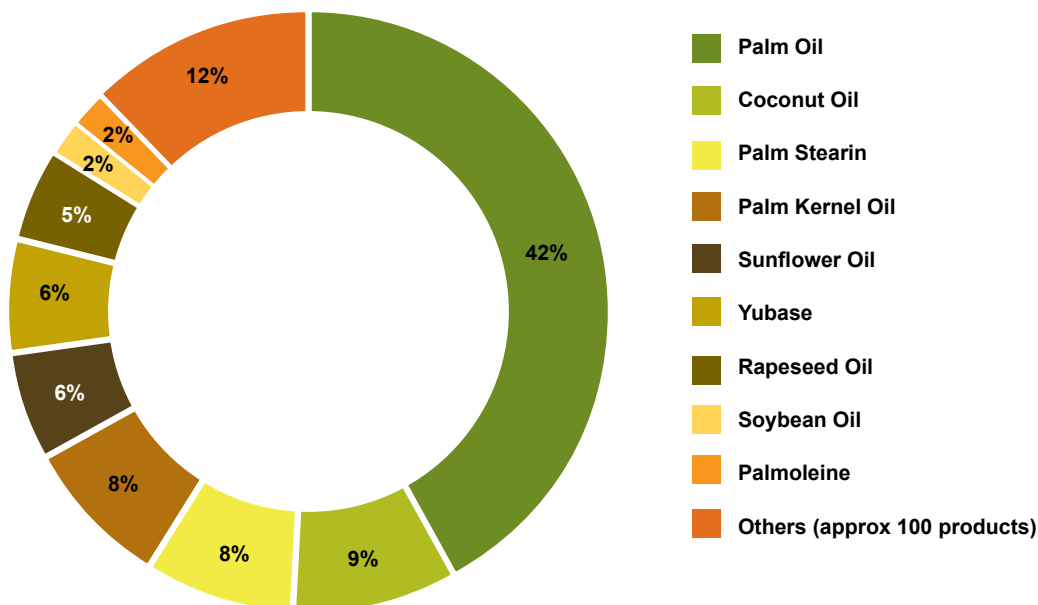


Figure 3.9: Throughput of edible oils, fats and oleochemicals (Source: Port of Rotterdam 2010)

There are five edible oil refineries processing palm oil at the Port of Rotterdam, including Cargill, IOI Lodders Croklaan, MaasRefinery, Sime Darby Unimills and Wilmar.

- Cargill has a 1,000,000 mt/year refinery in Rotterdam – Botlek<sup>20</sup>. In 2006, they increased their Rotterdam refining capacity for tropical oils including increasing capacity for coconut and palm kernel oil refining by 200,000 mt/yr, and palm oil by 300,000 mt/yr<sup>21</sup>.
- IOI Lodders Croklaan has a 1,200,000 mt/year palm oil refinery in Rotterdam - Maasvlakte<sup>22,23</sup> and a speciality fats & oils factory Wormerveer<sup>24</sup>, processing 250,000 mt/year<sup>25</sup>.
- MaasRefinery has a 40,000 mt/year speciality oils refinery in Rotterdam – Botlek<sup>26</sup>. They are a tolling plant<sup>27</sup>, which means that they process fats and oils under contract, rather than purchasing and marketing products themselves.
- Sime Darby Unimills has a 500,000 mt/year refinery in Zwijndrecht, near Rotterdam<sup>28</sup>, which can process palm oil, coconut, soya bean, rapeseed and sunflower oil<sup>29</sup>. They supply the Unilever margarine factory in Rotterdam - Nassaukade<sup>30</sup>.
- Wilmar Edible Oils has a 750,000 mt/year refinery in Rotterdam – Pernis<sup>31</sup>.

The edible oil refineries in Rotterdam are part of integrated supply chains that include oil palm plantations engaged in RSPO certification. The plantations linked to the Rotterdam refineries currently produce over 1,454,796 mt of palm oil/year of RSPO certified palm oil (equivalent to around 27% of the 2010 EU import of palm oil)<sup>v</sup>. It is important to note that the Rotterdam refineries source vegetable oils from a range of suppliers including (but not limited to) plantations within their integrated supply chains. Out of the 58,800 mt of palm oil and 2,300 mt of palm kernel oil imported by the UK from the Netherlands in 2009, an estimated 15,000 mt was certified RSPO palm oil (equivalent to around 26% of UK imports of Dutch palm oil).

<sup>v</sup> According to USDA figures, the EU-27 import of palm oil in 2010 was 5.4 million mt

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Cargill's Rotterdam refinery is RSPO chain of custody certified (mass balance)<sup>32</sup>. A portion of their palm oil is sourced from their own plantations. PT Hindoli in Sumatra encompasses Cargill's own plantations (RSPO certified in 2009) and a smallholder scheme consisting of 8,800 smallholders and 17 cooperatives (RSPO certified in August 2010), together producing 186,892 mt/year palm oil and 42,097 mt/year palm kernels<sup>33</sup>. They also have two other plantations, PT Harapan in Borneo and PT Indo Sawit Kekal, both which are working towards certification<sup>34</sup>. They have set a goal of buying 60% of total global crude palm oil from RSPO members by the end of 2010<sup>35</sup>. Additionally, they have received ISCC certification for their Rotterdam refinery and PT Hindoli<sup>36</sup>.

The IOI Group's two European production sites (Rotterdam and Wormerveer) are RSPO supply chain certified (mass balance and segregated)<sup>37</sup>. The Rotterdam site includes a 300,000 mt/year facility opened in June 2010, which can supply 100,000 mt/year RSPO segregated palm oil (about 10% of the volume) and produces margarine hardstocks<sup>38 39</sup>. IOI has 12 mills, 82 Estates in Malaysia and around 153,000 Ha of palm oil plantations<sup>40</sup>, and five of these have RSPO certification producing 319,539 mt/palm oil and 74,153 mt/year palm kernels<sup>41</sup>. They plan to have all units certified by the end of 2011<sup>42</sup>. They also commissioned an audit by Meó (the consulting company currently responsible for managing the International Sustainability and Carbon Certification ISCC) which found average GHG savings versus fossil fuel of 53%<sup>43</sup>. IOI Group have a further 65,000 Ha in Indonesia of which 5,000 Ha is planted and a 33% investment in a 60,000 Ha area including 4 mills<sup>44</sup>. IOI is represented on the RSPO Executive Board<sup>45</sup>.

Sime Darby Unimills<sup>vi</sup> is RSPO chain of custody certified (mass balance and segregated)<sup>46</sup>. They are the European subsidiary of Malaysia based multinational Sime Darby Group. Unimills sources certified RSPO palm oil from 5 Sime Darby mills in Sabah, Malaysia, of which 4 are RSPO certified, and produce 522,394 mt/year of palm oil and 8,914 mt/year palm kernels<sup>36</sup>. In Indonesia they have one RSPO certified palm plantation producing 33,609 mt/year of palm oil and 8,914 mt/year palm kernels<sup>48</sup>. Currently, they have 16 operating units certified and are seeking RSPO certification for all of their 63 operating units and 208 estates by the end of 2011<sup>49</sup>. Sime Darby is represented on the RSPO Executive Board<sup>50</sup>.

Wilmar's Rotterdam refinery is RSPO chain of custody certified (mass balance and segregated)<sup>51</sup>. As of 1 October 2010, 7 out of their 8 mills in Malaysia were certified, equivalent to 71,000 Ha and 283,458 mt/year of certified RSPO palm oil and 62,711 mt/year palm kernels<sup>52</sup>. A further 2 Indonesian mills are certified, equivalent to 21,000 Ha and 108,904 mt/year of certified RSPO palm oil and 22,902 mt/year palm kernels<sup>53</sup>. RSPO certification currently covers 40% of their planted area<sup>54</sup>. Wilmar is represented on the RSPO Executive Board<sup>55</sup>.

### 3.6 UK imports from producing countries

Approximately 88% of palm oil that entered the UK in 2009 was imported from producing countries, equivalent to around 520,000 mt. Of that, just over 80% was from Southeast Asia, including Indonesia (121,200 mt), Malaysia (190,500 mt) and Papua New Guinea (106,000 mt)<sup>56</sup>. A further 18% (90,000 mt) was from South America and 2% (12,300 mt) was from Africa<sup>57</sup> (see Figure 3.2).

For palm kernel oil (PKO), around 82%, equivalent to 39,500 mt, was imported from producing countries in 2009<sup>58</sup>. Of this, 42% was from Indonesia (18,300 mt) almost 17% from Malaysia (6,700 mt), and 13% from Ecuador (5,300 mt) with the remaining volumes from Papua New Guinea, Honduras, Colombia and the Ivory Coast<sup>59</sup> (see Figure 3.3).

<sup>iv</sup> Unimills formally changed its name to Sime Darby Unimills in October 2010

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The quantity of palm kernel meal (PKM) imported into the UK from producing countries was almost 85% in 2009, 80% which was from Indonesia (449,000 mt) and 20% from Malaysia (114,700mt)<sup>49</sup>. (see Figure 3.4).

These figures do not include finished products that contain palm oil, nor do they include oleochemical derivatives.

### 3.7 Sustainability in the UK refining sector

The UK has four vegetable oil refineries processing palm, including AAK (Hull), ADM PURA in Purafleet (Thames), NBOils (Liverpool) and Britannia Food Ingredients (Goole). They have a total refining capacity of more than 940,000 mt of vegetable oil per year. Together they handle around 500,000 mt<sup>50</sup> of RBD palm oil, palm stearin, palm olein and palm kernel stearin.

- ADM purafleet has a 300,000 mt/year edible oil refinery, which processes palm, sunflower, olive, rapeseed, and coconut oils<sup>62</sup>. The refinery is located adjacent to the world's largest margarine factory, operated by Unilever. ADM supplies approximately 45% of the UK's bulk oils requirements<sup>63</sup>.
- AAK UK has a 400,000 mt/year capacity edible oil refinery in Hull, which processes vegetable oils including palm, rapeseed and sunflower oil<sup>64</sup>. Around 20% of this is exported<sup>65</sup>. They have additional processing facilities in Oldham and Runcorn<sup>66</sup>.
- New Britain Oils has a dedicated palm oil refinery that was commissioned in May 2010 and has a capacity of 150,000 – 170,000 mt/year<sup>67</sup>.
- Britannia Food Ingredients facilities in Goole, East Riding Yorkshire include melting plants, blending and refining facilities with a total capacity of 70,000 mt/year<sup>68</sup>. They process cocoa, palm oil and palm fractions as well as speciality fat ingredients including sal, illipé, shea, kokum, mango and their fractions<sup>69</sup>.

To date, there have been approximately 40,000 mt of certified sustainable RSPO palm oil imported by UK refineries<sup>70</sup>. A very small proportion of this is exported to other European countries<sup>71</sup>. This does not include import of refined oils and fats by customers directly from European refineries, nor does it include GreenPalm purchases. The volume of RSPO certified palm oil physically imported into the UK is equivalent to around 6% of the total import of palm oil and palm kernel oil.

Compared with the Dutch refining sector, the UK refineries have much less supply chain integration, with only one of the four refineries having direct access and integration with RSPO certified plantations.

AAK owns and operates the RSPO GreenPalm certificate trading platform, and were the first organization to import certified RSPO CPO in the world, in November 2008<sup>72</sup>. They have RSPO chain of custody certification for their Hull refinery (segregated and mass balance)<sup>73</sup>, and suggest to their customers that RSPO certified is appropriate for bulk customers, and that GreenPalm is more appropriate for smaller volumes. They sell two RSPO certified product lines: Akopalma SG (palm oil) and Akofluid Pumpable Shortening<sup>74</sup>. While AAK does not own plantations, one of their shareholders is also a shareholder of United Plantations<sup>75</sup>. AAK is represented on the RSPO Executive Board<sup>76</sup>.

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ADM has RSPO chain of custody for its Purfleet refinery<sup>77</sup>. ADM has stated they are undertaking an analysis of their palm supply chain to determine how they can meet our customers' desire for sustainably sourced products.<sup>67</sup> ADMC (ADM's parent company) has a controlling interest in Wilmar of 6.7%<sup>79</sup>, but are not directly part of Wilmar's integrated supply chain.

NBOils has RSPO chain of custody certification (segregated) for its Liverpool refinery<sup>80</sup>. It sources all of its palm oil from the New Britain Palm Oil plantations in Papua New Guinea and the Solomon Islands. NBPOL currently has over 48,900 hectares of RSPO certified planted palm oil plantations and long term leases over 30,000 hectares of additional land, some of which will be converted to palm oil, and six oil mills<sup>81</sup>. The RSPO certified estates produce 277,524 mt/year of palm oil and 60,503 mt/year palm kernels<sup>82</sup>, and all of their estates together have a total capacity to produce 520,000 mt of palm oil products<sup>83</sup>, which is equivalent to over 80% of the UK's current import of palm oil. However, access to this supply is limited by their UK refining capacity and competition with other markets. New Britain Palm Oil is represented on the RSPO Executive Board<sup>84</sup>.

Britannia Food Ingredients is a member of the RSPO<sup>85</sup>. While they do not have RSPO chain of custody for their Goole refinery, they rely on RSPO members for supply of their palm requirements<sup>86</sup>. They have recently been acquired by Olam, who are in the process of developing oil palm plantations in Gabon and have stated their intention to seek RSPO certification for these<sup>87</sup>.

## 4. Import of finished products

### 4.1 Key Findings

A significant proportion of finished products that contain palm oil are imported into the UK every year, estimated to be somewhere in the order of 190,000 - 350,000 mt, adding 30 – 50% on to the total use of palm oil in the UK.

Estimating the quantity of palm oil imported as an ingredient in finished products is challenging for several reasons: trade data is often presented in aggregated categories which include products with different ingredients, products expected to contain palm may also contain other vegetable oils, and calculating estimated content requires assumptions about the average palm oil content of a product. All of these introduce significant uncertainties.

The estimation approach included selecting product categories that were likely to contain palm oil, and drawing on UK trade data to calculate the net import of each selected product category. An estimate of likely palm oil content was then applied (see Table 4.1). This approach suggested that more than 350,000 mt of palm oil could be imported as an ingredient in finished products. This does not include palm products used in the production of food, for example palm kernel meal and palm oil used in animal feed, or frying fats used in the preparation of imported food products. It also does not include the oleochemical derivatives.

However, information provided by retailers indicates that they source upwards of 70% of products from UK manufacturers. Assuming that this proportion applies for the retail sector as well as the service sector (which together are likely to account for over 70% of the palm oil consumption, as set out in Section 12), it is estimated that an additional 190,000 mt of palm oil would be imported as an ingredient in finished products. This estimate is lower than the numbers generated by applying palm content estimates to the trade data, which highlights the weakness in these figures.

Product	Net imports	Estimated PO content	Estimated PO volume
Margarine	18,700 mt <sup>88,89</sup>	24%	4,488 mt
Bakery			150,000 m <sup>90</sup>
Chocolate	226,328 mt <sup>91</sup>	5.15%	11,655 mt
Ice cream	86,044 mt <sup>91</sup>	10%	8,604 mt
Peanut butter	9,000 mt <sup>93</sup>	2% <sup>94</sup>	181 mt
Soap base	40,000 mt <sup>95</sup>	75%	30,000 mt
Soap	200,000 mt <sup>96</sup>	75%	150,000 mt
Total			354,928 mt

Table 4.1: Import of finished products, with estimated palm oil ingredients content

## 5. Map of UK palm use

### 5.1 Key Findings

As highlighted previously, the UK imported a total of 643,400 mt of palm oil in 2009, (including 595,300 mt of palm oil and 48,100 mt of palm kernel oil), which is equivalent to approximately 1.2% of the 44.5 million mt palm oil and 5.4 million mt of palm kernel oil global production. For palm kernel meal, the UK imported 663,300 mt in 2009, approximately 10% of the 6.4 million mt global output of PKM.

Understanding where this imported palm oil, palm kernel oil and palm kernel meal is used in the UK is a critical component of understanding where the leverage points in the supply chain are likely to be, particular when considering policy options. Combined with information about which sectors are currently sourcing or seeking to source sustainable palm components, this picture provides an overview of where efforts are most needed, and most likely to be effective.

The overall map of the UK palm use is presented below in Figure 5.1, with detail provided in subsequent sections.

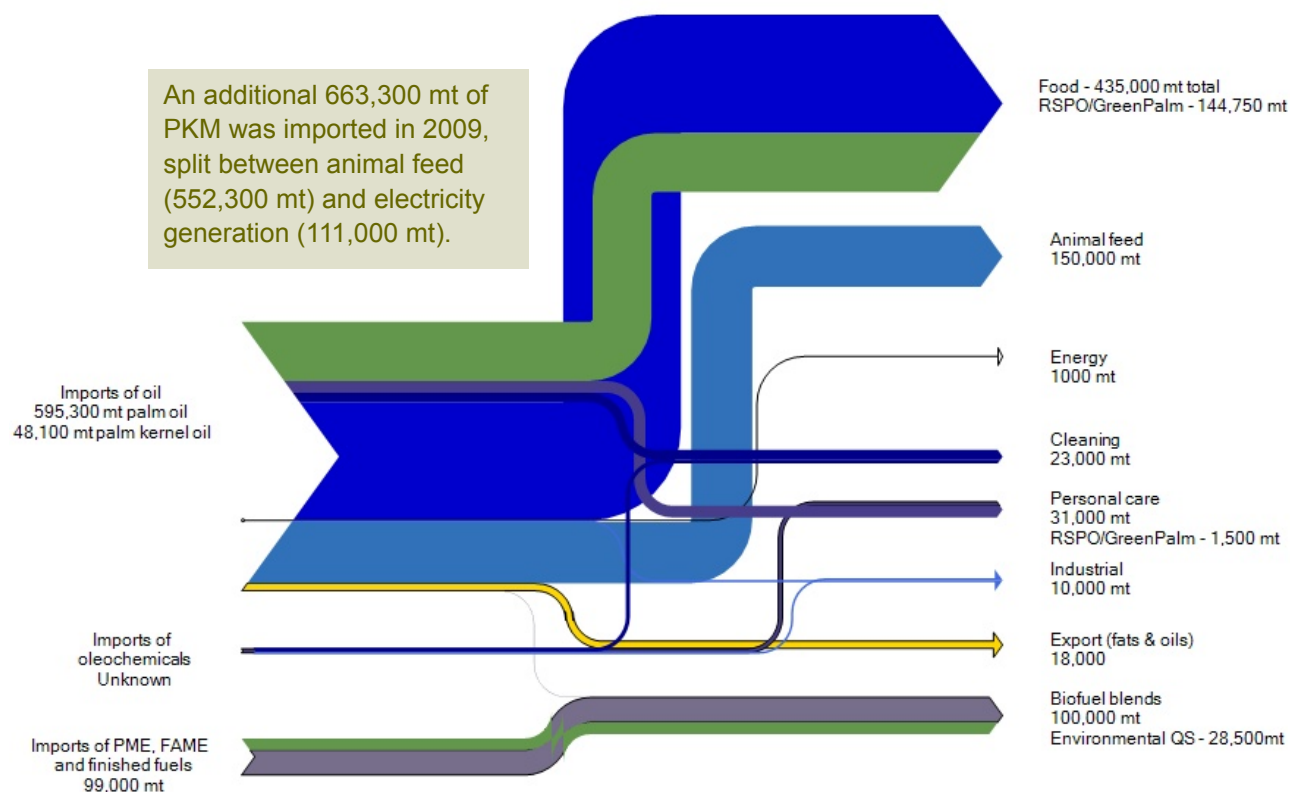


Figure 5.1: Estimated use of palm oil by sector in the UK (2009/10), not including import of finished products or palm kernel meal

**Note:** Actual consumption of palm oil in the UK is higher than the estimates provided above, as it also includes finished products, compound ingredients and oleochemicals, none of which are identified as palm oil at the point of import. While palm-derived oleochemical imports are unknown, 25,600 mt has been allocated in the diagram above, split between cleaning, personal care and industrial.



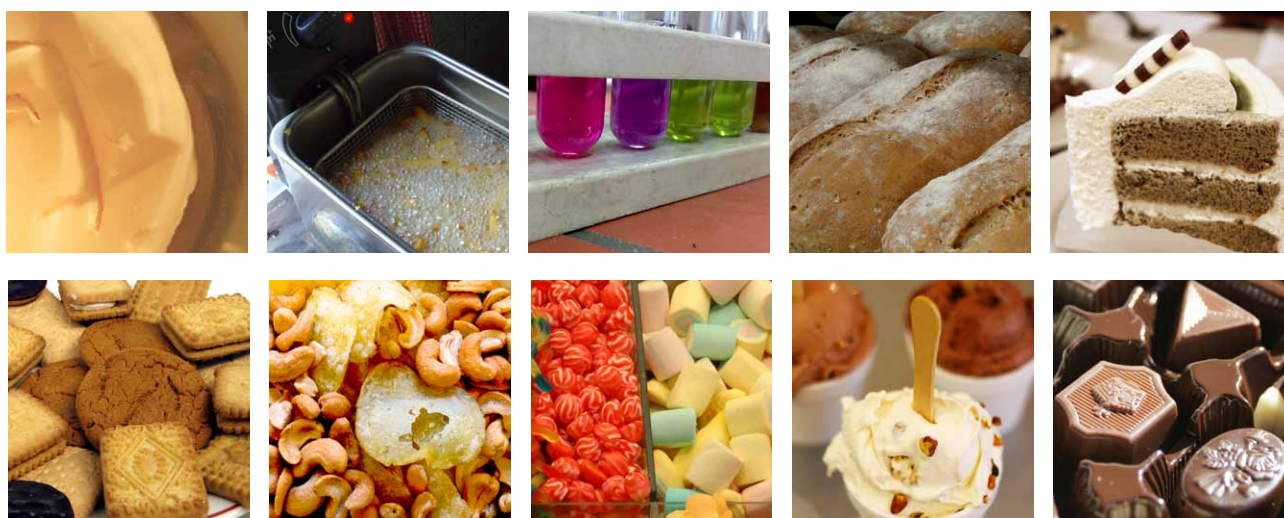
## 6. Use of palm in food

### Key Findings

The food industry is the largest consumer of palm oil globally. Estimates put global use around 80%<sup>98</sup>, though USDA statistics indicate the proportion of palm oil used in the global food industry has declined from more than 86% to around 74% in the past decade (it is important to note however that actual use by volume almost doubled), with industrial uses (such as biofuels) increasingly taking a larger share<sup>99</sup>.

Research for this project including interviews, review of the GreenPalm database, Panorama<sup>vii</sup> figures (in combination with calculations based on company market share), gray literature and popular media was undertaken with the aim of understanding what parts of the UK food industry were using palm oil, as well as a total estimate for the industry. Using this approach, it was possible to account for 390,000 mt of palm oil (including palm oil and palm kernel oil), which is equivalent to 60% of the UK imports of palm oil (641,200 mt). Given that it was not possible to get data about every sub-sector of the UK food industry (particularly bakery, e.g. cakes and pies, where it is known that palm oil is used extensively), it is assumed that this is an underestimate. Therefore, the average between the calculated palm oil use from data collection and calculated 75% of imports is used as the estimate for the UK food sector. This average is equivalent to 435,000 mt palm oil (including palm oil, palm kernel oil and their fractions), which is 68% of the UK's import of palm oil and palm kernel oil. This does not include animal feed, which can also be indirectly attributed to the food sector.

Where estimates were possible for food sub-sectors, this information has been presented in Table 6.1, and details provided in subsequent sections. Note that the total of the categories is less than the total estimate, as there was insufficient information available to categorise all possible food uses. The estimates for RSPO material are in some cases derived from allocations of a company's total sustainable palm purchases against specific food categories, based on the value or estimated palm volume of that food category. When undertaking calculations, it was not always possible to disaggregate between products manufactured in the UK (and therefore using the imported palm oil) and products imported and sold on the UK market. The aim of the numbers is to provide an overview of the relative differences between food-subsectors and highlight progress towards sustainable sourcing of palm oil in particular areas.



*A selection of food products where palm oil is used*

<sup>vii</sup> Panorama is a BBC television programme that undertakes investigative journalism, and undertook a survey of a number of UK companies as part of their documentary on palm oil called 'Dying for a biscuit', which first aired in 22 February 2010.

Food product	Estimated quantity of palm oil and palm kernel oil	Known RSPO certified	GreenPalm
Margarine and spreads	81,000 mt	Likely*	Likely*
Frying fats	51,000 mt	Likely	524 mt (2009)
Food additives	<1% processed food	Yes, Small volume	Likely
Bakery - Bread	4,000 mt	Likely	1,500 mt (2009)
Bakery - Cakes & pastries	Unknown	Likely*	500 mt (2009) 2,953 mt (2010)
Biscuits	150,000 mt	39,000 mt	23,633 mt
Snacks	84,000 mt	Likely*	Likely*
Confectionary	43,000 mt	1,400 mt	12,000 mt (2010)
Diary/dairy replacers	14,500 mt (ice cream only)	Likely*	Likely*
Prepared foods & misc	Unknown	Likely*	13,000 mt

Table 6.1: Estimated quantities of palm oil in UK food products  
 \*Part of company-wide commitments and purchasing strategies

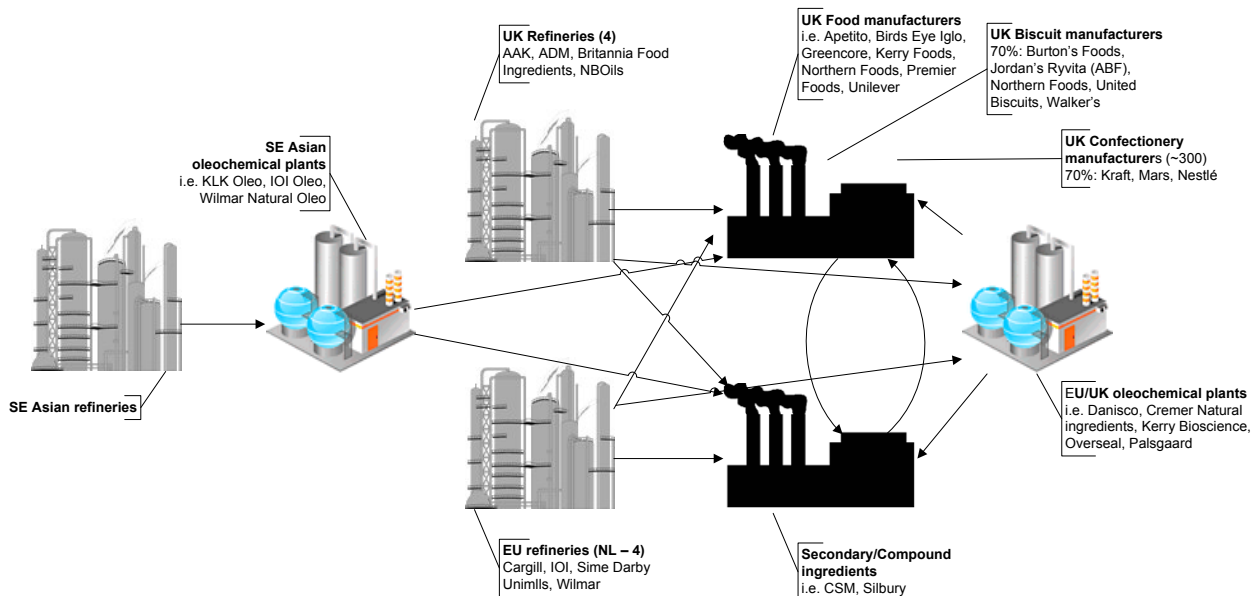


Figure 6.1: Structure of the UK food supply chain, including key players

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## 6.1 Margarine and spreads



(Image source: Craig Newsome\_cc flickr)

Margarine and spreads	
<b>Types of products:</b>	Industrial and consumer margarines and spreads (fat and water blends)
<b>Estimated UK volumes:</b>	81,600 mt. RSPO certified content likely, but unknown.
<b>Palm component:</b>	Palm oil, palm kernel oil, palm olein, palm kernel olein
<b>Key players:</b>	European and UK edible oil refineries (ADM and AAK), manufacturers (Dairy Crest, Kerry Foods, Unilever/Pura Foods).
<b>Implications for policy development:</b>	Main manufacturers are all members of RSPO. The type of palm oil used to make margarine is currently available as RSPO certified, and current available certified volumes could cover the UK's use. Note that because margarine for industrial use and consumer use is manufactured in the same facilities, a significant proportion of margarine will be double counted if the total quantity produced is added to the estimate of palm content in finished food products.

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### 6.1.1 Background

Margarine was originally developed as a substitute for butter, and is used both by consumers as a finished product as well as in industrial baking and processed food manufacture.

Margarine contains a minimum of 16% water and a minimum fat content of 80%, though low-fat spreads (technically not margarines) have lower fat content and higher water content<sup>100</sup>. Typically, the fat content includes a blend of oils including palm oil, palm kernel oil, palm olein, palm kernel olein, rapeseed oil and may also contain soy oil, coconut oil, sunflower oil<sup>101</sup> or cottonseed oil<sup>102</sup>. Depending on the application (as an industrial ingredient or as a finished consumer product), the formulation and relative proportions of oil content will differ<sup>103</sup>. Consumer margarine contains on average around 40% palm oil, palm kernel oil and their fractions and industrial margarine between 50 – 70%<sup>104</sup>, though values as low as 17% and as high as 80% have been reported (for margarine containing palm). Furthermore, a limited number of margarine and spreads available in the UK contain no palm at all<sup>105</sup>.

Palm oil has properties which mean it does not have to be hydrogenated to remain solid at room temperature (unlike rapeseed oil, soy oil and sunflower oil, which need to be hydrogenated to remain solid, for example). Hydrogenation produces 'trans-fats', which are associated with obesity and coronary disease. Trans-free margarine produced for domestic use (i.e. table margarine) usually contains the following components, starting with the highest proportion to the lowest: palm oil, then palm olein, palm stearin, and palm kernel oil<sup>106</sup>.

Edible oil refineries produce Refined, Bleached and Deodorized Palm Oil (RBDPO), Refined, Bleached and Deodorized Palm Kernel Oil (RBDPKO) and their fractions RBD PO and PKO stearin and olein. These ingredients are blended either by the refinery to make margarine or a margarine manufacturer using chilling and fat mixing<sup>107</sup>. Chemical alteration of the palm oil and palm kernel oil can also be undertaken for used in margarine and spreads: interesterification of palm stearin and palm kernel olein is undertaken as well as interesterifying hydrogenated soybean or rapeseed oil with liquid palm oil. Interesterification is not the same as hydrogenation, and does not produce trans-fats<sup>108</sup>.

### 6.1.2 Volumes of palm used for margarines and spreads

The UK is a significant manufacturer of margarine, and produced an estimated 340,000 mt in 2009<sup>109</sup>. The UK also has a net import of 18,700 mt of margarine<sup>viii, 98</sup>.

On this basis, it is estimated that 81,600 mt of the palm oil imported into the UK was used to manufacture margarine, and a further 4,488 mt palm oil equivalent was imported as a finished margarine<sup>ix</sup>.

These estimates do not include palm oil contained in imports of finished food products, of which margarine is a likely significant component.

### 6.1.3 Sustainability in the UK margarine manufacturing sector

The UK is the fourth largest manufacturer of margarine in the EU, with 15% of the market share<sup>111</sup>.

The UK industry is dominated by three major players, though there are more than a dozen larger manufacturers. The three main consumer brand manufacturers of margarines and spreads (Dairy Crest, Kerry Foods and Unilever) are members of the RSPO, as are AAK and ADM, who supply margarine to the food industry but do not manufacture consumer brands.<sup>112</sup>

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<sup>viii</sup> An import of 43,100 mt in 2009, 52% which was from Belgium-Luxembourg and 48% from the Netherlands, and export of 24,400 mt in 2009, mainly to France and Ireland.

<sup>ix</sup> This estimate is based on an average 24% palm content (van Gelder, 2004, including margarines that contain ingredients other than palm.)

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Dairy Crest has processing facilities in Crudgington, Shropshire (Clover, Country Life and Willow) and Kirkby, Liverpool (Vitalite, and Utterly Buttery). St-Hubert spread is manufactured in France.<sup>113</sup> Dairy Crest has stated that they require suppliers to be members of RSPO<sup>114</sup>.

Kerry Foods has a margarine manufacturing plant in Osset, near Leeds. It is operated by Matthews Foods (a subsidiary of Kerry foods), and supplies all of the UK's major retailers, is the primary supplier of fats to the food service trade and works in partnership with a wide range of food manufacturers. Consumer brands include Pure, Lowlow and Dairygold.<sup>115</sup> Kerry Group has similarly stated they only buy palm oil from suppliers who are members of the RSPO, and have indicated the Group 'hopes to produce products made only from sustainable palm oil'<sup>116</sup>. Kerry Foods sourced 1,828 and 100 GreenPalm certificates in 2009 and 2010 (to date) respectively<sup>117</sup>, though it is not known how much of this is attributable to margarine, as they produce a range of consumer foods and ingredients<sup>118</sup>.

Unilever has reportedly the world's largest margarine manufacturing plant in Purfleet, adjacent to ADM's Pura Foods mixed oils refining, blending and packing facility. Pura Foods was previously owned by Unilever and sold the refinery to ADM in 2003<sup>119</sup>. Unilever consumer margarine and spreads brands include Flora, I can't believe it's not butter and Stork<sup>120</sup>. Unilever has made a public commitment to source 100 % sustainable palm oil by 2015 for their global operations, which includes their margarine manufacturing facility in the UK. Given their commitments and role as a major player in the UK margarine sector, it is likely there are already RSPO certified volumes contained within their margarine.



## 6.2 Frying fats



(Image source: Ans Deblauwe\_cc flickr)

Frying fats	
<b>Types of products:</b>	Solid and liquid fats used for cooking and frying, mainly by food manufacturing industry and food service industry (minimal direct use by consumers)
<b>Estimated UK volumes:</b>	55,000 mt palm oil, olein and stearin. Likely some RSPO certified palm oil, plus 524 GreenPalm certificates.
<b>Palm component:</b>	Mainly RBDPalm Olein, also RBDPalm Oil, double fractionated RBD Palm Olein, RBD Palm Stearin and Red Palm Oil and Red Palm Stearin.
<b>Key players:</b>	UK and European edible oil refineries, except for food ingredients fried abroad. UK refineries include AAK, ADM, NBOils; blenders, packers and distributors; distributors; foodservice (fish & chips shops, fast food outlets, catering); food manufacturing (crisps, nuts, instant noodles)
<b>Implications for policy development:</b>	Currently one product line of segregated palm frying fat is known to be available, as well as the purchase of GreenPalm certificates. The Fish Fryers Association has indicated they are actively seeking to source sustainable palm oil. However, because of low visibility of the product (e.g. not an ingredient in final consumer products), awareness of sustainability issues by consumers is likely low.

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## 6.2.1 Background

Palm used in frying includes Refined, Bleached and Deodorized (RBD) Palm Oil, RBD Palm Olein, double fractionated RBD Palm Olein, RBD Palm Stearin and Red Palm Oil and Red Palm Stearin<sup>121</sup>. There is a general preference for the use of palm olein, the low-melting fraction of palm oil. The reasons for this are two-fold. Firstly, the melting point of palm olein (15-25°C) is much lower than that of palm oil (about 38°C) making it much easier to handle and secondly, the degree of unsaturation in palm olein is higher than that in palm oil giving it better nutritional characteristics.<sup>122</sup> Olein can be blended with other oils (such as sunflower, soy or rapeseed oil) or double fractionated to make it more liquid<sup>123</sup>. Straight palm is also supplied as a frying fat and oil, as well as a component of vegetable oil blends.

## 6.2.2 Volumes of palm used for frying fats

It is estimated that approximately 55,000 mt of palm oil, olein and stearin are used as frying oil in the UK. According to industry estimates 5,000 mt of this is used in restaurants and 50,000 mt in fish and chip shops<sup>124</sup>.

Palm oil is not widely used for frying by consumers, but is available in the UK in very limited quantities from specialty food retailers, and is imported from African countries such as Ghana, Ivory Coast and Nigeria<sup>125</sup>.

Note that frying oil is also used in the manufacture snack foods (such as crisps, nuts and instant noodles), which is not included in this total.

## 6.2.3 Sustainability in the UK frying fats sector

The main players in the UK frying fats and oils market are the refineries and distributors. UK refineries AAK and ADM supply frying fats directly to food manufacturers as well as distributors to the foodservice industry. NBOils works with distributors to deliver frying oils to the food manufacturing and food service industries<sup>126</sup>. Distributors may further blend the fats and oils or supply directly to food manufacturers, foodservice distributors or food service outlets.

AAK Foodservice supplies the Prep cooking oil brand, aimed at caterers<sup>127</sup>. ADM Trading supplies the UK foodservice industry with brands such as Frymax (the leading all-vegetable frying fat in the fish and chip market), Leonora Frying Fat (designed for the fried chicken market) and Wesson (designed for fish and chips, fried chicken, breaded products and meats)<sup>128</sup>. Sustainability commitments for AAK, New Britain Oils and ADM have been mentioned previously.

There are over 35 manufacturers and distributors of who further blend and/or distribute the frying fats and oils to food manufacturers and the foodservice industry<sup>129</sup>, and key players include:

- Henry Coleback distributes frying fats and oils to fish and chip shops, as well as independent fast food takeaways, wholesalers and food processors<sup>130</sup>.
- KTC has production and packing plants at Wednesbury and Liverpool and supplies to the foodservice (catering wholesalers) and bakery sectors<sup>131</sup>.



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- Nortech has a production and packing plant, and supplies the catering industry (fish & chip and fast food outlets) with brands such as Surefry and Firstfry as well as boxed palm oil, distributed through its sister company, TQuality<sup>132</sup>. They became the first packed oil company to receive an RSPO supply chain certificate from third party auditors. This follows from the collaboration that was announced in early 2010 between Nortech Foods and NBOils to supply the UK food manufacturing industry with the first packed sustainable palm oil products. Nortech Foods purchased 524 GreenPalm certificates in 2009.
  - Silbury distributes long life frying oil (Fritina) and boxed palm olein and stearin to food manufacturers and wholesalers<sup>133</sup>. Sibury actively promotes the availability of products which are RSPO certified as well as the use of GreenPalm<sup>134</sup>.

There are approximately 8,500 fish and chip specialist eateries in the UK<sup>135</sup>, the majority of which use palm oil for frying purposes. The trade for palm oil to the fish and chip industry are mainly supplied through small regional distributors. With regards to sustainability commitments made by fish and chip eateries, at least 10%<sup>136</sup> of the fish and chip eateries have indicated they are actively moving towards sustainable consumption of palm oil.

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## 6.3 Food additives



(Image source: Kristijan Tkalec\_cc flickr)

Food additives	
Types of products:	Emulsifiers, flavours, colourings
Estimated UK volumes:	<1% processed food by volume. Very limited RSPO certified.
Palm component:	Palm oil and palm kernel oil oleochemical derivatives
Key players:	Danisco (DuPont), Kerry Bioscience, Cremer Natural Chemicals, Overseal.
Implications for policy development:	Food additives derived from palm are oleochemical derivatives, and are not likely to be widely available as sustainable in the near future; while they are a small volume, they are likely to be present in most foods. Steps have taken by two of the major players towards sourcing sustainable palm oil.

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### 6.3.1 Background

Palm oil and palm kernel oil can be fractionated and chemically modified into palm derived food additives. Food additives include colours, preservatives, antioxidants, sweeteners, emulsifiers, stabilisers, thickeners and gelling agents<sup>137</sup>.

For example, colourings such as E160a-f (carotene) can be made from palm oil fractions; antioxidants such as E304 (Ascorbyl palmitate and Ascorbyl stearate), sweeteners/emulsifiers such as E432, E433, E434 and E435 (Polysorbates) from palm oil, olein and stearin fractions, and emulsifiers such as E471, E481 E494 from palm oil, palm stearin and olein fractions respectively<sup>138</sup>. E471, also known as Glycerol monostearate (or 'GMS'), is a particularly important palm derivative, as it is commonly used as a thickening, emulsifying, anti-caking, and preservative agent. It is also used in baking preparations to add body to food, and gives ice cream and whipped cream a smooth texture<sup>139</sup>.

The manufacture of these food additives by olechemical companies uses several vegetable oils (normally coconut and palm kernel oil), purchased from the spot market therefore the derivatives may be a mix of several types of feedstocks. Many of the food additives currently available in the UK will have been made using palm derivatives.

### 6.3.2 Volumes of palm used for food additives

Research suggests that palm-based derivatives (food additives) are likely to make up <1% of food ingredients by volume, and of this not all will be of palm origin. As an example, a UK retailer calculated that 464 g of palm and coconut oils were needed to make the E304 (Ascorbyl Palmitate, an antioxidant food additive) they used in around 2 million litres of orange soft drink<sup>140</sup>.

In 2009, the UK imported 5,232 mt of emulsifiers for fats, and exported around 516 mt, for a net import of 4,715 mt. For flavourings, 47,683 mt were imported and 47,069 exported for a net import of 613 mt<sup>141</sup>. The actual consumption of food additives in the UK is likely higher than the net import, as they are also produced domestically.

The quantity of palm oil and palm kernel oil derivatives used by the UK food manufacturing sector is unknown.

### 6.3.3 Sustainability of the UK food additives sector

The main UK ingredient manufacturers supplying food additives include Danisco, Kerry Foods, Cremer Natural Chemicals and Overseal Natural Ingredients. Despite the challenges of working with oleochemicals, some progress has been made towards sourcing sustainable palm oil.

In 2009, Danisco<sup>x,142</sup> were the first food ingredients manufacturers to offer customers RSPO certified emulsifiers from palm oil or palm kernel oil<sup>143</sup>. Danisco manufactures 'BioActive' food ingredients (cultures and sweeteners), and 'enablers' (emulsifiers, gums, pectins and systems) and are the UK market leaders for palm-based emulsifiers<sup>144</sup>.

Kerry Foods purchased 1,828 and 100 GreenPalm certificates in 2009 and 2010 (to date) respectively, though it is not known how much of this is attributable to food additives, as they produce a range of consumer foods, including ready meals and margarines as well as compound food ingredients<sup>145</sup>. The Kerry Group operates globally, and are market leaders in the development and manufacture of sweet flavourings and emulsifiers for ice cream, confectionery, ready-to-eat cereal, bakery, dairy and nutraceutical product sectors across Europe<sup>146</sup>. Kerry Bio-Science, a subsidiary of Kerry Foods,

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<sup>x</sup> Danisco are in the process of a take-over by DuPont

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manufactures ingredients such as emulsifiers, enzymes, texture systems and fermented ingredients for the baking industry.

Cremer Oleo, a division of The Cremer Group<sup>xi</sup> (the parent company of Cremer Natural Chemicals), is a member of RSPO<sup>147</sup> and a registered GreenPalm member, but has not yet purchased any GreenPalm certificates<sup>148</sup>.

Overseal Natural Ingredients supplies a range of naturally-derived ingredients<sup>137</sup>, including carotene from palm and algae sources<sup>150</sup>. They are not currently an RSPO member.

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<sup>xi</sup> Cremer Oleo coordinates the global marketing, production and logistic activities of its subsidiaries and branches located around the globe

## 6.4 Bakery

(Image source: Baden Wuertemberg\_cc flickr)



Bakery	
<b>Types of products:</b>	Bread, cakes and pastries
<b>Estimated UK volumes:</b>	4,000 mt in bread; of which 1,500 mt GreenPalm in 2010. Cakes & pastries unknown, RSPO certified estimated <50% of the market. GreenPalm 500 mt in 2009 and 2,953 mt in 2010.
<b>Palm component:</b>	Mainly margarines, spreads and shortening sourced from refineries and distributors. Bakery fats used in centre fillings and chocolate coatings are also significant, but volumes are low compared to fats and oils. Palm oil, palm olein, palm stearin, hydrogenated palm kernel oil (biscuit creams and fillings).
<b>Key players:</b>	Allied Bakeries, Premier Foods and Warburton's together account for 80% of the bread and bakery products sales volumes. Cakes and pastry markets are more fragmented, led by Premier Foods (Mr Kipling) and Finsbury Foods. Northern Foods, Greencore and United Biscuits (McVities) are also important players.
<b>Implications for policy development:</b>	Limited number of players dominating the market. Volumes of palm oil in bread are relatively low, and already covered by company purchases and commitments of RSPO GreenPalm and segregated. Volumes of palm oil in pastries and cakes are significantly higher, but market volumes are not known.

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## 6.4.1 Background

Bread includes white bread, brown bread, wholemeal bread, ethnic and speciality bread. Bakery products, also called 'morning goods' include rolls, toasting products (muffins, crumpets and teacakes), scones and buns, seasonal products such as hot cross buns and international products such as croissants and US-style sweet muffins, bagels, pancakes, waffles and potato cakes<sup>151</sup>. Other baked goods include puff pastries, short pastries (for pies) and cakes.

Bakery formulations use palm-containing ingredients such as margarine, spreads and shortening directly in mixes, as well as secondary (or 'compound') ingredients (creams, fillings, coatings) and food additives (colour, flavour and emulsifiers).

Margarine, spreads and shortening (also known as baking fats) are used as ingredients in dough (bread, pastries and biscuits) and in cake batter<sup>152</sup>. As noted above in Section 6.1, margarine and spreads are likely to contain palm oil, palm olein, palm stearin, and palm kernel oil, in combination with other oils as well as water and emulsifiers. Shortening is 100% fat and does not contain water<sup>153</sup>. Vegetable shortening is normally made from palm stearin and palm oil in a blend (or interesterified blend) or with other oils, and tends to be used in biscuits, cakes and short pastries. Industrial bakeries source these ingredients directly from refineries, margarine and spreads manufacturers or distributors.

Creams and fillings are normally made using shortening, or filling/centre fats. The consistency and structure of creams and fillings can be achieved either through the use of hydrogenated vegetable oils or non-hydrogenated palm oil, palm kernel oil and coconut oil. Creams and fillings normally have around 30% fat content, which in the UK is likely to be palm stearin and palm oil<sup>154</sup>. There has been a trend to move away from hydrogenated fats in recent years, increasing palm use<sup>155</sup>. These may be used as cake fillings and icings. They are also used in biscuits and confectionary (see Section 6.5 and 6.7 below).

Coatings, also called 'compound chocolate', 'summer coating' or 'coating chocolate', contains vegetable oil (normally palm kernel oil or hydrogenated oils) instead of cocoa butter. The fat component of the coatings is termed 'chocolate fat' or 'cocoa butter replacer fats'<sup>156</sup>. These are less-expensive alternatives to couverture chocolate, which contains cocoa butter. Coatings are used on cakes and puff pastries, for example.

Industrial bakeries source palm ingredients and palm-containing products directly from refineries that produce primary baking ingredients as well as margarine manufacturers, oils & fats blenders packers and distributors and specialised baking ingredients distributors.

Margarine, spreads and shortening are also supplied to retailers for use by consumers in home baking applications by margarine manufacturers, oils and fats blenders, packers and distributors and specialised baking ingredients distributors.

## 6.4.2 Volumes of palm used for bakery

It is estimated that the bread industry in the UK uses approximately 4,000 mt of palm oil and palm stearin<sup>xii</sup>.

The quantity of palm oil used in the cakes and pastries sector is unknown, but is likely to be at least several times higher than estimated for bread.

xii This estimate is based data provided to BBC's Panorama about the volumes of palm oil used by a bread maker, and their Markey share. This estimate does not include emulsifiers, colour or flavourings.

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### 6.4.3 Sustainability of the UK bakery sector

In 2009 there were 1852 UK manufacturers of bread, fresh pastry foods and cakes and another 220 manufacturers of biscuits, preserved pastry foods and cakes<sup>157</sup>.

Large baking companies produce 80% of bread sold in the UK. In-store bakeries in supermarkets produce about 17% and high street retail bakers produce the rest<sup>158</sup>. The current UK production volume is approximately 4 billion bread units a year<sup>159</sup>. It is estimated that almost 60% of the bread manufactured in the UK covered by GreenPalm certificates for palm oil and palm stearin (equivalent to 2,500 mt)<sup>160</sup>, which will rise to around 80% in 2011 if one of three main players meets their commitments. If the major plant bread makers meet their targets, more than 50% of the bread market will use segregated RSPO palm oil and fractions by 2012.

'Plant' or 'industrial' bread-making is dominated by three main players, Premier Foods, Allied Bakeries and Warburtons<sup>161</sup>, who together account for 78% of the market value and 80% of volume.

Allied Bakeries produce only bread, including the Kingsmill, Burgen, Allinson and Sunblest brands and they have 11 production sites in the UK<sup>162</sup>. Allied Bakeries are RSPO members. On joining the RSPO in 2010, they indicated that they would initially be purchasing Green Palm certificates to cover 100% of their palm oil usage<sup>163</sup> though they have not redeemed Green Palm certificates yet<sup>164</sup>.

Premier Foods has 19 sites in the UK where it produces Hovis brand breads<sup>165</sup>. They also produce other foods at different sites. Premier Foods produces baked goods under the brands Mr Kipling (the market leader in ambient cakes<sup>xiii</sup>), Cadbury and Lyons<sup>166</sup>. Premier Foods are RSPO members and have a commitment to source 100% identity preserved 'blended' (fractionated) Palm Oil from 2012 onwards, and from January 2010 purchasing GreenPalm certificates to cover their volumes of palm oil in 2009, for all food manufacture including bread and cake brands Mr Kipling, Cadbury and Lyons<sup>167</sup>.

Warburton's has the largest bread production volume (and market share)<sup>168</sup>, and currently has 13 bakeries in the UK producing sliced bread, tea cakes, crumpets and rolls<sup>169</sup>. They also have a limited snack range, but are currently not producing any due to a fire at their Bolton bakery in 2010<sup>170</sup>. Warburton's are RSPO members and have committed to sourcing 100% certified segregated sustainable palm oil and palm oil stearin by 2011 or sooner<sup>171</sup>, and they covered their volume of palm oil and palm stearin with GreenPalm certificates in 2009<sup>172</sup>.

Cake manufacturers with sustainability commitments include United Biscuits, who have committed to source 100% of their palm oil from sustainable sources by the end of 2011, and Northern Foods, who have stated they will purchase approximately 60% of palm oil requirements as RSPO segregated from January 2010 (all bulk oil) and by January 2012 all palm oils and fats will be either RSPO GreenPalm or segregated<sup>173</sup>. However, the major bakery and cake manufacturers, Finsbury's and Greencore, do not have public commitments to sourcing sustainable palm oil. On this basis, it is estimated that well under 50% of palm used in pastries and cakes is RSPO certified palm oil or fractions or covered by GreenPalm certificates.

Finsbury Foods is an important player for both breads and cakes, and has around a 50% share in the UK celebration cake market<sup>174</sup>. The group includes the following subsidiaries: Memory Lane Cakes, Lightbody, Anthony Allen (distributing Weight Watchers cakes, made in a range of UK bakeries); Nicholas & Harris (the largest baker of organic bread in the UK, with a production site in Salisbury and brands include Vogel's, the Village Bakery and Cranks); California Cakes (a distributor for smaller

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xi Ambient cake refers to the storage temperature (as opposed to frozen cake)



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suppliers); Campbells Cakes, United Central Bakeries (mainly producing own-brand products for supermarkets) and Livwell (gluten free)<sup>175</sup>. Other key players include:

- Greencore Cakes & Desserts, a major producer of cakes and UK market leader in the supply of Christmas Cakes and chilled non-dairy Desserts. The bakery is located in Hull<sup>164</sup>. Greencore purchased 1,425 mt of GreenPalm in 2010 for all their food business.
- McCambridge, manufacturing cakes, mince pies and Soreen malt loaf in England, bakery products in Poland and soda bread in Ireland. Customers include all of the major supermarket groups in the UK, Ireland and European and global retailers. It has manufacturing locations in Blackburn, Bradford, Manchester, Salisbury, Rathcoole in County Dublin and Szczecin in Poland<sup>177</sup>.
- Northern Foods' business Matthew Walker produces Christmas puddings, including branded as well as for retailers' own-brands as well as a range of other puddings and cakes<sup>178 179</sup>.
- Samworth Brothers, whose brands include Ginster's pasties, and Charnwood Bakery pork pies, each with one manufacturing site<sup>181</sup>. Samworth has purchased GreenPalm certificates to cover Ginster's and Charnwood's palm oil use, including 500 mt in 2009 and 2,953 mt in 2010<sup>169</sup>. No other savoury pie companies are known to have redeemed GreenPalm certificates.
- United Biscuits, who have one McVities cake manufacturing site in the UK<sup>182</sup>, and is second in the UK cake market<sup>183</sup>.
- CSM is one of the global leaders in the supply of bakery ingredients, and is an RSPO member<sup>184</sup>.

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## 6.5 Biscuits



(Image source: Caro Wallis\_cc flickr)

Biscuits	
<b>Types of products:</b>	Sweet biscuits (cookies) and savoury biscuits (crackers)
<b>Estimated UK volumes:</b>	150,000 mt, of which at least 63,000 mt is RSPO certified or GreenPalm.
<b>Palm component:</b>	Mainly margarines, spreads and shortening sourced from refineries and distributors. Bakery fats used in centre fillings and chocolate coatings also significant, but volumes are low compared to fats and oils. Palm oil, palm olein, palm stearin, hydrogenated palm kernel oil (biscuit creams and fillings).
<b>Key players:</b>	United Biscuits, Burton's Foods, Northern Foods, Jordan's Ryvita and Walker's shortbread.
<b>Implications for policy development:</b>	It is a consolidated industry, dominated by United Biscuits, who are covering their volumes with RSPO segregated, mass balance and GreenPalm. There is a push to reduce saturated fats in sector, which means reducing palm oil content.

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### 6.5.1 Background

Similar to bread, cakes and pastries (described in the previous section), biscuits use margarine, spreads and shortening in biscuit dough mixes that can contain palm. Additionally, biscuit creams, fillings and coatings as well as colouring, flavouring and emulsifiers are also likely to contain palm.

Higher fat content of biscuits is indicative of palm oil content. Short sweet biscuits have the highest fat content reportedly around 25%, followed by digestives (around 20%), semi-sweet biscuits (around 15%) and cream crackers (around 13%). Shortbread has a high fat content compared to other biscuit types (minimum 24%), however most shortbread contains butter rather than palm. Blends of butter and margarine (likely containing palm oil) can also be used (and are still allowed to be labelled as 'contains butter'). For cream crackers and digestive biscuits, the percentage of saturated fat increased from 1998 to 2006 which is consistent with a switch from hydrogenated vegetable oils to non-hydrogenated alternatives (palm oil and palm stearin)<sup>185</sup>, however, biscuit manufacturers are now seeking to decrease the amount of saturates in their products.

### 6.5.2 Volumes of palm used for biscuits

It is estimated the UK biscuit market uses around 150,000 mt<sup>xiv</sup> of palm oil, palm kernel oil and fractions. Biscuits contain on average an estimated 30% by volume of palm oil and palm fractions<sup>186</sup>. This does not include finished products imported, though it is worth noting the UK is a net exporter of biscuits<sup>187</sup>.

### 6.5.3 Sustainability of the UK biscuit sector

The UK biscuit market is dominated by United Biscuits. Burton's Foods, Northern Foods, Jordan's Ryvita and Walker's are also important players. In total, it is estimated that around 39,000 mt of RSPO segregated palm oil is being used in UK biscuit manufacturing, and a further 24,000 mt of GreenPalm.

United Biscuits have two UK production sites for savoury biscuits (United Biscuit brands include Jacob's, Carr's and Krackawheat) and four production sites for the McVities sweet biscuits brand (and one for McVities cakes)<sup>188</sup>. BN biscuits are made in France. They also produce snacks including nuts and crisps. In the savoury biscuit market, United Biscuits has around 40% market share. The McVities brand (United Biscuit's top brand) accounts for more than 20% of UK biscuit sales<sup>189</sup>, and Jacob's has around 6% market share. Around 71 million packets of McVitie's Chocolate Digestives are consumed in the UK each year<sup>190</sup>. They also manufacture own-label products for retailers. United Biscuits have made a sustainability commitment to source 100% of their palm oil from sustainable sources by the end of 2011. Currently, United Biscuits source approximately 96% of palm oil from sustainable sources, including from RSPO segregation, mass balance and GreenPalm certificates<sup>191</sup>. Additionally, they reduced the amount of palm oil use in their products by 17% from 2005 to 2007<sup>192</sup>.

Burton's Foods Limited produces Cadbury's fingers and digestives under license licence from Kraft, as well as Maryland Cookies, Jammie Dodgers, and Burton's Food branded biscuits as well as other confectionary. They have four UK production sites<sup>193</sup> and around 15% market share. Burton's Foods has committed to covering 100% certified sustainable Palm palm oil and palm oil fractions from 1st January 2010 and to cover 100% segregated certified sustainable palm oil by 1st January 2013<sup>194</sup>.

xiv This estimated is based on volumes of GreenPalm certificates redeemed by a major biscuit manufacturer, calculated using their market share

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Other key players include:

- Allied British Foods (also the parent company of Allied Bakeries), producing biscuits under the Jordan's Ryvita brand. They have a mill and bakery in Poole, Dorset<sup>195</sup>.
- Northern Foods, producing the savoury Fox's biscuit brand as well as own-label retailer brands at three UK manufacturing sites<sup>196</sup>, and is estimated to have around a 10% market share<sup>197</sup>. As noted above, Northern Foods have committed by January 2012 to all palm oils and fats will be either RSPO GreenPalm or segregated<sup>198</sup>.
- Walker's makes shortbread, oatcakes, fruit bread, and biscuits (including the Duchy Originals Ltd brand). They one single production site in Scotland<sup>199</sup>
- Nestlé UK Ltd, producing an in-store bakery range which includes Smarties, Quality streetStreet, Rolo, Toffee crisp Crisp and Yorkie cookies<sup>200</sup>.
- Kraft recently launched the Oreo brand in the UK as well as the Belvita Breakfast biscuit, and produces Mikado biscuits and Ritz crackers<sup>201</sup>, but these are not manufactured in the UK<sup>202</sup>.

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## 6.6 Snacks



(Image source: Gary Tanner\_cc flickr)

Snacks	
Types of products:	Crisps, nuts, other starch-based snacks; instant noodles
Estimated UK volumes:	Around 84,000 mt palm olein. RSPO certified unknown.
Palm component:	Frying fats and oils (palm oil and palm olein)
Key players:	PepsiCo (Walker's, Doritos, Monster Munch, Red Sky and Snack-a-Jacks), United Biscuits (McCoy's, Phileas Fogg, Skips, Hula Hoops, Twiglets and KP nuts), Tayto Group (Tayto, Golden Wonder, Real, and Mr. Porky); Premier Foods (Batchelors); Unilever (Pot noodles).
Implications for policy development:	Palm used in the snack industry has decreased significantly in the past 5 years, replaced by sunflower oil for health (and marketing) reasons related to consumer concerns about saturated fats.



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### 6.6.1 Background

Snacks include crisps, nuts, other starch-based snacks, as well as instant noodles.

The EU market for snacks is more than 1.5 million mt a year, of which more than 35% by volume is potato chips (crisps). The UK is the largest EU consumer of savoury snacks, consuming over 430,000 mt a year; which has a retail value of about £3.4 billion<sup>203</sup>.

Historically, crisps and nuts have been fried using palm olein. However, a number of UK retailers and manufacturers have sought to use sunflower oil for crisp frying in recent years, because of increased consumer concerns about saturated fats.

### 6.6.2 Volumes of palm used for snacks

Estimates from 2005 put the use of palm oil in snack manufacturing at 105,000 mt of palm oil<sup>204</sup>, however, this is unlikely to capture the reduction in use by palm olein as a frying oil in the crisps industry. On this basis, it is estimated that currently up to 11,000 mt<sup>xv</sup> of palm olein is used for frying crisps, with a further 70,000 mt<sup>xvi</sup> of palm olein used for other snacks.

A further 3,000 mt is estimated in the manufacture of instant noodles<sup>205</sup>.

Therefore, the total estimate is 84,000 mt of palm oil, palm kernel and direct fractions used in the snack industry.

### 6.6.3 UK snack sector

In the UK, it is estimated that 290,000 tonnes of crisps are produced annually, with at least 70% of the sector using sunflower oil.

PepsiCo snack brands include Walker's, Doritos, Monster Munch, Red Sky and Snack-a-Jacks. Walkers represents approximately 47% of the UK crisps market share, and over 11 million bags of Walker's crisps are produced per day, equivalent to around 136,620 mt annually<sup>xvii</sup>. Their production facility in Leicester is the world's largest potato crisp plant. They also have plants in Lincoln, Peterlee (county County Durham), Skelersdale (producing Walker's, Monster Munch and Snack-a-Jacks) and Coventry (mainly Doritos and extruded products<sup>206, 207</sup>). Walker's started blending sunflower and palm olein in 2004 and phased out palm olein entirely by 2006<sup>208</sup>.

United Biscuits produces the McCoy's and Phileas Fogg crisps, Skips, Hula Hoops, Twiglets and KP nuts.

Proctor & Gamble owns the Pringles brand, and mainly use sunflower oil, as well as a small amount of palm oil which they have indicated they are in the process of reducing<sup>209</sup>. P&G have stated that by 2015 that they are intend intent on purchasing palm oil have originating from responsible and sustainable sources<sup>210</sup>.

Tayto Group Limited is third largest snack manufacturers in the UK, packing about 5 million bags of crisps a day<sup>211</sup>. Brands Tayto (crisps), Golden Wonder (crisps), Real (hand cooked crisps) and Mr. Porky (pork scratchings). The Tayto group have manufacturers in six locations throughout UK, including England, Wales and Northern Ireland. The crisp brands under the Tayto group use 100% sunflower oil in manufacturing<sup>212</sup>.

<sup>xv</sup> This has been calculated assuming a 35% crisp market share in the UK snacks industry (therefore 35% of the 105,000 mt) and that Walker's and the Tayto Group account for around 70% of the crisps market, and both use sunflower oil.

<sup>xvi</sup> This is equivalent to approximately 65% of the 105,000 mt estimated in 2005

<sup>xvii</sup> Assumption that each bag of Walkers Crisps weighs 34.5g

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There are also a number of premium hand-cooked crisp brands including Tyrell's (with production in Herefordshire)<sup>213</sup>, Burt's crisps (in Devon)<sup>214</sup>, Kettle Chips (with a factory in Norwich, owned by Diamond Foods in the US)<sup>215</sup> and Yorkshire Crisps<sup>216</sup>, all of which are fried in sunflower oil.

Manufacture of instant noodles is estimated at 18,519 mt<sup>xviii</sup> in the UK and Ireland with the main producers being Tayto (Golden Wonder), Unilever, and Premier Foods (Batchelors). Unilever's Pot Noodle brand has a 77% market share in both the UK and Ireland<sup>217</sup>.

<sup>xviii</sup> Based on the estimation that 155 million pots of Pot Noodle (net weight of 92g) by Unilever, representing approximately 77% of market share in UK and Ireland.



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## 6.7 Confectionery

(Image source: Jesper Sachmann\_cc flickr)



Confectionery	
<b>Types of products:</b>	Chocolate bars, blocks, boxed chocolates and bite-size products and sugar confectionery (including fruit sweets, mints and chewing gum), fudge
<b>Estimated UK volumes:</b>	43,000 mt, including in chocolate as well as coatings and fillings. Estimated 1,400 mt RSPO certified and 12,000 mt GreenPalm in 2010.
<b>Palm component:</b>	Confectionery fats, Cocoa Butter Replacers (CBR) and Cocoa Butter Equivalents (CBE)
<b>Key players:</b>	Kraft (including Cadbury's and Green & Black's), Mars (including Wrigley's) and Nestlé.
<b>Implications for policy development:</b>	If the 2015 commitments to purchase RSPO are met by the major players, 70% of the UK confectionery market would be addressed.

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### 6.7.1 Background

The confectionery market can be divided into two broad sectors: chocolate confectionery ('countlines' and moulded bars, blocks, boxed chocolates and bite-size products), and sugar confectionery (including fruit sweets, mints and chewing gum).

There are three types of palm based confectionary fats used in chocolate. These are Cocoa Butter Equivalent (CBE) fats, which can be mixed with cocoa butter in any proportion (palm oil mid-fractions), Cocoa Butter Extenders or Replacers, which can be used at 10 – 15% of the cocoa fat content or replacing cocoa fats entirely (partly hydrogenated double fractionated palm olein) and fats for coatings and toffee fats (fractionated or partly hydrogenated palm kernel oil)<sup>218</sup>.

A standard Cocoa Butter Equivalent (CBE) contains around 50% exotic fats and 50% palm oil<sup>219</sup>. 'Soft' cocoa butter equivalents are typically used in the UK and Ireland, and contain up to 30% exotics and 70% palm mid fractions (compared to 'hard' CBE which contain higher proportions of exotics to palm oil)<sup>220</sup>.

In the EU, there is a Chocolate Directive which defines milk chocolate as having a minimum of fat content of 25%, not including vegetable oils. For a typical low-cost milk chocolate recipe with 28.3% fat, the maximum vegetable fat that can be added is 3.3%. Chocolate for use in ice cream or similar may contain up to 5% vegetable fat other than cocoa butter<sup>221,222</sup>. Confectionery with greater than 5% Cocoa Butter Equivalent cannot be labelled as chocolate.

The Chocolate Directive does not cover chocolate coatings and fillings. Chocolate fillings may include for example, hazelnut, praline, toffee, wafers or other fat products. Fillings in chocolates may use coconut or palm kernel oils or CBEs containing palm mid-fractions<sup>223</sup>.

Toffees and caramels are also likely to contain palm oil, at around 7.5% of volume. Toffee fats can include interesterified hydrogenated palm kernel oil and palm oil, hydrogenated palm kernel stearin, palm kernel olein and palm olein or hydrogenated palm kernel oil<sup>224</sup>.

Palm oil is used as an ingredient in the production of sweet confectionary confectionery cream products.

### 6.7.2 Volumes of palm used for confectionary

It is estimated that the UK confectionary sector uses around 40,000 mt of palm oil a year<sup>xix</sup>.

The UK consumption of chocolate bars and biscuits is around 500,000 mt per year, and equivalent to about 24% of the 2.2 million mt EU-15 market. UK production is around 400,000 mt, equivalent to 17% of the 2.4 million mt of chocolate produced in the EU-15<sup>225</sup>. Use of Cocoa Butter Equivalents by UK chocolate manufacturers has been calculated at 4.1% of product content<sup>226</sup>.

In 2005, an estimated 34,000 mt of palm oil mid-fractions were used to produce Cocoa Butter Equivalents in Europe, out of a total 58,600 mt vegetable oils used. Of this vegetable oil, approximately 20,000 – 25,000 mt was used to make fillings and coatings<sup>227</sup>. On the basis of the UK market share (17%), it is estimated at least another 3,060 mt<sup>228</sup> was used for fillings and coatings. These estimates do not include Cocoa Butter Replacers, and in practice, 'chocolate' coatings (known as 'supercoatings') may contain much higher proportions of CBEs or CBRs, but they must be labelled as a 'chocolate flavoured coating'<sup>229</sup>.

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<sup>xix</sup> This estimate is based on interviews and purchases of GreenPalm certificates, taking into account the market share of these companies and assuming the same profile of palm usage across companies in the sector.

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### 6.7.3 Sustainability of the UK confectionary sector

In 2009, there were a reported 291 manufacturers of cocoa, chocolate and sugar confectionery in the UK<sup>230</sup>. Confectionery fats, Cocoa Butter Equivalents and Replacers are normally purchased by food manufactures from specialty fats suppliers, such as Britannia Foods, in the UK.

The UK confectionary confectionery market is dominated by Kraft, Mars and Nestlé, together making up around 70% of the chocolate market<sup>231</sup>. They have all committed to sourcing either 100% RSPO certified or GreenPalm by 2015. It is estimated that 12,000 mt of GreenPalm certificates and 1,400 mt of RSPO certified palm oil were purchased by the UK confectionary sector in both 2009 and 2010.

Cadbury, a Kraft company, are presently purchasing GreenPalm certificates for their supply. In 2009, Cadbury Holdings purchased 8,104 mt PKO GreenPalm certificates and 26,426 mt palm oil GreenPalm certificates<sup>232</sup>, though they have manufacturing facilities outside of the UK<sup>xx</sup>. Cadbury is committed to converting to sustainable palm oil by 2014<sup>233</sup>. Kraft acquired Cadbury Plc in 2010, taking their market share from 3% to around 30%<sup>234</sup>. Cadbury UK chocolate brands include Dairy Milk, Crunchie, Caramel, Wispa, Boost, Picnic, Flake, Curly Wurly, Chomp, Fudge; Chocolate Buttons, the boxed chocolate brand Milk Tray and Cadbury Heroes. They also produce sugar confectionary under the brands Maynards, Halls, Liquorice Allsorts, Jelly Babies, Flumps, Mints, Dolly Mix, Black Jack chews, Trident gum, and Softmints.<sup>235</sup> Green & Black's is owned by Cadbury Plc<sup>236</sup>. Other Kraft brands include Terry's chocolate orange, Toblerone, Cote d'Or, Terry's All Gold and Daim<sup>237 238</sup>.

Mars have an intermediary target to source up to 20% of palm oil from sustainable sources by the end of 2010 of their European volumes, and to source 100% RSPO certified palm oil by 2015<sup>239</sup>. Mars purchased 3,800 Green Palm certificates in 2010. Mars Masterfoods' chocolate brands include Bounty, Celebrations, Flyte, Galaxy, M&M's Maltesers, Mars, Milky Way, Revels, Snickers, Seeds of Change, Topic, Tracker and Twix<sup>240</sup>. They have around a 24% market share. They also own Wrigley's, whose brands include confectionary sweets Airwaves, Doublemint, Extra, Hubba Bubba, Juicy Fruit, Locketts, Orbit, Skittles, Starburst, Tunes and Wrigley's spearmint<sup>241</sup>.

Nestlé have made a public commitment to using only certified sustainable palm oil by 2015. Nestlé predominately uses processed palm oil and oil mixes for their products. Nestlé chocolate brands include Aero, Heaven, KitKat, Milkybar, Yorkie, Rolo, Smarties, After Eight, Black Magic, Dairy Box and Quality Street. They also product produce sugar confectionary brands Polo and Rowntrees<sup>242</sup>. They have around a 16% market share.<sup>243</sup>

Thornton's is the largest independent chocolate and confectionery company in the UK including manufacture, distribution and retail of confectionery across the UK, with 377 shops and cafes and 222 franchises together with internet, mail order and commercial services<sup>244</sup>. They are a registered member of GreenPalm, and purchased 250 mt of palm oil and 250 mt of PKO equivalent certificates in 2010<sup>245</sup>.

Ferrero (whose brands include Nutella, Tictac, Ferrero and Kinder)<sup>246</sup> has started buying RSPO certified sustainable palm oil, and they have signed an agreement for supply from New Britain Palm Oil, which will cover around 25% of their requirements starting from 2011.

Haribo (Haribo and Moam fruit gums, Liquorice and foam based sweets)<sup>xx</sup> is also an RSPO member.

<sup>xx</sup> Cadbury operates in the UK, Ireland, Australia, New Zealand, India and the US.

## 6.8 Dairy and dairy replacers



(Image source: Robyn Lee, cc flickr)

Diary and dairy replacers	
<b>Types of products:</b>	Ice cream, non-dairy ice cream, non-dairy creamers, milk fillers, processed cheese
<b>Estimated UK volumes:</b>	14,500 mt, of which a portion is likely RSPO certified.
<b>Palm component:</b>	Palm oil, palm kernel oil, hydrogenated palm oil and palm kernel oil
<b>Key players:</b>	Ice cream: Frederick's Dairies, Mars Ice Cream, Nestlé, R&R ice cream, Unilever. Frozen desserts: PloeStar, Greencore. Ingredients suppliers: Garrett Ingredients, Caterlink.
<b>Implications for policy development:</b>	Around half of the ice cream market is small-scale producers and retailers, which could make applying policy challenging, unless it is targeted further upstream in the supply chain.



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### 6.8.1 Background

In dairy products such as ice cream, whipped cream, coffee whiteners, and cheese powders milk fats can be substituted with palm oil products.

In the EU, anything sold as “ice cream” must contain a minimum of 5% vegetable fat, such as coconut or palm oil, while anything sold as “dairy ice cream” must contain a minimum of 5% cow’s milk fat<sup>247</sup>. Vegetable (non-dairy) fats are used extensively as fat sources in ice cream in the UK, parts of Europe, the Far East, and Latin America, but for legal reasons only to a very limited extent in North America<sup>248</sup>. Most of the UK’s ice-cream would not be classified as dairy ice-cream in European terms, as about 80% contains no milk fat<sup>249</sup>. The UK premium ice cream market (e.g. containing milk-fats) accounts for about 25% of the value of the sector<sup>250</sup>.

In ice cream, hardened palm kernel oil is often used to replace milk fats. Less expensive ice cream products are more likely to contain vegetable oils instead of milk fats<sup>251</sup>. Formulations can contain 10 – 12% dairy-replacer fats, which are likely to be palm oil and palm oil products<sup>252</sup>. A further 0.2 - 0.5% of the product by volume is stabilizers and emulsifiers, which are also likely to have been derived from palm oil<sup>253</sup>. Single serving ice cream products may also have coatings or supercoatings, which are likely to contain palm.

Non-dairy creamers (used in coffee and tea) may use palm oil, palm olein, super olein, palm kernel oil and palm kernel olein<sup>254</sup>. These are similar to ‘filled milk’ products, where butter fats are replaced with partially hydrogenated PKO or palm oil and mixed with skimmed milk powder or sodium caseinate, though filled milk products have a lower fat content and use palm kernel oil or hydrogenated palm oil<sup>255</sup>.

It is also possible to use transesterified palm kernel olein as a substitute for milk-fat in processed cheese<sup>256</sup>.

### 6.8.2 Volumes of palm used for dairy and dairy-replacers

Ice cream is the largest user of palm oil in terms of the replacement dairy product industry; the UK retail market for ice cream is an estimated 259,194 mt<sup>257</sup>. Research has indicated that blends of 75% fractionated palm kernel oil or coconut oil and 25% of unsaturated oil (e.g. sunflower oil) or 50% milkfat, 37.5% fractionated palm kernel or coconut oil, and 12.5% sunflower oil work well<sup>258</sup>. On this basis, palm oil use in ice cream is an estimated 14,500 mt<sup>xxii</sup>.

The palm component of non-dairy creamers is about 20%<sup>259</sup>, and non-dairy whipped topping (whipped cream alternatives) can use palm stearin and double fractionated palm olein making up the fat content of 25 – 40% by volume<sup>260</sup>.

The volume of palm oil used in creamers and whipped topping in the UK market is unknown.

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<sup>xxii</sup> Assuming 80% of the market uses dairy-fat replacers, the fat content of ice cream is 10% and the palm oil content in the dairy-fat replacers is an average of 70%

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### 6.8.3 Sustainability of the UK dairy and dairy-replacer sector

In terms of sustainability, public commitments from the largest ice cream manufacturers, such as Unilever's Walls, and Nestlé are not made on a product, but for the company as a whole. Both have commitments to source sustainable palm oil by 2015.

In 2009, there were a reported 535 dairy manufacturers in the United Kingdom, 236 of which are ice cream manufacturers<sup>261</sup>. The ice cream market is dominated by Unilever, with brands including Ben & Jerry's, Carte D'Or and Wall's. Other major players include Nestlé (Dreyers, Hagen Dazs, Nestlé and Nestlé Extreme)<sup>262</sup>, whose brands are manufactured under license by R&R ice cream (formerly Richmond Foods<sup>263</sup>, and who also are the market leaders in producing ice cream for retail own-branded ice creams<sup>264</sup>), Mars Ice Cream and Frederick's Dairies (which manufactures under license licence for Cadbury). About half of the market is taken up by the several hundred small independent companies, which who mostly employ fewer than ten people, and sell only locally<sup>265</sup>.

The frozen dessert market is less strongly branded. In 2009, Heinz sold off its interests to PoleStar Foods, while Greencore also sold some of its frozen desserts interests. Greencore purchased 1,425 mt of GreenPalm certificates in 2010<sup>266</sup>.

Garrett Ingredients supplies the dairy industry with a range of speciality ingredients including ice cream mix, fat-filled milk powders (contain palm and coconut oils) and boxed palm oils, for example<sup>267</sup>. Caterlink also distribute ice cream mixes and related products for the foodservice sector such as cafes<sup>268</sup>. Neither has public commitments related to sustainable palm oil.

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## 6.9 Other food products

### 6.9.1 Background

A number of other food products not covered in the above sections contain palm oil.

Prepared foods can be defined as food that has been prepared for consumption, such as ready-made fresh and frozen meals<sup>255</sup>, with the exception of bakery items. Products can include yoghurts, salads, sandwiches, pizza, quiche, dressing, sauces, and TV-dinners for example. The content of palm oil in prepared foods will vary widely since the category encompasses such a broad range of products.

Pizza is estimated to have around 3% by volume of palm oil of raw materials<sup>270</sup>.

Peanut butter is estimated to contain approximately 2% of hard grade palm stearin<sup>271</sup>.

Small amounts of palm oil derivatives or palm kernel oil are used for the wax-like coating on vegetables and fruit.

Sauces, mayonnaise and salad oils are also likely to contain palm oil.

### 6.9.2 Sustainability of the prepared and other foods sector

In addition to the sustainability commitments already examined in previous sections, many of these companies such as Northern Food, Premier Foods and Unilever are also producing prepared foods and ready meals, all of whom have 2015 targets for sustainable palm oil. For example, Northern Foods manufacturers ready meals for Marks & Spencer, Morrisons and Tesco<sup>272</sup>.

Birds Eye Iglo (owned by Pinnacle Foods) is the largest frozen food brand business in Europe, and has committed to using GreenPalm for their palm oil use by 2011. While they state that don't fry any of their products in palm oil, they have indicated it is used in glazing or in batter blends, and in some products where palm oil is present in the ingredient, such as margarine for pastry based products<sup>273</sup>.

The Findus Group (including the Findus, Young's and The Seafood Company brands) is a frozen and chilled food manufacturer<sup>274</sup>. They indicated that in 2009, they used approximately 2,500 mt of palm oil, which was expected to reduce to 1,500 mt in 2010<sup>275</sup>. They purchased 3,000 mt of GreenPalm certificates in 2010<sup>276</sup>.

Apetito is a European company that makes frozen food and catering products for care homes, local authorities and hospitals<sup>277</sup>. They have indicated that their suppliers are members of the RSPO, though do not have specific public commitments with respect to sourcing<sup>278</sup>.

Greencore is an international producer of convenience foods, including chilled foods (sandwiches, read-meals, sauces and soups), frozen foods and cakes and desserts (mentioned in previous sections of the report)<sup>264</sup>. They purchased 1,425 mt of GreenPalm certificates in 2010<sup>280</sup>.



# 7. Use of palm in feed

## 7.1 Animal feed



(Image source: Chris Metcalf\_cc flickr)

Animal feed	
Types of products:	Livestock feed, pet food, fish food.
Estimated UK volumes:	150,000 mt CPO, PFAD; 550,000 mt PKM. No RSPO certified material.
Palm component:	CPO, PFAD, PKM
Key players:	ABAgri, BOCM Pauls, ED&FMan
Implications for policy development:	Currently there is little awareness of sustainability of palm oil in the feed industry, though there is evidence that this is starting to change. Palm Kernel Meal is often described as a by-product, and some have argued that for this reason sustainability concerns are not an issue.

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### 7.1.1 Background

Palm oil and palm kernel meal is a component of animal feed used for commercial livestock (such as cattle, sheep and pigs), pet food (such as for cats and dogs) as well as domestic and commercial fish food<sup>281</sup>.

Compound feed is the most significant use of palm products in the animal feed sector. It is composed of a combination of ingredients (including cereal grains, oilseed products and pulses) which are blended together. Compound feed is made up of agricultural raw materials (mainly grains) normally comprising up to 98% of feed volume, and 2% pre-mix (including feed additives of around 0.5%)<sup>282</sup>. Several palm products are used to manufacture compound feed, including crude palm oil (CPO), palm fatty acid distillate (PFAD) and palm kernel meal (PKM). Palm kernel oil (PKO) is currently not used in UK animal feeds, though it was historically common in pig creep diets and calf milk replacers (currently there is a preference for coconut oil for these feeds)<sup>283</sup>.

'Straights' are raw materials such as wheat, soya and barley which are traded as commodities and sold directly to farmers, and can be mixed with home-grown products to create 'home mix feed'. It is estimated that they account for 52% of the total UK animal feed market, with compounds feed accounting for the remaining 48%<sup>284</sup>.

Premix is mixture of feed additives on a carrier which is often a mineral feed material such as calcium carbonate<sup>285</sup>. Specialised companies called 'premix manufacturers' generally supply directly to farmers, rather than compounders. The major UK supplier of premix, UFAC, does not use palm products. The only UK manufacturer using palm products for pre-mixes takes about 50 mt of palm per annum<sup>286</sup>.

CPO<sup>xxiii</sup> can be used in animal feed as a fat supplement. In the UK, poultry rations have approximately 5% fat, which would typically be 50% CPO; pig rations have approximately 1.5% fat, which would typically comprise up to 70% CPO. There is a limited use of straight CPO (<1%) in dairy rations.<sup>287</sup>

PFAD<sup>xxiv</sup> is used extensively in feed as a fat supplement in livestock feed (particularly in dairy cow rations, as it increases butterfat). Because it has a high melting point, this makes it difficult for compounders to handle without specialist handling experience<sup>288</sup>, and PFAD is often mixed with other fats by intermediaries. Compound feed manufacturers and pre-mixture manufacturers purchase PFAD from commodity traders.

PKM<sup>xxv</sup> is rich in proteins, energy and fibre and is primarily used in ruminant feeds. In the winter, PKM provides a relatively cheap source of top up dry matter to balance slower growing and less available grass<sup>289</sup>. PKM used in animal feed is mainly imported from South East Asia, with the bulk coming from Indonesia and Malaysia (see Figure 3.4). PKM from West African sources are less preferred because of problems with comparatively higher levels of toxins<sup>xxvi</sup> compared to South-East Asian sources<sup>290</sup>. It is important to note that palm kernel meal as a protein source in feed competes with other protein sources, and is entirely replaceable by other proteins / fats<sup>291</sup>.

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<sup>xxiii</sup> The feed industry in UK currently does not use Refined Bleached Deodorized Palm Oil (RBDPO)

<sup>xxiv</sup> PFAD is a by-product from the physical refining of crude palm oil, and is composed of free fatty acids, glycerides, and Vitamin E

<sup>xxv</sup> This is the remains of the oil palm kernel left over after the oil has been mechanically expelled, followed by solvent extraction

<sup>xxvi</sup> Aflatoxin B1 is a naturally occurring mycotoxins, and is a genotoxic carcinogen and a strong acute toxin in various animal species

Ruminants	PKM	Pigs	PKM	Poultry	PKM
Calf	5	Creep	0	Chick	0
Dairy	20	Weaner	0	Broiler	0
Beef	20	Grower	2.5	Breeder	0
Lamb	5	Finisher	5	Layer	0
Ewe	10	Sow	2.5		

Table 7.1: The maximum recommended inclusion rates in compounds or complete feeds for Palm Kernel Meal (PKM) for the major species groups in the UK (Source:Defra)<sup>292</sup>

### 7.1.2 Volumes of palm used for animal feed

The European feed industry is estimated to use around 5% of the total palm oil used in Europe<sup>293</sup>. An estimated 150,000 mt/year of palm oil is used in the UK feed industry, which is equivalent to ~1% of UK feed ingredients and around 23% of the total palm oil and direct fractions imported<sup>xxvii</sup>. In 2009, approximately 70,000 mt of this was PFAD (around 20,000 mt from UK and EU refineries and 50,000 mt from Malaysia and Indonesia)<sup>294</sup>, and 80,000 mt CPO<sup>xxviii</sup>.

As an ingredient, copra (coconut kernel) and palm kernel meal (PKM) accounts for around 2% of protein rich feed materials used in European compound feed<sup>295</sup>, of which around 1.5% of the total is PKM<sup>296</sup>. The estimated total PKM used for feed in 2009 is around 550,000 mt, which is 83% of the PKM imported into the UK (total PKM imported in 2009 was 663,300 mt<sup>297</sup>)<sup>xxix</sup>.

### 7.1.3 UK animal feed sector

Sustainability of palm oil and PKM is not currently a significant consideration in the feed sector. However, there are indications that this is changing. For example, in November 2010, GreenPalm introduced tradeable certificates for PKM, however, as of yet none have been purchased<sup>261</sup>. To date several American, Australian and New Zealand suppliers have expressed interest in purchasing GreenPalm certificates for their PKM<sup>299</sup>, which is likely due to pressure from NGOs, such as a Greenpeace campaign in New Zealand<sup>300</sup>.

There are currently 410 feed manufacturing enterprises in the UK, including 254 farm animal feed manufactures and 156 pet food manufacturers<sup>301</sup>. In 2009, the UK compound feed industry manufactured 13,863,000 mt, including 4,799,000 mt of cattle feed, 1,494,000 mt of pig feed and 6,239,000 mt of poultry feed<sup>302</sup>. While there are many compound feed manufacturers located throughout the UK supplying into strongly overlapping regions<sup>303</sup>, there are just two national feed companies, BOCM PAULS and AB Agri, that manufacture and distribute compound livestock feeds on a nation-wide basis. BOCM Pauls operates across the product spectrum (cattle, sheep, pigs and poultry) while AB Agri produces only monogastric feeds (pigs and poultry).

<sup>xxvii</sup> In 2009, the UK feed manufacturing industry produced 13,863,000 mt, of which an estimated 1.1 % was palm oil.

<sup>xxviii</sup> This has been estimated based on the known volumes of PFAD subtracted from the total estimate of palm oil (including both CPO and PFAD, see footnote above).

<sup>xxix</sup> This has been estimated by subtracting the known PKM volumes used for energy generation from the total PKM imports, and cross-checked with a calculation taking the average recommended content for cattle and sheep feed (12.5%) and the average for pig feed (2%) and poultry (0%) as set out in Table 7.1, assuming a 98% meal content and using the 2009 feed industry production figures. The calculation using the reported use for energy production was lower by around 44,000 mt. The lower estimate was used.

BOCM PAULS have 16 animal feed mills across the UK<sup>304</sup> and produce more than two million tonnes of cattle, pig and poultry feed every year<sup>305</sup>. It is estimated that they have a market share of 22 – 23%<sup>306</sup>. They also produce pet food.

AB Agri is owned by Associated British Foods plc, and produces around 2 million tonnes of monogastric compound feed per year<sup>307</sup>. AB Agri UK brands include ABN, Delta XP, and Sportsman Game Feeds<sup>308</sup>. It is estimated that AB Agri has a market share of 20% of all monogastric feed, including compound and straights, and 35 – 45% of compound pig feed, 50 – 60% of poultry and 35–45% of compound game feed markets<sup>309</sup>. Associated British Foods, owner of AB Agri, is a member of the RSPO. In 2010, ABF introduced a group-wide commitment that all of their businesses would use only Certified Sustainable palm oil, or Identity Preserved palm oil, by 2015, provided that supply is available. It is not clear whether this applies to feed.

The remaining industry is made up of country compounders and co-operative and farmer-controlled compounders. Country compounders, while not manufacturing and distributing on a national basis, still have significant manufacturing capacity, in particular, regions or areas of the UK, notably in the northwest. These companies generally operate a single mill and are often long-established organisations based on flour milling or the supply of agricultural requisites. Country or independent compounders are in many cases family-owned. Co-operative and Farmer-controlled Compounders also operate in the UK compound feed industry, though they tend to have substantial interests outside compounding, notably in retailing<sup>310</sup>.

Unitriton, a subsidiary of BOCM PAULS, used to have the only palm kernel crushing facility in the UK, however, they no longer undertake this activity<sup>311</sup>.

ED&Fman is a particularly important commodity trader for the UK feed industry<sup>312</sup>.

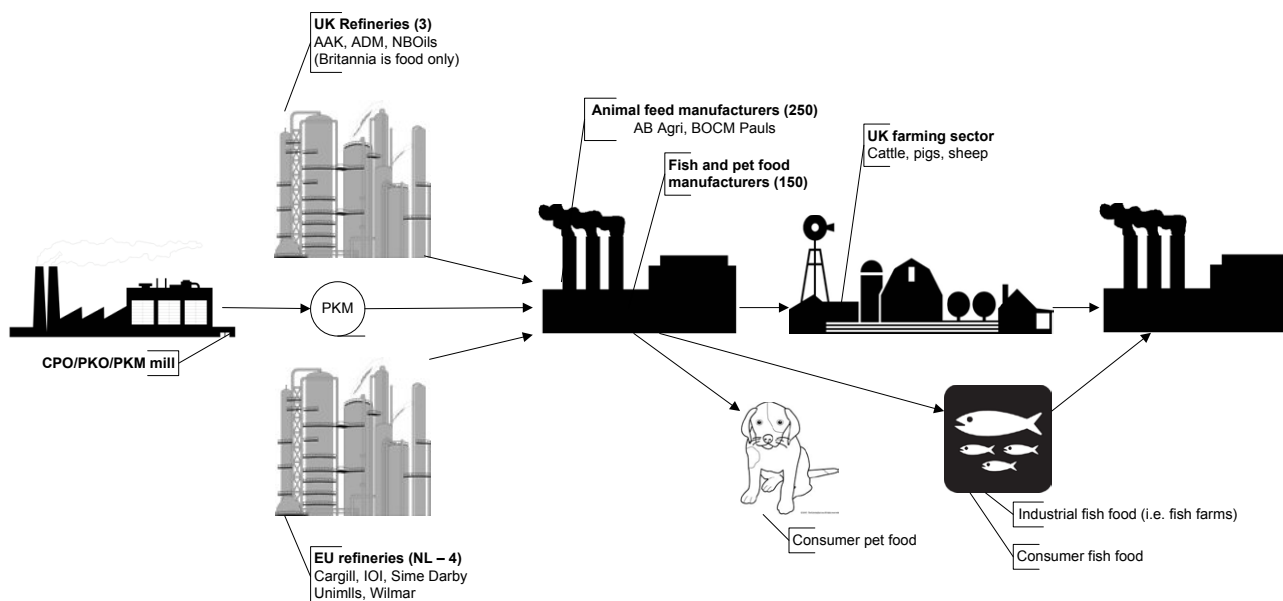


Figure 7.1: Structure of the UK feed industry, including key players



## 8. Use of palm in energy

### 8.1 Electricity generation



(Image source: Ben Sutherland\_cc flickr)

Electricity Generation	
Types of products:	Electricity
Estimated UK volumes:	Electricity: 1000 mt PFAD, 111,000 mt PKM. 22,000 mt PKM was reported as RSPO.
Palm component:	Electricity: PFAD, PKM.
Key players:	RWE nPower, Scottish and Southern Energy, Trostrey Generating Station, W4B.
Implications for policy development:	<p>There is currently limited use of palm oil used for electricity generation, and while a significant portion of the UK's import of PKM is used, there are only three operators involved. However, there is the potential for many more to use palm products, depending on the market conditions and price of alternate feedstocks. The energy sector is already well covered by two pieces of legislation, both related to the EU Renewable Energy Directive (Directive 2009/28/EC), which includes the Renewables Obligation (electricity and heat). This includes reporting requirements and mandatory sustainability requirements. Development of policy options needs to ensure that these existing approaches are taken into account. It is possible that PFAD may be classified as a residue, which would mean the sustainability provisions would not apply.</p>

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### 8.1.1 Background

Electricity can be generated through a number of means, including firing plants, steam stations, nuclear power plants, wind turbines, and hydro electric dams, for example. All these methods involve the same mechanisms, namely the activation of a turbine and alternator to generate electricity.

In firing plants, the combustion of materials (coal, fuel oil, nuclear, gas, solid biomass and liquid biomass) is used to heat up a boiler. The steam produced spins the turbine, which in turn engages with the alternator. The alternator produces electricity which is then transferred then onto the National Grid.

In the UK, renewable fuels such as palm products can be used in firing plants in three different ways:

- Used in existing power plants and co-fired with coal. Co-firing can be direct or indirect<sup>313</sup>. Direct co-firing involves mixing of combustible fuels in the main boiler, whereas indirect co-firing involves injecting biomass and coal separately into the boiler. Coal power plants can mix up to 10-15% of biomass with the main fuel without significantly affecting efficiency of energy production and with little or no equipment changes required.
- Used in fired power plants which have been converted to use renewable fuels (solid or liquid biomass). To convert oil-fired or coal-fired plants to operate using solid or liquid biomass only would require upgrading the boilers<sup>314</sup>.
- Used in purpose-built, dedicated solid or liquid biomass power stations. A number of projects to build such power stations have been proposed in the UK, totalling 200MW of capacity in planned and accepted projects, but none are currently operational.

In CHP (combined heat and power) plants, heat is produced alongside electricity. The heat is created using the same burning techniques as for electricity. Some heated water is used for electricity generation (steam) whereas the rest is used for heating (hot water). Large scale heating systems, as opposed to individual heating systems, are only used at a district scale, as transporting heated water over long distances results in significant energy losses.

Fuel for energy production can be solid (biomass) and liquid (bioliquids). Biomass<sup>315</sup> used for electricity generation can include wood chips, pellets, agricultural residues, Palm Kernel Meal (PKM – also called Palm Kernel Expeller or PKE), sawmill residues, dried sewage sludge, tallow, meat and bone meal, animal manure, residues from the paper and food industries, green waste, coppice, grasses such as *Miscanthus*, sugar crops or starch crops.

Bioliquids used for electricity generation include energy crops such as oilseed rape, soy, palm oil, jatropha, sunflower oil, sugarcane ethanol, tall oil (a product of wood pulping), olive residues and waste oils (used cooking oil collected from foodservice outlets).

Palm products used for energy generation are primarily residuals such as Palm Kernel and Palm Kernel Expeller (PKE) and Empty Fruit Bunches (EFB). About 45 % of the palm fruit is residual material, consisting of shells, kernels, fruit bunches and fibrous materials<sup>316</sup>.

Type of palm	Applications	Trade aspects
<b>Palm Kernel Expeller (PKE)</b>	Used for energy generation and co-firing with coal.	Imported mainly for animal feed.
<b>Crude Palm Oil (CPO)</b>	Crude Palm Oil is being used for energy generation.	Traded in commodity markets.
<b>Palm stearin</b>	Palm Stearin can be used for energy generation (high melting point).	Less expensive than CPO. CIF and FOB markets. Import Duties
<b>Palm fatty acid distillate (PFAD)</b>	PFAD is the cheapest vegetable oil per GJ. High acidity causing corrosion. Potential for co-firing.	Less expensive than CPO. Available in the commodity market.
<b>Palm shells</b>	Normally used for local energy generation at the mill. In some cases shells are being traded.	By-product. Available in the commodity market.
<b>Palm fibers</b>	Used for local energy generation (at the mill)	By-product. Not available in the commodity market.
<b>Empty Fruit Bunches (EFB)</b>	Normally not used. Potential for local energy generation (subject to connection to the grid)	Waste product available at the mills.

Table 8.1: Uses of palm products for electricity generation (Source: IEA Bioenergy Task 40 Seminar<sup>317</sup>)



Figure 8.1: Boiler in a palm oil mill, using processing residues



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These residuals are often used at the palm plantation itself for heat and power generation, as well as in the domestic market and for export. In Indonesia and Malaysia combined, an estimated 20 million mt of palm residuals were produced in 2005<sup>xxx</sup>. This represents a potential of approximately 340,000 MJ, or almost 100,000 kWh (0.1gWh).

To a lesser extent, crude palm oil (CPO), PFAD and its direct fractions (stearin and olein) are also used in energy generation, especially as ignition fuels in PF (pulverised fuel) plants. It is reported that palm oil stearin (the heavier fraction from processing of crude palm oil) can result in greenhouse gas emissions savings of around 25-50 % compared to the generation of electricity in a natural gas-fired power station, and using crude palm oil can result in emissions savings of 0-35%<sup>318</sup>.

### 8.1.2 Volumes of palm used for electricity generation

In 2009, 371,978 GWh was generated in the UK; the majority of electricity which was produced using gas (46%), coal (31%) and nuclear (13%)<sup>319</sup>. Around 6.6% of the electricity from licensed suppliers was generated from renewables eligible under the Renewables Obligation (RO)<sup>320</sup>. Approximately 75% of the renewables used for electricity generation was biomass, of which around 10% was derived from plant biomass<sup>321</sup>.

A total of 111,000 mt of PKM was reportedly used by UK electricity generators in 2009/10, including at RWE nPower's Aberthaw fired power station (reported 22,000 mt), RWE npower's Didcot fired power station (reported 15,000 mt PKM) and Scottish and Southern Energy's Fiddler's Ferry fired power station (reported 74,000 mt PKM)<sup>322</sup>. This is equivalent to approximately 17% of the UK import of PKM. Only Aberthaw reported RSPO for the PKM used<sup>323</sup>. A further 900 mt of PFAD was reported by Trostrey generating station<sup>324</sup>. This is down from 2005 figures, where it was estimated that over 30% (by mass) of the co-firing feedstock for UK coal-fired power stations was derived from palm products (449, 657 mt out of 1,412,122 mt total biomass used for co-firing<sup>325</sup>). In 2006 it was estimated that palm products (including CPO, PKM and PKS) were being used in the range of 20,000 – 50,000 mt/month (240,000 – 600,000 mt per year)<sup>326</sup>.

If the six bioliquid projects currently approved for construction in the UK used only palm oil (which in practice they are unlikely to, and choice of materials will depend on price and availability), it is estimated that the total demand would be 576,800 L/day or 210,532,000 L/year. This maximum estimate is equivalent to 210,000 mt CPO/year<sup>xxxi</sup>. Furthermore, if all existing power plants were to increase the percentage of biomass used in their installations to 15% (the threshold after which modification to the plant would be required), it would create a demand for solid biomass of around seven million mt, of which PKM could be a significant component.

### 8.1.3 UK electricity generation sector

Sustainability of palm biomass in the UK electricity generation sector is linked to company corporate social responsibility policies as well as to the UK Government's Renewables Obligation. Companies interviewed stated that, to their knowledge, little RSPO certified material was available for use in the energy sector with most segregated volumes being purchased by the food and personal care sectors, contrary to data which suggests that there is currently a surplus of supply for RSPO certified palm oil. Concerns were also raised that using certified segregated RSPO palm oil for energy generation would compromise the supplies to the food and personal care sectors and drive up prices of certified RSPO palm oil<sup>327</sup>.

<sup>xxxi</sup> This is based on an output of 28 million metric tonnes of palm oil (Woods *et al.*, 2006)

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In the United Kingdom, there are approximately 100 electricity licensees for electricity generation nationally<sup>328</sup>. The UK National Grid is a high voltage transmission network in the UK, which connects large electricity producers to the electricity distribution operators<sup>329 330 331</sup>. The Scottish grid is owned by Scottish Power and Scottish and Southern Energy. The National Grid is run by the transmission system operator who monitors fluxes of energy and directly liaises with electricity producers to ensure enough energy is produced, on a regular basis (hourly/daily/weekly/monthly/yearly). Electricity producers need to pay a 'transport fee' to the National Grid to be able to use it. The electricity is then transported to electric distribution substations and their operators for domestic distribution. There are currently 10 ten distribution network operators in the UK<sup>332</sup>.

The first power plants to use co-firing with biomass (mainly wood products and residues) were Slough Heat and Power, Longannet and Ferrybridge. Ferrybridge uses a variety of co-firing fuels, and have used PKM in the past<sup>333</sup>.

Around 30 power plants currently co-fire with bioliquids, totalling more than 14,300 MW<sup>334</sup>. Three of companies have declared the using of palm to Ofgem (around 4,300MW). There are no known plants in the UK that have been converted to run on 100% bioliquids.

RWE nPower have an extensive programme of biomass co-firing in its fossil-fuel power stations, including the use of palm oil<sup>335</sup>. In 2009, they used 123,477 mt of biomass, of which 37,000 mt was PKM<sup>336</sup>. They are an RSPO member<sup>337</sup>, and recently took the decision not to convert its oil-fired plant in Littlebrook, Dartford to 100% palm oil on the basis that insufficient volumes of sustainably sourced palm oil were available to make the conversion economically viable<sup>338</sup>.

E.ON UK has stated that they will 'always seek to ensure that all biomass is purchased from a sustainable and socially responsible source'<sup>339</sup>. However, they have indicated they are not currently using palm oil for co-firing<sup>340</sup>.

The first dedicated biomass power plant in the UK to be given planning permission was a BlueNG<sup>xxxii</sup> 19.5 MW plant in Beckton, East London, which, once operational, would use 56,000 L of vegetable oil a day. It is planned as a dedicated vegetable oil CHP plant in and is the first of 8 eight such plants planned for the UK by BlueNG. The planning application was subject to numerous protests, particularly with respect to the potential use of palm oil as a feedstock, as well as other vegetable oils. Although BlueNG have stated they do not intend to use palm oil as a feedstock<sup>341</sup>, some grassroots organisations are not satisfied that they have not ruled out palm oil<sup>342 343</sup>. (though Greenpeace has endorsed the project<sup>344 xxxiii</sup>).

The energy company W4B has been given permission to build a 17.8MW plant at Portland in Dorset to burn palm stearin as well as jatropha<sup>345</sup>. A second W4B has also been given planning permission in Bristol on the basis that all the fuel will be subject to the Renewable Order sustainability criteria<sup>xxxiv</sup>. W4B is an RSPO member. They have stated they are currently identifying supplies of sustainable palm stearin for their planned plant in Dorset<sup>346</sup>.

<sup>xxxii</sup> BlueNG is a joint venture between the National Grid and 2OC, however, in September 2010 it was announced under EU rules that NG could not own a generating business. 2OC is continuing to seek financing for the plant.

<sup>xxxiii</sup> John Sauven, Director of Greenpeace UK said: "Blue-NG has made a clear commitment to sustainable practice and councillors deserve praise for including an agreement which holds them to that. This is a beacon project for other decentralised renewable generators which will help to meet electricity demands in a demonstrably sustainable way."

<sup>xxxiv</sup> The initial application was rejected, in part because of concerns about the wider impacts of the biofuels and specifically the use of palm oil. It was later approved on appeal.

Solent Sustainable Energy Ltd. was a not-for-profit company that was set up by Millbrook council in 2005 to develop a CHP district heating project with a capacity of 50MWe from combusting palm oil. The plant was designed to supply heating and hot water to 3,440 council houses as well as other public and private properties in the area<sup>347,348,349,350</sup>. The project never went ahead as it was considered too costly and very likely to have difficulties with the supply of palm oil.

BEI Teesside has a planned capacity of 49.3 MW. It was granted planning permission in March 2010<sup>351</sup>. They have stated that Palm Kernel Shells will be used as the primary feedstock<sup>352</sup>.

Drax, the UK's biggest power station, is to convert one of its coal-fired boilers to use biomass. This would be the first time that any leading power station had taken an existing coal-fired turbine and converted it to be biomass-only. However, they have stated that their sustainability policy would rule out using palm oil<sup>353</sup>.

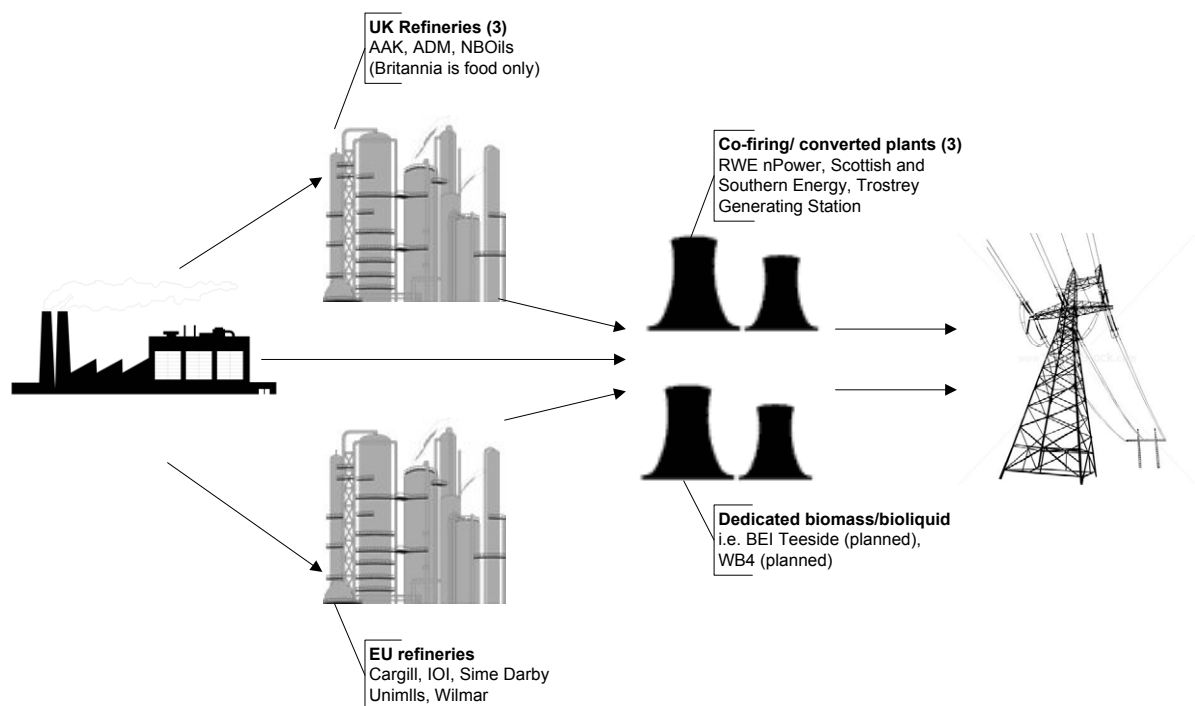


Figure 8.2: Structure of the UK energy supply chain, with key players

#### 8.1.4 UK legislation for sustainability of electricity generation

DECC (Department of Energy and Climate Change) was created in 2008 to bring together energy policy and climate change mitigation policy. The UK's Renewable Energy Strategy sets out how UK use of renewable energy can be increased to help tackle climate change and help secure future energy supplies. The UK target is to source 15% of its energy (electricity, heat and transport) from renewable sources by 2020<sup>354</sup>.

The Office for Renewable Energy Deployment (ORED)'s role is to ensure renewable energy targets are met<sup>355</sup>. Currently, the main financial incentive is the Renewables Obligation (RO). There is also the Feed in Tariff<sup>356</sup> and the Renewable Heat Incentive<sup>318</sup>, both designed to incentivise small scale generation of electricity from renewables, for example by households and businesses.

Under the RO, Renewables Obligation Certificates (ROCs) are issued to RO accredited generators for eligible renewable electricity generated in the UK for UK customers. These can be sold to electricity suppliers in the UK. Under the Renewables Obligation Order, electricity suppliers need to source an increasing amount of their electricity from renewable sources. In 2010/2011, it should account of 11.1% of total electricity supplied. Failure to do so results in a fee-paying fine equivalent to the amount of ROCs missing.

ROCs available for biomass and energy crops used in energy generation is summarised in Table 8.2. The weighting of the ROCs is designed to reward energy suppliers using higher levels of biomass, which may increase the volumes of palm biomass used.

Generation type	ROCs/mWh
Co-firing of biomass	0.5
Co-firing if energy crops	1
Co-firing of biomass with CHP	1
Co-firing of energy crops with CHP	1.5
Dedicated biomass	1.5
Dedicated energy crops	2
Dedicated biomass with CHP	2
Dedicated energy crops with CHP	2

Table 8.2: ROC banding (2010) <sup>358</sup>

As of April 1, 2011, mandatory sustainability standards for biomass used in electricity generation apply. There is a transition period of mandatory reporting against the criteria from April 2011, with eligibility for ROCs from April 2013. The requirements are as per the Renewable Energy Directive (Directive 2009/28/EC), including a minimum 60% greenhouse gas emission saving for electricity generation using solid biomass or biogas relative to fossil fuel; and, secondly, general restrictions on using materials sourced from land with high biodiversity value or high carbon stock<sup>359</sup>. However, it has been suggested that PFAD would qualify as a waste, which would mean that they would not be subject to the sustainability provisions<sup>360</sup>.

As part of this update, biodiesel will now be eligible for ROCs, which may mean an increase in electricity generation from biodiesel<sup>361</sup>.

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## 8.2 Biodiesel

(Image source: Skidrd\_cc flickr)



Biodiesel	
<b>Types of products:</b>	Palm Methyl Ester, Fatty Acid Methyl Ester, Hydrogenated Vegetable Oil
<b>Estimated UK volumes:</b>	100,000 mt (in 2009); 49,000 mt in 2010 (mainly imported as methyl esters or finished fuel). Likely RSPO certified: 28,500 mt, as qualifying standard (2009/10).
<b>Palm component:</b>	Crude Palm Oil, transesterified to PME
<b>Key players:</b>	BP, Chevron, Greenergy, Exxon, Shell and Total. Commodity traders ADM, Cargill, Dreyfus, Wilmar.
<b>Implications for policy development:</b>	Biodiesel is already covered under the Renewable Transport Fuel Obligation, which will be amended or replaced by the EU Renewable Energy Directive. Both the RSPO and the ISCC have applied to the EU for recognition, as well as several other schemes which could also be used for palm oil.

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## 8.2.1 Background

The biofuel component of diesel is called a Fatty Acid Methyl Ester ('FAME'). FAME is manufactured in biodiesel plants using a process called transesterification, which is a catalyzed reaction between refined vegetable oils, refined animal fats, tallow or used cooking oil and methanol. Glycerine is a by-product of this process. The conversion efficiency is approximately 98% from vegetable oil to methyl ester.

Each type of input feedstocks (e.g. palm oil, soy oil, rapeseed oil etc.) has different cold filter plugging points (cfpp), with lower cfpp levels sold at a premium. Palm Methyl Ester (PME) has a cfpp of 15°C, compared to a -4°C cfpp for Soy Methyl Ester (SME) and -14°C for Rapeseed Methyl Ester (RME). Different quantities of the vegetable and/or tallow oil methyl esters are blended depending on the cfpp point desired. The three most commonly used FAME cfpp levels in Europe are: 0, -5 and -10<sup>362</sup>. Because PME has a comparatively high cfpp, it is not normally used in winter fuel blends in the UK because it would solidify and clog the engine<sup>363</sup>.

Biodiesel methyl esters can be produced in the country of origin of the feedstock and shipped to Europe as methyl esters. Alternatively, vegetable oils can be shipped to Europe and made into biodiesel there. Biodiesel produced in Europe may be blended into FAME in Europe or in the UK. Additionally, FAME and diesel may be blended in Europe and imported into the UK as a finished fuel.

Blending different types of FAME to achieve the desired cfpp is undertaken in bulk storage tanks, which may be adjacent to a biodiesel plant or a stand-alone tank farm. FAME is then blended with diesel (currently up to 7% blends) at the oil refinery to produce the finished fuel<sup>364</sup>. During 2009 biodiesel accounted for 4.2% of diesel in the UK<sup>365</sup>.

In order to maximise efficiency of distribution, there is a practice called 'exchanging' which means that competing fuel companies will pick up fuel for delivery from each other's refineries (referred to as an 'exchange') without buying and selling the product. This means that a fossil fuel company is unlikely to know the biofuel content of fossil diesel delivered to their distribution networks and retail sites.

Fuel is legally liable to excise duty when it is loaded to leave the refinery or major import terminal<sup>366</sup>. The mechanism for delivering transport fuel from a refinery, a terminal, or a marine vessel into a railroad tank car, a transport truck or a tank wagon is called the 'rack', which is the duty point.

In the UK, much of the fuel is distributed using underground pipelines, carrying the fuel from the coastal refineries to terminals in the midlands<sup>367</sup>. In addition to the UK oil refineries and pipelines, there is a UK network of independent coastal terminals through which petroleum products made in the UK and overseas can be distributed. These terminals are generally owned by storage companies that rent their tank capacity<sup>368</sup>.

Transport fuel is delivered by trucks, picking up fuel from the terminals or depots and delivering to petrol stations and private and public sector customers.

## 8.2.2 Volumes of palm used for biofuels

Between April 2008 and April 2009, 127,008,760 L of PME was delivered to the UK market, equivalent to 129,548 mt of palm oil<sup>xxxv</sup>.

In the following year, between April 2009 and April 2010, 99,106,066 L of PME was delivered to the UK market, down 22% from the previous year. This was equivalent to 101,088 mt of palm oil<sup>xxxvi</sup>.

<sup>xxxv</sup> Assuming a 98% conversion rate from palm oil to PME

<sup>xxxvi</sup> Ibid

Data is available for April 2010 – October 2010, which indicates that 31,142,298L<sup>xxxvii</sup> of PME (equivalent to 31,765 mt palm oil) has been delivered to the UK market over this time period. This is a 48% decrease compared to the same time period last year, and a 55% decrease compared to the same period in 2008. If the trend continues for the rest of the reporting year (until April 2011), it is estimated that the total volume of PME delivered to the UK market would be around 48,000,000 L (equivalent to approximately 49,000 mt of palm oil).

This decrease is likely due the price of palm oil and the availability of less expensive substitutes such as tallow and used cooking oil<sup>369</sup>. Using used cooking oil (UCO) to produce biodiesel currently benefits from a 0.20p/L excise tax relief<sup>370</sup>. Also, fuel companies have expressed concerns about the reputational risks of using palm oil for fuel (see following section).

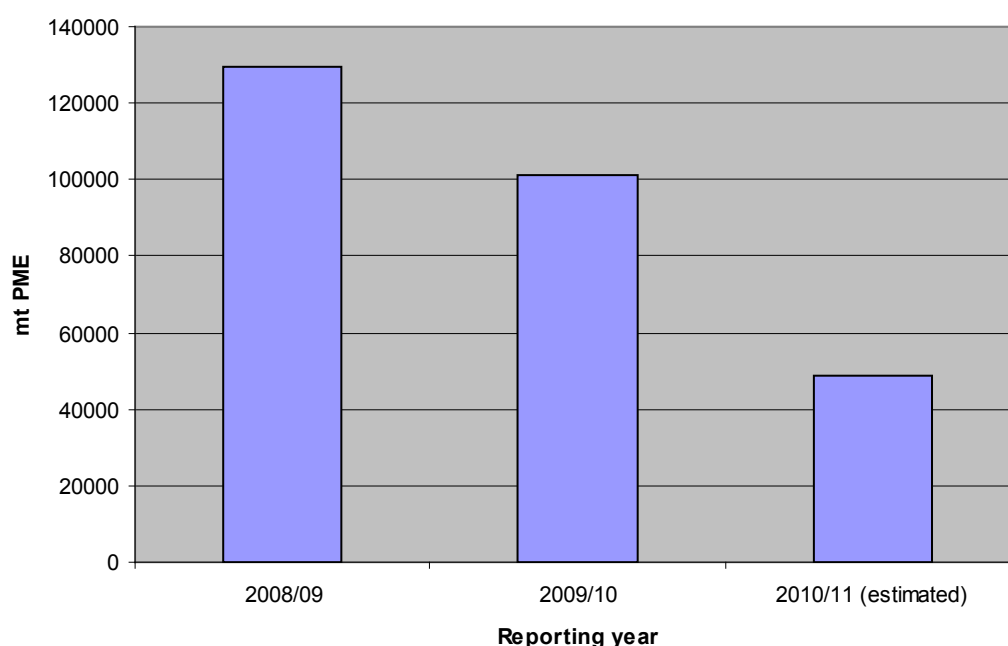


Figure 8.2: Palm Oil equivalent delivered to UK market as PME (Source: RFA)

Companies are obligated to report to the Government the country of origin for the biofuels imported. There has been a strong trend towards being able to identify the origin of the palm feedstocks. The decrease in volume between the 2008/09 and 2009/10 reporting years was all in the ‘unknown’ category. In 2008/09, around 41% of the PME was of unknown origin, with the remaining from Indonesia (18%) and Malaysia (41%). In 2009/10, just 14% was unknown, with 26% of PME from Indonesia 60% from Malaysia<sup>330</sup>. The actual volumes sourced from Indonesia and Malaysia were actually very similar between the two reporting years (23,000,000 L to 26,000,000 L for Indonesia, and 52,000,000 L to 59,000,000 L for Malaysia). The data for the 2010/11 reporting year, up to October 2010, indicated that there were no unknown sources, and 47% was from Indonesia, 46% from Malaysia (both around 14,000,000L) and 7% from India<sup>xxxviii</sup>.

The PME delivered to the UK market is in almost all cases imported into the UK as either PME or FAME (PME as part of a blend with RME and SME), therefore would not be included in the HMRC figures for palm oil imports, nor the volumes previously discussed as imported by UK edible oil refineries.

<sup>xxxvii</sup> Unverified data

<sup>xxxviii</sup> Unverified date



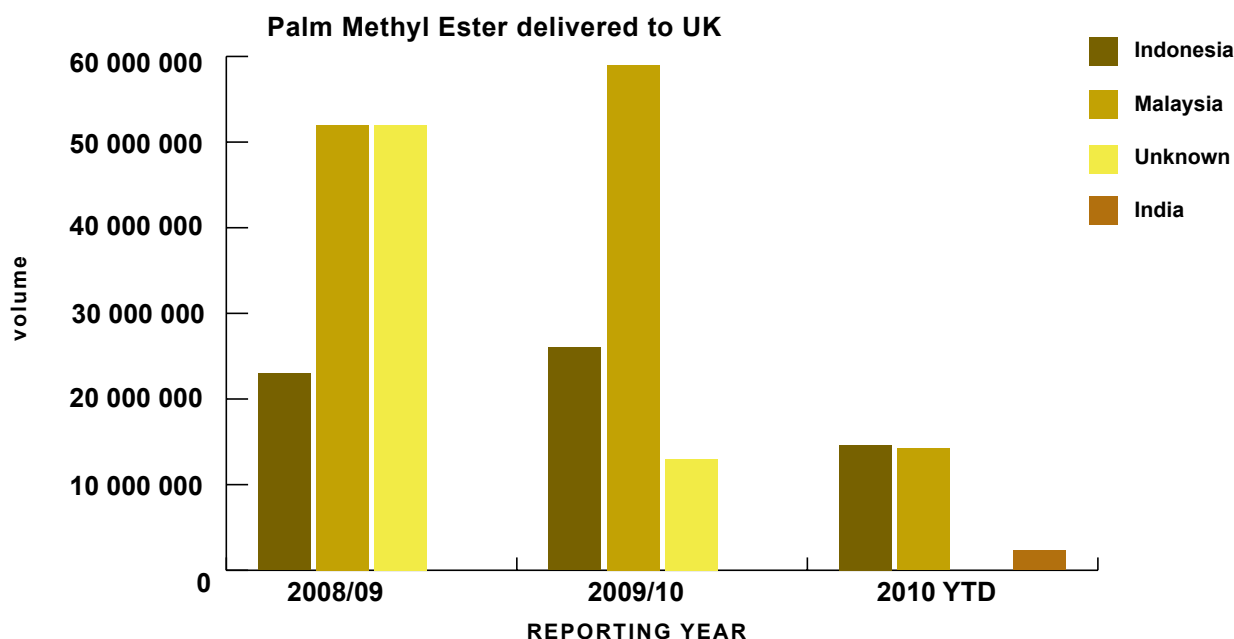


Figure 8.4: Origin of PME used in UK transport fuels (Source: RFA)

### 8.2.3 Sustainability of palm oil in the UK biofuels sector

Biodiesel, including PME, is predominately imported from the Netherlands and Germany, either as a single methyl ester or as a blended FAME.<sup>372</sup> Most of the large fossil fuel companies in the UK have integrated supply chains with storage and blending facilities in the Netherlands. Domestic production of biodiesel in the UK was estimated at 223,000 mt/year in 2009, though actual capacity is higher. The largest biodiesel manufacturers include the Argent plant at Motherwell (capacity: 45,000 mt/year, processing tallow and UCO), the Greenergy plant at Immingham (capacity: 200,000 mt/year, processing mixed feedstocks), the Harvest plant at Teeside (capacity: 250,000 mt/year, mixed feedstocks, including palm oil<sup>373,374</sup>) as well as many smaller producers mainly processing wastes (see Annex B).

UK refineries supply an estimated 85% of the product consumed in the inland market and account for more than 80% of the total storage capacity for crude and products<sup>375</sup>. In the UK there are nine oil refineries), which are blending biodiesel (including PME) on site. There are a further 18 independent storage locations where blending of FAME and blending of FAME with biodiesel takes place<sup>335</sup> (see Figure 8.5).

As of October 2010, there were 16 fossil fuel companies registered as supplying >450,000 L of fuel to the UK market (see Annex B, Table 1), and two of these also have biodiesel plants including Greenergy<sup>377</sup> and Harvest<sup>378</sup>. There are a further 33 companies registered as biofuel producers in the UK. Of these, 30 were processing wastes and by-products, with two processing rapeseed and one processing sugar beet (See Annex B, Table 2). With the possible exception of Harvest<sup>xlii</sup>, UK biodiesel plants are not known to be currently processing palm.

Palm oil and PME is sourced from ADM, Bunge, Cargill and Dreyfus, the world's four largest commodity trading houses<sup>379</sup>, as well as smaller traders. Wilmar is also a significant importer into Europe, shipping both PME and palm oil into Rotterdam<sup>380</sup>.

<sup>xlii</sup> Harvest has previously stated publicly that palm made up 2% of their feedstock mix, however, it is also possible that they are not currently processing palm oil

Location	Company	Refining capacity (million tonnes pa)
Grangemouth, Scotland	INEOS <sup>xxxiii</sup>	>10
Killingholme, Lincolnshire	TOTAL	11
Humber, Lincolnshire	Conoco	11.5
Croyton, Thames	Petroplus	10
Fawley, near Southampton	Esso	16
Pembroke, South Wales	Chevron Texaco <sup>xxxiv</sup>	10.5
Milford Haven, South Wales	Murco	6
Stanlow, Cheshire	Shell <sup>xxxv</sup>	12

#### STORAGE INFRASTRUCTURE - INDEPENDENT

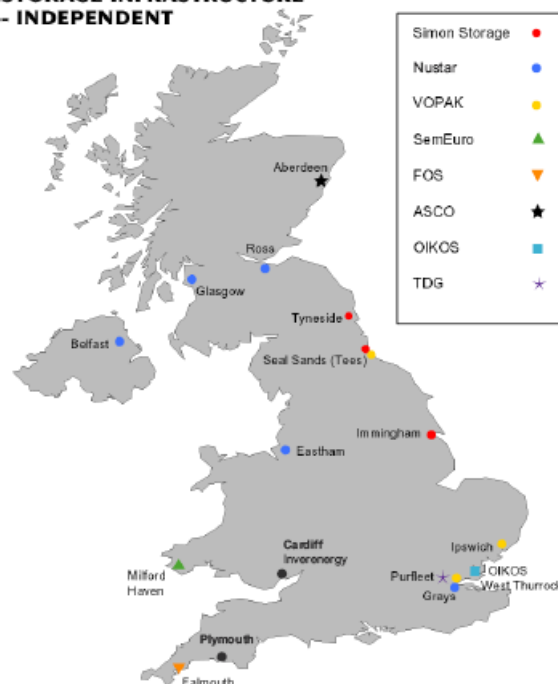


Figure 8.5: UK Refineries and storage infrastructure  
(Source: Greenenergy)

In the UK, sustainability of biodiesel feedstocks is driven by legislation, as well as commitments made by oil companies related to these legislative requirements, risk management and company corporate social responsibility policies. Some oil companies indicated they have set up long term supply agreements for palm oil, where they have worked with the suppliers to identify the plantations from which the palm oil originated<sup>381</sup>. This trend is supported by the data reported by the RFA, which shows a marked decrease in the volumes of PME from unknown origin reported (Figure 8.4).

Four of the 16 Obligated Companies have publicly taken steps to address the sustainability of their palm feedstocks:

BP is a member of the RSPO<sup>382</sup>. To date, they have purchased 669 GreenPalm certificates in 2008 and 640 in 2009<sup>383</sup>.

Chevron has stated that 'As sustainable palm oil certification systems become commercially operational, Chevron will progress towards sourcing, supplying and trading only certified palm oil'<sup>384</sup>.

Greenenergy is an RSPO member<sup>385</sup>. They have publicly stated that they will only buy palm oil if it can be traced back to well managed plantations where there has been no recent land use change, whether rainforest or peatland destruction<sup>386</sup>. To date, they have purchased 3,400 GreenPalm certificates in 2009 and 150 in 2010<sup>387</sup>.

Shell is an RSPO member, and participates in the GHG working group, the EU RED Working group and the Biofuels WG. As part of their contract sustainability clauses, they require any supplier that wishes to supply palm oil to Shell to join the RSPO and comply with its principles and standards. Currently Shell is engaged with suppliers to purchase RSPO certified palm on a mass balance system using the UTZ traceability mechanisms, and has been involved in the development of the Thailand RSPO National Interpretation<sup>388</sup>. They report that 82% of their suppliers worldwide (for all types of biofuels) have signed up to sustainability contract clauses<sup>389</sup>. Shell has stated that they did not use

<sup>xxxiii</sup> Reportedly negotiating a 50% JV sale to PetroChina

<sup>xxxiv</sup> Reportedly negotiating sale with Valero

<sup>xxxv</sup> Reportedly negotiating sale with Essar (India)

palm oil in UK during the 2008/09 reporting year because sustainable sources were not available, and all subsequent palm oil delivered to the UK market was RSPO certified<sup>390</sup>. Shell Trading Rotterdam purchased 5,320 GreenPalm certificates in 2009<sup>391</sup>.

None of the other 12 obligated companies are known to have made public statements or policy commitments about the sustainability of palm oil used in biodiesel, nor have they purchased GreenPalm certificates.

While not an Obligated Company in the UK, a case study on Neste Oil has also been included below, as they are a significant user of palm oil, and have actively sought to secure sustainable sources. They have recently opened the world's largest biodiesel plant in Rotterdam, adjacent to the IOI Loders-Croklaan refinery<sup>392</sup>.

### Neste Oil Case Study

In its sustainability policy statement, Neste Oil commits itself to providing customers with products that help tackle to sustainability issues, such as global climate change, and to improve local air quality. Today, palm oil is one of the renewable raw materials that the company uses for its biofuel product. Neste Oil used a total of 0.6% of the palm oil produced worldwide in 2009 through manufacturing its premium quality Hydrogenated Vegetable Oil (HVO)–type NExBTL renewable diesel. Neste Oil also uses rapeseed oil and waste animal fats from the food industry, alongside palm oil, and new potential raw material sources are being investigated and developed.

In 2006, Neste Oil was the first oil company to become a member of the Roundtable for Sustainable Palm Oil (RSPO). Currently, Neste Oil is one of the largest users of certified palm oil in the world. In order to comply with the European Renewable Energy Directive (RED), all of the raw materials used have to be fully traceable. That is why the company has been using long term agreements with its suppliers and favours UTZ certified palm oil. Neste Oil received its first cargo shipment of certified palm oil at Porvoo, Finland in April 2009, and has set itself the target of using solely certified palm oil by the end of 2015. Annual figures of certified volumes are reported on the RSPO's website at [www.rspo.org](http://www.rspo.org).

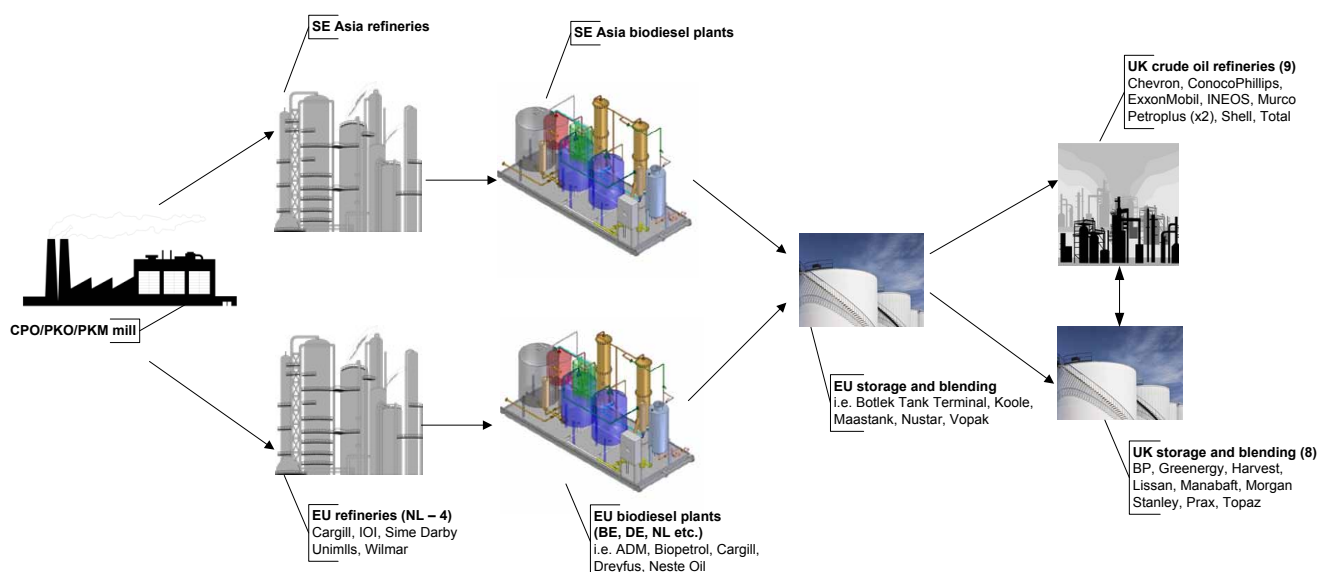


Figure 8.6. Structure of the UK biofuel supply chain, including key players

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#### 8.2.4 UK legislation for sustainability of biofuels

The EU Directive 2003/30 set out a volume target of 5.75% for use of biofuels, which was transposed into UK legislation as the Renewable Transport Fuel Obligation. In addition to the volume requirement, sustainability requirements termed the 'RTFO meta-standard' were developed, and voluntary targets set out for compliance with the meta-standard. The RTFO meta-standard includes requirements on social and environmental impacts of production.

A number of existing sustainability standards were benchmarked against the RTFO meta-standard, including the RSPO.

Companies supplying biofuel into the UK market are required to report the type of feedstock (e.g. palm), the country of origin, land use prior to November 2003, compliance with the RTFO meta-standard (for example, as demonstrated through RSPO certification), carbon data (either using a default figure provided by the RFA or calculated using actual values). Companies are allowed to report 'unknown'.

Voluntary targets were set for sustainability, including 30% in 2008/09, 50% in 2009/10 and 80% in 2010/11<sup>393</sup>.

In the 2008/09 reporting year, 461,776 L of PME was reported as meeting a social and environmental standard, equivalent to 0.3% of the PME import. In the following reporting year (2009/10), this rose to 28% (27,886,957 L of PME, equivalent to around 28,500 mt of palm oil)<sup>394</sup>. For data up to October 2010, this had increased to 38% of the total PME, equivalent to just over 12,000 mt of palm oil.

The RTFO will be amended or replaced to incorporate the requirements of EU Directive 2009/28/EC, known as the Renewable Energy Directive. These mandatory requirements cover land use change after January 2008 and minimum Greenhouse Gas (GHG) savings. Biofuels must meet these requirements in order to count towards national targets and be eligible for financial support. Additionally, reporting requirements on soil, air and water as well as some social issues such as land rights, food security and labour, though additional guidance on how reporting will be implemented is not yet available.

The EU RED allows mass balance chain of custody systems, but currently does not allow book and claim systems such as GreenPalm.

The RSPO is currently developing voluntary actions for GHG savings, and in the interim is seeking approval from DG Energy as a voluntary scheme under the EU RED on the basis that a grandfathering clause in the Directive exempts installations that were in operations before January 2008 from the minimum 35% GHG savings, until April 2013<sup>395</sup>.

# 9. Use of palm in cleaning products

## 9.1 Cleaning products



(Image source: Fatesnowfox\_cc flickr)

Cleaning products	
Types of products:	Laundry and dishwashing
Estimated UK volumes:	23,000 mt palm kernel oil equivalent. No known RSPO.
Palm component:	Palm Kernel Oil derivatives (surfactants)
Key players:	P&G, Reckitt Benckiser, Robert Mc Bride, SC Johnson and Unilever
Implications for policy development:	Major buyers of oleochemicals do not normally have information about the feedstock origin of the chemicals. Some major industry players have begun working with their manufacturers and suppliers to identify the sources and encourage sustainable and responsible production and procurement practices.

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### 9.1.1 Background

Cleansing surfactants, also known as primary detergents, are wetting agents that lower the surface tension of a liquid, and surround and trap oily materials from surfaces<sup>396</sup>.

Almost all cleaning and household products contain surfactants. This includes laundry, dishwashing, toilet cleaners and air care products<sup>397</sup>. Surfactants<sup>xliii</sup> can be made from both petrochemical (derived from crude oil) and oleochemical (derived from agriculture) sources. Surfactant agricultural crop feedstocks include palm, palm kernel oil and coconut oil. Both oleochemical and petrochemical surfactants are normally used together in detergent formulations<sup>398</sup>. Palm oil derived surfactants make up a significant proportion of the UK's use of surfactants<sup>399</sup>.

To make surfactants from palm oil and PKO, methyl esters are fractionated into alcohols, (which are used to make alcohol ethoxylates, alcohol sulfates and alkyl polyglucosides), and fatty acids (which are used to make alcohol ethoxy sulphates and soap). Cationic surfactants (such as esterquat) are used in fabric softener. They also have a function on household and bathroom cleaners in disinfecting and sanitizing<sup>400</sup>.

The global surfactant market is around 9 million mt, of which linear alkylbenzene sulfonate (LAS) is the biggest individual product<sup>401</sup>, which is widely used in detergents. Methyl ester sulfonates (MES) are considered as a 'green' alternative to petroleum-based LAS. MES is a product of the biodiesel manufacturing process (a methyl ester fraction), which means as PME production increases, so does the availability of the oleochemical feedstock. Furthermore, increases in fossil oil costs have made LAS less attractive<sup>402</sup>. Japan-based Lion and US-based Sun Products have historically been the main producers of MES, however global capacity is reportedly increasing in Southeast Asia and South America, estimated around 150,000 mt/year<sup>403, 404</sup>.

### 9.1.2 Volumes of palm used for cleaning products

There has been a shift towards use of oleochemical derived feedstocks in the past five years (as opposed to petrochemical), as a result of more plants being built in Southeast Asia with access to palm feedstocks<sup>405</sup>. In 2006 it was estimated that 460,000 mt (20%) of the 2,300,000 mt European surfactant market was derived from oleochemicals (rather than petrochemicals), dominated by palm oil and palm kernel oil from SE Asia<sup>406</sup>. The NFCC estimated in 2010 the European surfactant market could be made up of more than 40% oleochemicals<sup>407</sup>. On average, around 1 mt of PKO is needed to produce 2 mt of surfactants<sup>408 xliiv</sup>.

Household detergents consume almost half of the global surfactant production<sup>409</sup>, of which and estimated 80% is laundry detergents, 10% dishwashing detergents, and 7% fabric softeners. It is estimated on average 30% by volume of detergent, cleaning and maintenance products are surfactants. Oleo alcohols are thought to account for almost 70% of the global detergent market<sup>410</sup>.

The UK consumes around 20% of Europe's surfactants, which is equivalent to an estimated 23,000 mt of palm kernel and coconut oil used in cleaning and household products<sup>xliv</sup>, likely 18,400 mt in laundry detergents, 2,300 mt in dishwashing detergents and 1,600 fabric softners<sup>411</sup>. While it is not possible to disaggregate the palm kernel from the coconut precisely, it has been suggested that most of this is likely to be derived from palm kernel oil in the UK<sup>412</sup>.

<sup>xliii</sup> Surface active agent

<sup>xliv</sup> In Germany, it was estimated in 2006 that PKO derived surfactants were 30% of Alcohol Sulphates (9,000 mt surfactant, 6,200 mt PKO), 20% of Alcohol Ether Sulphates (16,000 mt surfactant, 7,900 mt PKO), 30% of Alcohol Ethoxylate AE<sub>3</sub> (28,000 mt surfactant, 16,600 mt PKO) and 30% of alkyl polyglucosides (6,000 mt surfactant, 2,700 mt PKO). Alcohol Ethoxylate AE<sub>3</sub> was 40% palm oil (94,000 mt surfactant, 38,800 mt palm oil).

<sup>xlv</sup> This estimate uses the 460,000 mt European market oleochemicals as the starting point, assumes 20% consumed by the UK, that 50% is used in cleaning and household products and that 1 mt of oil is used to produce 2 mt of surfactant.

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### 9.1.3 UK cleaning products sector

The UK cleaning products industry has annual sales of around £3 billion of which £700 million is attributable to the professional, industrial and institutional sector per year<sup>413</sup>. The main UK manufacturers of cleaning and household products include P&G, Reckitt Benckiser, Robert Mc Bride, SC Johnson and Unilever, most of which are RSPO members.

P&G has production facilities in London, Manchester and Seaton Delaval (Northumberland)<sup>414</sup>. Their cleaning and household brands include Fairy, Febreeze, Flash, Viakal, Vortex, Ace, Ariel, Bold, Daz, Dreft and Lenor<sup>415</sup>. P&G has a 50:50 joint venture with Felda Palm Industries called FPG Oleochemicals, which includes a glycerine refinery and oleochemical manufacturing facility<sup>416</sup>. Felda Palm Industries is Malaysia's largest miller, with 70 CPO mills nationwide<sup>417</sup>. P&G has a public commitment to obtain all of its palm oil based raw materials from responsible and sustainable sources by 2015.

Reckitt Benckiser cleaning and household product brands include Air Wick, Cillit Bang, Codis, Dettol, Finish, Harpic, Mr Sheen, Vanish, Woolite and Windolene<sup>418</sup>. They have four UK manufacturing sites, including a specialised aerosol and high volume liquid plant for their household business in Derby<sup>419</sup>. They are a member of RSPO.

Robert McBride manufactures private label cleaning and household products as well as brands including Surcare, Clean and Fresh, i-clean, Sensei and Limelight. McBride has six factories in the UK, 11 factories in Western Europe and one in both Poland and China<sup>420</sup>. They manufacture a laundry liquid called Planet Clean, which is reportedly made from 'sustainable palm oil'<sup>421</sup>.

SC Johnson manufactures Oust, Glade, Pledge, Duck, Raid, Mr. Muscle, Autan, Goddard's, and Shout<sup>422</sup>. Their air fresheners and toilet cleaners are produced at a facility in Frimley Green, Surrey<sup>423</sup>.

Unilever cleaning and household brands include Cif, Comfort, Domestos, Persil, Sun and Surf<sup>424</sup>. These are produced at the Port Sunlight Site in Merseyside, which is also a European centre for R&D and Home & Personal Care Products<sup>425</sup>. Unilever are members of RSPO and lead the RSPO derivatives working group.

While not currently operating in the UK cleaning sector, a case study on Henkel is provided below, as they have taken steps to address the sustainability of the palm kernel oil derivatives used in their cleaning products.

#### Henkl Case Study

Henkel were the first company worldwide to purchase GreenPalm certificates for RSPO palm kernel oil in 2008, and have committed to using sustainable palm oil and palm kernel oil by 2015. The palm kernel oil and palm oil that Henkel utilizes indirectly through its suppliers of surfactants or other raw materials account for less than 0.2 percent of the world total, and they estimated that around 35% of the surfactants used in their laundry detergents and household cleaners are derived from palm kernel oil and coconut oil. (Source: Henkl ([www. http://www.henkel.com/](http://www.henkel.com/)))



The major UK surfactant manufacturers include Croda, Saudi Basic Industries Corporation (SABIC) and Stepan.

Croda has a manufacturing facility at Rawcliffe Bridge, Goole where it manufactures more than 200 products, most of which in volumes <500 mt/year<sup>426</sup>. Croda closed its Wilton manufacturing plant in 2010 because Dow chemicals closed its adjacent facility which was the only UK manufacturer of Ethylene Oxide, a critical raw material, and it would be expensive for it to transport it from the continent<sup>427</sup>. The Wilton plant was formerly owned by ICI.

Saudi Basic Industries Corporation (formerly Huntsman UK) has an 865,000 mt/year ethylene /400,000 mt/year propylene cracker, a large-scale aromatics facility and a 400,000 mt/year low density polyethylene (ldPE) plant<sup>428</sup>.

Stepan UK has a plant in Stalybridge Cheshire where it manufactures alkanolamides, acid catalysts, and hydrotropes. It is a leading merchant producer of surfactants and clients include large UK manufacturers of soap powders.

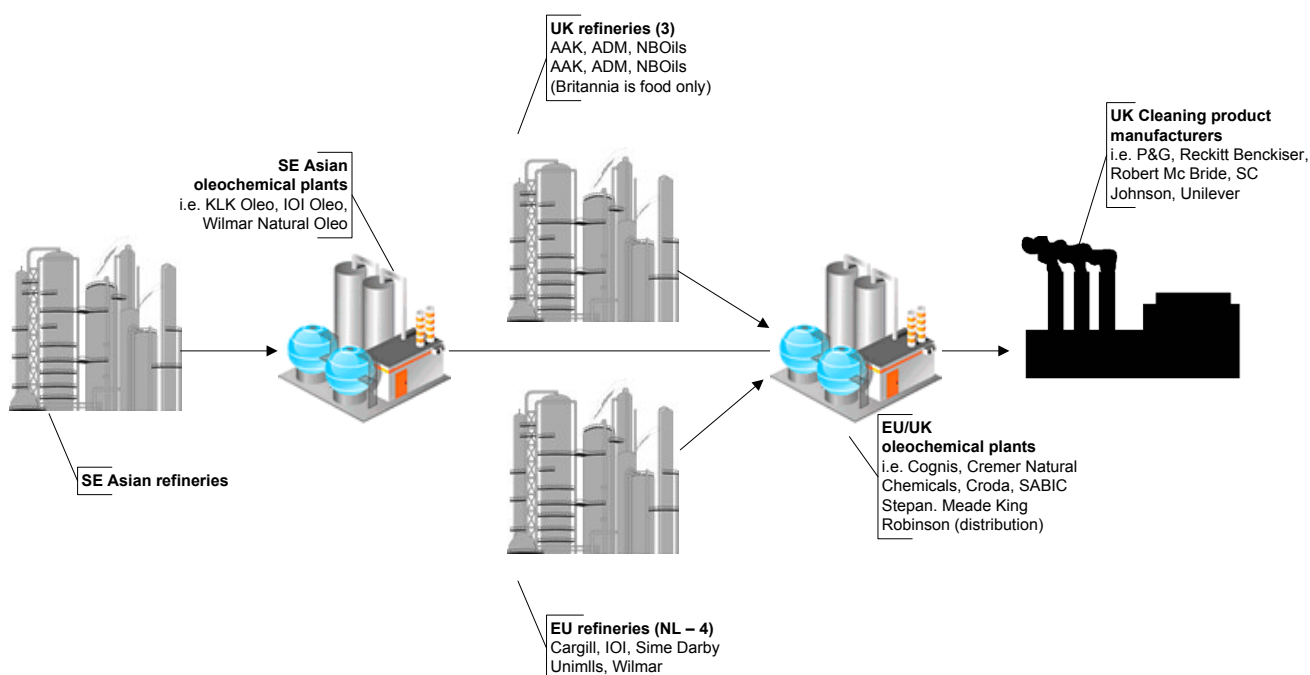


Figure 9.1: Structure of the UK cleaning products supply chain, including key players

## 10. Use of palm in soap, personal care and cosmetics

### 10.1 Soap



(Image source: Horia Varlan\_cc flickr)

Soap	
Types of products:	Bar soap
Estimated UK volumes:	18,750 t of palm oil (approximately 15,000 t of palm oil and 3,750 t PKO), sourced from UK refineries. 1,396 mt certified RSPO, 50 mt GreenPalm.
Palm component:	Palm Oil, Palm Kernel Oil
Key players:	The Stephenson Group, John Drury & Co., Kay's, PZ Cussons, Sigma Soap, Soapworks, Standard Soap Company, Unilever.
Implications for policy development:	While the UK's main soap base producer has taken steps to secure a supply of RSPO certified palm oil, they have indicated that there is limited demand from their customers. However smaller manufacturers/retailers are seeking to differentiate themselves in the marketplace through use of sustainable palm oil or elimination of palm oil, mainly for products sold as 'natural' or 'organic'.

### 10.1.1 Background

Soap is considered a surfactant (a type of oleochemical), and accounts for around 30% of the current global surfactant market<sup>429</sup>. Anionic surfactants, which include soap, are most widely used for cleaning processes because many are excellent detergents.

The two main types of fats used in soap production are palm oil and tallow (rendered animal fat)<sup>430</sup>. Tallow was historically the primary raw material for soap manufacture in the UK<sup>431</sup>, though this has anecdotally decreased since the outbreak of the bovine spongiform encephalopathy in the late 1980s<sup>432</sup>. Alternatives such as olive, coconut and hemp are in limited use.

To make a solid soap base, the oil is combined with caustic soda (otherwise known as sodium hydroxide or lye). Alternatively, the oil can be combined with potassium hydroxide to make a liquid soap base.

Where palm oil is used to make the soap base, it contains around 75% palm oil, in a ratio of 4:1 of crude palm oil (CPO) to crude palm kernel oil (PKO). CPO is used to give a hard consistency to the product, while PKO is used for its foaming properties<sup>433</sup>.

Soap base manufacturers source crude palm oil from refineries or commodity traders. Soap bases (or 'noodles') are then supplied to secondary manufacturers who add perfumes, colorants and other ingredients (accounting for less than 2% of the total finished weight) and give the soap their final form<sup>434</sup>.

### 10.1.2 Volumes of palm used in soap

It is estimated that in 2009, 25,000 mt of soap base was manufactured in the UK. Most of the palm oil used in domestic soap base manufacturing is sourced from UK refineries, an estimated 18,750 mt of palm oil (approximately 15,000 mt of palm oil and 3,750 mt PKO)<sup>xlv</sup>. It is estimated that a further 40,000 mt of soap base was imported into the UK, mainly from South East Asian manufacturers, equivalent to 30,000 mt of palm oil (approximately 24,000 mt of palm oil and 6,000 mt PKO).

In addition to imported soap bases manufactured into soap bars in the UK, approximately 200,000 mt of finished soap bars are also imported, mainly from Germany and Thailand. This is equivalent to approximately 120,000 mt of palm oil and 30,000 mt of PKO.

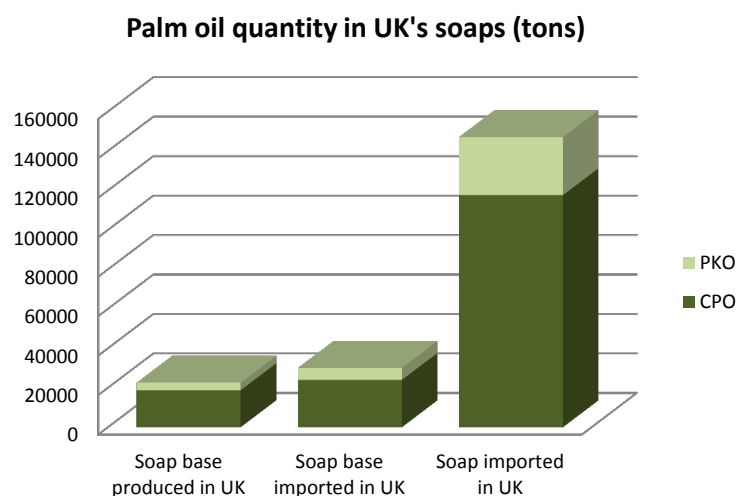


Figure X. Volumes of palm used for soap in the UK

<sup>xlv</sup> Assuming soap bases contain about 75% palm oil, in a 4:1 ratio of palm oil to PKO

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### 10.1.3 UK soap sector

In the UK, manufacturers have reported a small demand for certified sustainable palm oil used in soaps. It is estimated that the UK soap base manufacturing sector is currently using around 6% segregated RSPO certified palm oil, equivalent to around 1,000 mt. Current use has been attributed to retailer demand<sup>435</sup>.

There are UK three companies producing approximately 25,000 mt/year of soap base. The major one is the Stephenson Group, producing around 60% of the UK output<sup>436</sup> at their manufacturing facility in Horsforth, Leeds<sup>437</sup> and exporting over 80% of their production<sup>438</sup>. The Stephenson Group are an RSPO member<sup>439</sup>, and have signed a deal with New Britain Palm Oil to supply them with RSPO certified palm oil<sup>440</sup>, which they are actively marketing to customers<sup>441</sup>. The other two soap base manufacturers are John Drury & Co., a contract manufacturer with a soap milling base manufacturing plant in West Yorkshire, United Kingdom<sup>442</sup>, and Kay's, who also are a contract and private label manufacturer with a site in Ramsbottom, Lancashire<sup>443</sup>.

There are a further five branded and three contract soap manufacturers in the UK, which use soap base to produce finished products, as well as a number of smaller operators.

The Body Shop<sup>xlv 444</sup> uses a soap manufacturing facility (Soapworks) in Glasgow, Scotland, with the rest of their manufacturing contracted<sup>445</sup>. In addition to supplying the Body Shop, Soapworks also manufactures soaps for Sainsbury's, Marks & Spencers, Penhaligon's London, Gilchrist & Soames, The Co-operative, Pacific Direct (hotel guest toiletries), Asprey, The White Company, Elemis, dr.organic and superdrug<sup>446</sup>. The Body Shop is an RSPO member, and their manufacturing facility in Glasgow has indicated that they were the world's first supplier of soaps made with Sustainable Palm Oil and since have supplied some of the world's leading retailers with this soap base<sup>447</sup>.

Other players in the UK market include:

- PZ Cussons, with a manufacturing facility at Agecroft, Manchester produces soaps under the following brands: Imperial Leather, Carex, Original Source and Morning Fresh<sup>448</sup>
- Sigma Soap, a contract and private label manufacturer with a manufacturing unit, located north of Manchester<sup>449</sup>.
- Standard Soap Company, a contract manufacturer with a site in Leicestershire<sup>450</sup>.
- Unilever, manufacturing the Dove and Lux brand soaps.

There are also examples of smaller manufacturers in the UK taking steps towards sourcing sustainable palm oil, including Droyt and Liz Earle, which each purchasing 25 mt of GreenPalm certificates in 2009<sup>451</sup>, and Neil's Yard<sup>452</sup> and Weleda<sup>453</sup>, who reported their palm oil as coming from sustainable sources in Colombia. There is currently one RSPO certified palm plantation in Colombia (Daabon Organics), with a production 27,000 mt/year of palm oil and 2,000 mt/year PKO<sup>454</sup>. Previously, Daabon was also The Body Shop's supplier of sustainable palm oil<sup>455</sup>.

Others have taken the approach to replace palm with alternatives, such as coconut oil and animal fats. For example, in Lush developed a soap base that does not contain palm oil<sup>xlviii</sup>, which is now used in all of their soaps<sup>456</sup>. They had previously used an estimated 390 mt/year of soap base made from palm oil<sup>457</sup>. However, they have indicated that small amounts of palm oil are still present in some products, which they are seeking to eliminate<sup>458</sup>.

<sup>xvi</sup> In November 2010 the Soapworks management undertook a buy-out from The Body Shop. Soapworks had been The Body Shop's only manufacturing facility. They now contract manufacturing to Soapworks.

<sup>xvii</sup> The soap base contains sunflower, rapeseed and coconut oil.

## 10.2 Personal care and cosmetics

(Image source: Alyson Hurt\_cc flickr)



Personal care and cosmetics	
<b>Types of products:</b>	Body wash, skin care (cleansers and moisturisers), shampoo and conditioner, shaving foam, make-up.
<b>Estimated UK volumes:</b>	13,000 mt surfactants (oleochemical). No known RSPO certified.
<b>Palm component:</b>	Oleochemical. Sodium Laurel Sulfate (SLS) and Sodium Laureth Sulfates (SLES) are particularly important derivatives (from PKO). Also, glycerine and triacetin.
<b>Key players:</b>	Beiersdorf, Colgate-Palmolive, L'Oreal, PZ Cussons, Procter & Gamble, Robert McBride, Unilever.
<b>Implications for policy development:</b>	There is awareness by key players of concerns about the sustainability of palm oil in personal care and cosmetics products. However, the volume of actual palm oil (as opposed to oleochemical derivatives) in personal care and cosmetics products is small. Sustainability of oleochemical derivatives is limited by supply chain constraints. Company commitments to sourcing sustainable palm oil by 2015 do not necessarily include oleochemical derivatives found in personal care and cosmetics products, other than Beiersdorf who have specifically made a commitment about derivatives.

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## 10.2.1 Background

Palm-derived oleochemicals are used in the personal care sector as surfactants<sup>xlix</sup>, emollients<sup>i</sup> and humectants<sup>ii</sup>, and also as a viscosity modifier, conditioning agent and antioxidant.

Personal care products contain several different types of surfactants which can be derived from palm kernel oil and coconut oil (known together as lauric oils).

Anionic surfactants include Sodium Laurel Sulfates (SLS) and Sodium Laureth Sulfates (SLES), which are the most commonly used surfactants in shampoos<sup>459</sup>.

Cationic surfactants have a limited use in rinses and hair conditioners<sup>460</sup>.

Amphoteric surfactants are particularly mild, and are used in personal care formulations such as mild shampoos, baby and child-cleansing formulations, shower and bath gels, body and facial washes and shaving foam but also in skin care products like cleansing milks or eye-make up removers. They provide detergency, foaming and foam stabilising properties and include for example betaines and amphotacetates<sup>461</sup>.

Non-ionic surfactants are used as humectants, conditioners, emulsifiers, wetting agents, thickeners and foam stabilizers in shampoo, bubble bath, hand wash, body wash and facial cleansers<sup>462</sup>. They include alkanolamides and aminoxides<sup>463</sup>. Alkyl Polyglucosides (APG) are important non-ionic surfactants used in the personal care and cosmetics industry.

Glycerine (also known as glycerin and glycerol) is also widely used in the personal care sector. It is a by-product of the production of biodiesel and can also be produced by saponification of fats (e.g. soap-making). It can be made from vegetable oils such as palm and soy oil and animal fats. It is used to improve smoothness, provide lubrication and as a humectant in toothpaste, shaving cream, mouthwash, skin and hair products. It is used in cosmetics such as blush, concealer, foundation, lipstick, face powder, mascara, eyeliner and eyebrow pencil<sup>421</sup>. Triacetin (glyceryl triacetate) is produced from high grade glycerine, and is used in skin care products for fragrance and to aid in the dissolving and mixing of ingredients.

There are a number of other oleochemical ingredients commonly used in cosmetics which can be derived from palm oil and palm kernel oil, including for example Isopropyl Myristate (mascara, blush), Glyceryl Stearate (concealer), Sorbitan Stearate (blush), Sorbitan Sesquisteate (face powder, eye shadow), Ascorbyl Palmitate (eye shadow), Tocopheryl Acetate (eye shadow), Stearyl Alcohol, Oleyl Alcohol and Octyldodecanol (foundation and eye make-up), PEG-6 Sorbitan Oleate/Stearate (eyeliner, eyebrow pencil), Polysorbate 20, 60 (eyeliner, eyebrow pencil) and Ethylhexyl Palmitate, also called Octyl Palmitate, (eye shadow)<sup>422</sup>. While these ingredients can also be derived from other vegetable and animal fats, it is likely a significant proportion of the oleochemical feedstock is palm kernel oil<sup>423</sup>.

## 10.2.2 Volumes of palm used for personal care and cosmetics

In 2010, it was estimated that global personal care market was split between body/handwash (14%), shampoo/haircare (22%), skincare (26%), cosmetics (20%) and other (17%)<sup>467</sup>.

Shampoos are the largest consumer of surfactants in the personal care market, using SLS and SLES as their primary ingredient (as detergents and foam boosters)<sup>468</sup>. Shampoo is made up of 70-80%

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<sup>xlix</sup> Surface Active Agents, which are detergents. They are also used in cosmetic products as emulsifiers, allowing incompatible substances, such as oil and water, to mix together within a product or to dissolve one another.

<sup>i</sup> An ingredient which softens and smooths the skin. Many emollients are oils that have an occlusive (air tight) action that provide a barrier against water loss from the skin.

<sup>ii</sup> An ingredient which holds and retains moisture.



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de-ionized water, surfactants (detergents and foam boosters), thickeners, conditioning agents and preservatives<sup>469</sup>. The UK hair care sector is estimated at more than 500 million units, with shampoo at around 33% of the market, followed by conditioners at 23% and hair colorants, styling aids and hairsprays making up the rest<sup>470</sup>.

The use of surfactants in the UK personal care sector is estimated at 13,000 mt of PKO equivalent, which has been calculated by dividing the total UK surfactant market between personal care and cosmetics, cleaning (estimated at 23,000 mt) and industrial uses (estimated at 10,000 mt). This estimated should be treated with caution, as more work is needed by the sector to understand the extent to which palm-based oleochemicals are used.

It is estimated that the cosmetics industry uses up to 8% of the global supply of palm oil (including palm kernel oil)<sup>471,472</sup>. However, given that use of palm oil in cosmetics is almost exclusively as oleochemicals, it is difficult to use this figure to estimate what quantities are used in the UK, as the proportion of oleochemical feedstocks derived from palm produced domestically or imported are unknown.

### 10.2.3 UK personal care sector

The UK personal care sector is making progress towards use of sustainable palm oil derivatives, but is limited by supply chain constraints.

The oleochemicals used in personal care and cosmetics products are sourced both from manufacturers in South East Asia as well as European manufacturers and traders.

A number of the major players in the personal care industry have committed to using 100% certified sustainable palm oil by the year 2015, though this does not necessarily include oleochemicals, which are not technically 'palm oil' at the point where the personal care manufacturers procure it as a raw material for their process.

Some companies have indicated they are working with their suppliers to identify the sources of the palm oils used with the aim of eliminating non certified materials from their supply chains. Currently, the scope of the RSPO makes it challenging to procure certified derivatives of palm as sustainable. However, they do have a derivatives working group, and it is also possible for companies to purchase GreenPalm certificates, provided they have sufficient information to estimate likely palm content.

The main players are as following:

- Beiersdorf brands include Eucerin, Labello, La Prairie, Nivea and SBT. They are an RSPO member, and have committed to seeking significant parts of their PO/PKO derivatives from RSPO certified (segregated) sources by 2015, and have begun working with their suppliers on this. They will purchase GreenPalm until this is achieved<sup>473</sup>
- Colgate-Palmolive owns the Palmolive, Colgate and Soft & Gentle brands. Globally, they have indicated that they purchase less than 90,000 mt of palm oil per year<sup>474</sup>. They are an RSPO member, and have stated that their 'palm oil is purchased as a commodity and the brokers periodically assert that as best can be determined, it is sourced legally and in accordance with that country's environmental standards'. They have also indicated that they will continue to seek sources of sustainable palm oil, but they have no time-bound target<sup>475</sup>.



- L'Oreal owns brands such as Biotherm, Garnier, Kiehl's, Lancôme, L'Oreal, La Roche-Posay, Maybelline, Redken, Softsheen Carson, Shu Uemura and Vichy . The Body Shop is also owned by L'Oreal. They have 38 production sites across the world. None of these are located in the UK. They are members of RSPO and have stated that their global use of palm oil is around 300 mt, all of which is RSPO certified . This includes crude oil and direct fractions, but not derivatives.
- PZ Cussons brands include Carex, Charles Worthington, Imperial Leather, Morning Fresh, Original Source, and St-Tropez<sup>478</sup> . They are a member of RSPO, and have stated that they will make a time-bound commitment to 100% RSPO<sup>479</sup> .
- P&G has production facilities in London, Manchester and Seaton Delaval (Northumberland)<sup>480</sup> . As noted above, they also have an oleochemical manufacturing facility in Malaysia<sup>481</sup> . They have a wide range of brands, including hair care, (Aussie, Fekkai, Head & Shoulders, Herbal Essences, Natural Instincts, Nice n' Easy, Nioxin, Pantene, Pert, Zest, Vidal Sassoon and Wella), skin care (DDF, Olay, SK-II), shaving cream (Gillette, Venus), and cosmetics (Cover Girl) as well as a number of fragrances<sup>482</sup> . They have committed to sourcing only responsible and sustainable palm oil by 2015<sup>483</sup> .
- Robert McBride manufactures private label personal care products, for example for retailers<sup>484</sup> .
- Unilever personal care brands include Dove, Lynx, Lux, Vaseline, Sunsilk and Sure<sup>485</sup> . They also recently purchased the Ablerto Culver group, which owns the Nexus, Noxema, Simple, Soft & beautiful St-Ives, TRESemmé and VO5 brands<sup>486 487</sup> . Alberto Culver has a manufacturing facility in Basingstoke<sup>488</sup> . Unilever has been leading the RSPO derivatives working group.

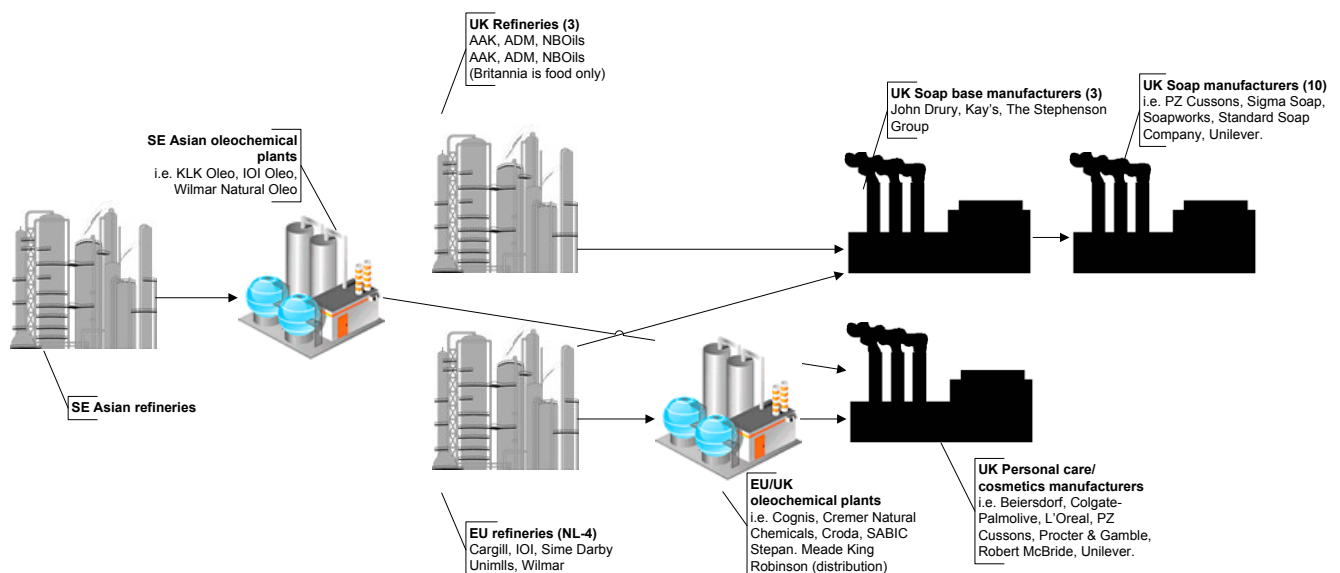


Figure 10.1: Structure of the UK personal care products supply chain, including key players

# 11. Use of palm in industry

## 11.1 Industrial uses



(Image source: Ms.G\_cc flickr)

Industrial uses	
<b>Types of products:</b>	Adhesive tape, inks, insect repellents, paints, pesticides, platics, lubricants, synthetic fibres, tobacco products.
<b>Estimated UK volumes:</b>	10,000mt. No known RSPO certified.
<b>Palm component:</b>	Mainly oleochemical. Also palm oil and palm olein as lubricants.
<b>Key players:</b>	Widespread industry usage.
<b>Implications for policy development:</b>	The palm oil and oleochemical derivatives used in industry are in many cases not contained as ingredients in the final products, which makes leverage through consumers challenging. This is in addition to the supply chain constraints associated with procuring oleochemicals derived from sustainable palm oil.

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### 11.1.1 Background

Use of oleochemical derivatives is widespread in many industries, not all of which have been subject to the same level of scrutiny as the food, energy and increasingly, cleaning and personal care sectors. As such, limited information is available, and companies engaged in manufacturing of products containing these derivatives are not generally aware that the products they are using have been derived from palm feedstocks.

Palm oil derivatives have a wide range of uses, including for example<sup>489</sup>:

- Dimethyl mixed ester is used as solvent for paints and coatings, paint remover.
- Dimethyl Phthalate and Diethyl Phthalate are used as plasticizers for resins, in insect repellents, coatings, MEKP (peroxide), DDT (pesticide), GC, in mining and perfumes.
- Refined glycerine is used in pharmaceuticals, tobacco products, surface coatings, paper, inks, lubricants, textiles, urethane polymers. As a derivative, it is found in nitroglycerine, propylene glycol, epichlorohydrin and arcolein.
- Fractionated methyl esters include biofuel (see Section 8.2), lubricants, metal-working fluids, rubber processing agents and oiling agents for textiles.
- Ethylene Bis-Stearamides are used in plastic lubrication, as an ink dispersant, asphalt binder, synthetic rubber, wire drawings, defoaming agents, synthetic fibres and adhesive tape rolls.
- Triacetin is used as a plasticizer in cigarette filters, perfume formulation, cosmetics, inks, paints, nitrocellulose, cellulose nitrate, ethyl cellulose and cellulose acetate butyrate.

Other applications of palm oil and palm olein include as an industrial lubricant, particularly in cases where low toxicity is desired, such as for machinery used in food manufacturing processes and applications where conventional (petroleum-derived) lubricants would be a threat to environmentally sensitive areas, such as waterways<sup>490</sup>.

### 11.1.2 Volumes of palm used in industry

It is estimated that globally, approximately 26% of palm oil is used for industrial purposes<sup>491</sup>, which is loosely designated as non-food uses (including energy, cleaning and personal care).

Based on quantities that have already been accounted for in other uses (described in previous sections), a volume of 10,000 mt has been estimated for industrial uses. However, because it is normally palm oil derivatives that are used, there is a great degree of uncertainty around this figure, and in practice the quantity of palm-derived feedstock used in the UK industrial sector could be much higher.

It is likely that some of this is being procured from UK oleochemical manufacturers, some from European manufacturers, and some from oleochemical manufacturers in producing countries such as Indonesia and Malaysia.

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### **11.1.3 UK industrial sector**

In general, the palm oil used in the industrial sector is derivatives, and has the same challenges related to supply chain constraints as the food additives, cleaning, personal care and cosmetics sectors. However, unlike these sectors, the products and ingredients containing palm in industry are often used as part of manufacturing processes and are not visible to the consumer in the end product. This makes leveraging manufacturers challenging.

There is no sustainable palm oil known to be used in any of the products listed in Section 11.1.1.

## 12. Consumption of palm products in the UK

### 12.1 Key Findings

Palm oil is consumed directly and indirectly by end users. The retail sector shows a much higher commitment to sustainable sourcing of palm oil, compared with the service sector. Indirect uses (where the palm product is not physically an ingredient or not a visible ingredient) show little commitment to sourcing sustainable palm oil.

Indirect use includes for example in animal feed, which is not an ingredient in the end product, but was used in the production of the end product. Similarly, there are many industrial uses where palm oil is used as part of an intermediary process, but not contained in the end product (for example, industrial lubricants used in manufacturing machinery). Energy is another example of palm oil and palm kernel that is used indirectly by end consumers. These indirect uses are estimated to account for around 25% of the consumption of palm oil imports and 100% of palm kernel meal imports. Limited steps have been taken in the energy sector as a result of legislation, but none of the other sectors show any significant movement towards commitments to sustainable sourcing of palm oil and palm kernel meal.

It is estimated that just under half of all imported palm oil (315,000 mt) reaches end users through retail outlets. This includes in food as well as cleaning, personal care and cosmetics products. The retail sector has shown strong commitment to sourcing sustainable palm oil, with all of the major retailers committing to sourcing sustainable palm oil for their own-brand products (either RSPO certified or GreenPalm) by 2015 or sooner. These commitments do not include branded products, which are estimated to account for 80% of product lines.

The service industry includes restaurants, pubs and hotels as well as provision of facilities management (FM), contract catering and cleaning to the public and private sector estate. The key players in the service industry are the FM providers and the wholesale delivered distribution network, which is starting to show awareness of sustainability of palm oil. Together, this industry accounts for around 150,000 mt of palm oil use. Of this, it is estimated that 30 -50% quantities of palm oil can be attributed to the public sector, equivalent to 45,000 - 75,000 mt of palm oil. This represents 7% - 12% of the total import of palm oil and palm kernel oil into the UK (using 2009 figures, expected to be similar for 2010 and 2011).

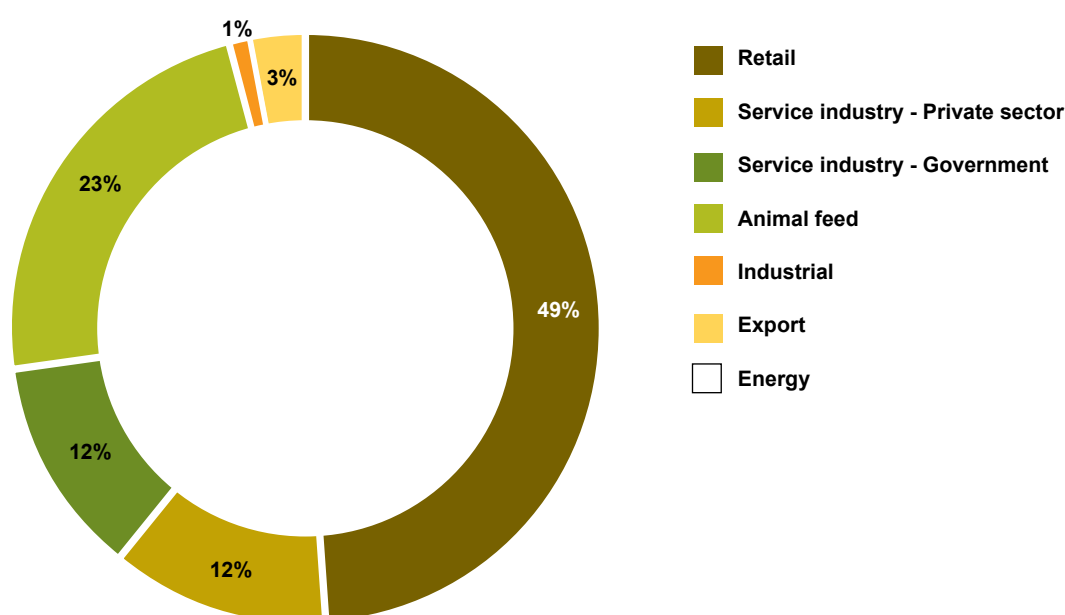


Figure 12.1: Consumption of palm oil in the UK

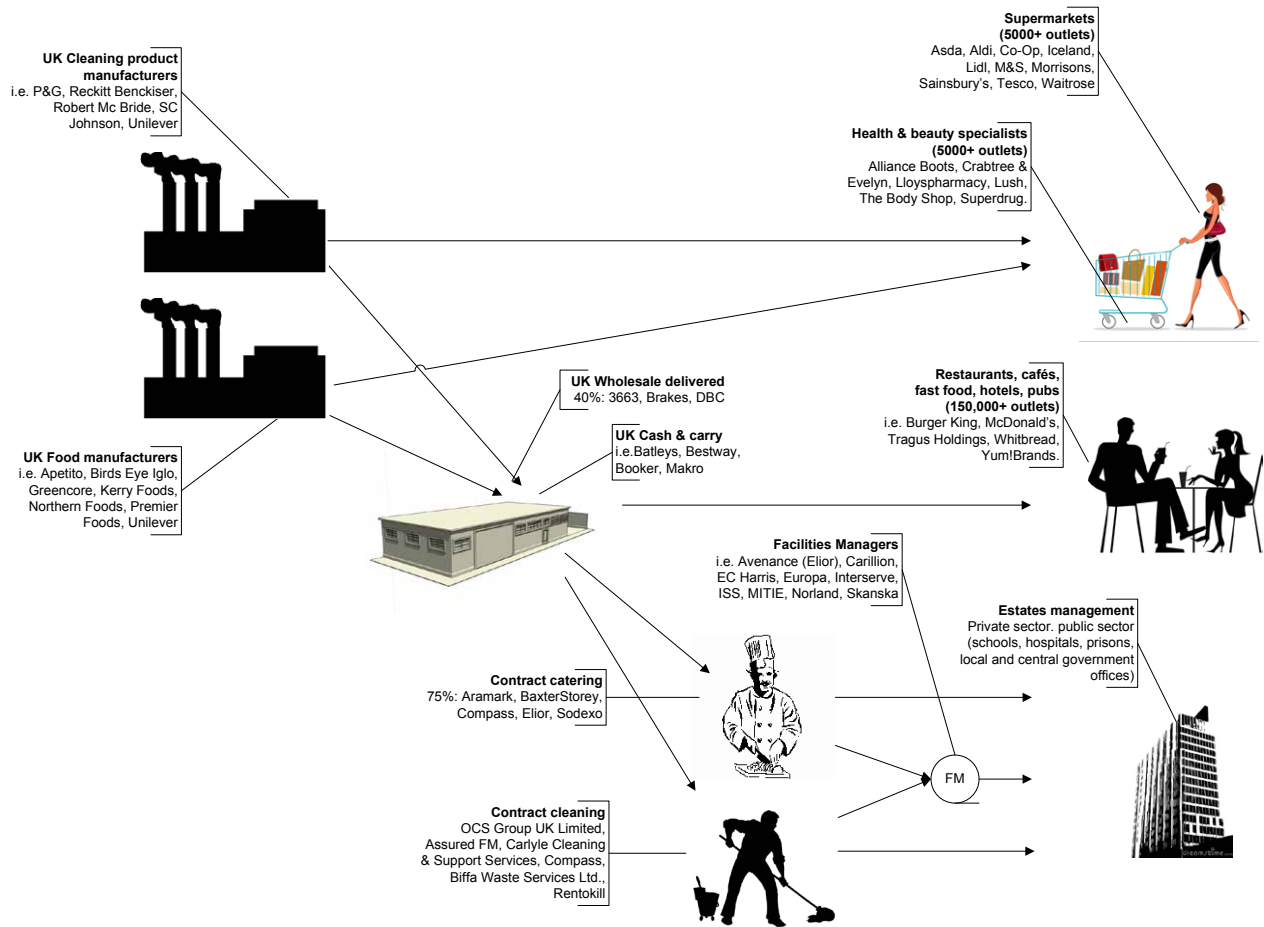


Figure 12.2: Structure of UK consumer supply chain with key players



## 12.2 Retailers



(Image source: 11th Earl of Mar\_cc flickr)

Retailers	
<b>Types of products:</b>	Food, cleaning, personal care, cosmetics, biodiesel
<b>Estimated UK volumes:</b>	Supermarkets: 62,500 mt own-brand, 250,000 mt branded. RSPO certified volumes unknown. 16,000 mt GreenPalm
<b>Palm component:</b>	All palm oil, palm kernel oil, fractions and derivatives. Palm Kernel Meal an input to animal feed in meat products.
<b>Key players:</b>	Supermarkets: Tesco, Asda, Sainsbury's, Morrisons, Co-Op, Waitrose, Aldi, Marks & Spencers, Lidl and Iceland. Health & beauty specialists: Boots, Superdrug, The Body Shop, Crabtree & Evelyn, Lush.
<b>Implications for policy development:</b>	Though significant progress is being made by retailers to source sustainable palm oil, their commitments only cover own-brand products, which is a comparatively small proportion of the total palm oil contained in the products on supermarket shelves. The leverage point for the branded sector is likely to be the brand owners/manufacturers, which have been examined in previous sections of this report

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### 12.2.1 Background

The retail sector in the UK includes a range of formats: convenience and specialist food stores, supermarkets, superstores, hypermarkets (a combination of a supermarket and a department store), market traders, discount stores, retail cooperatives, department stores, mail order companies and warehouses. Food, personal care and cleaning products are purchased by customers at supermarkets as well as specialty retail outlets.

UK retailers sell two types of products: own-label or private label brands, which carry the name of the retailer, and branded products.

Retailers purchase almost all of their products from manufacturers, though in a few cases also source from distributors. For own-branded products retailers have control over the content of the product and the manufacturers produce them as per the specifications agreed, or they may have their own manufacturing facilities. They do not have control over the content of the branded products.

The number of product lines varies on size, with the biggest retailers carrying upwards of 40,000 lines and mid-sized retailers in the range of 12 – 14,000<sup>493</sup>.

### 12.2.2 Volumes of palm used in retail

It is estimated that UK supermarkets carry products containing 62,500 mt of palm oil in their own-brand products and a further 250,000 mt of palm oil is used in branded products<sup>iii</sup>.

Supermarket retailers interviewed as part of this project have indicated around 100 of their food product lines contain palm oil (not including derivatives), with thousands more using palm oil derivatives<sup>494</sup>. It was also stated that all cosmetics and personal care product lines are likely to contain palm oil derivatives.

The volume of palm used by health and beauty retail specialists is unknown, on the basis that it is mainly oleochemical derivatives. Health & beauty specialist retailers have found it challenging to identify the volume of palm oil derivatives in their products. Estimates for palm oil (not including derivatives) have been in the hundreds of mt/year for a single retailer's own-brand products, whereas for derivatives such as sodium laureth sulfate (SLES), palmate and glycerine (which are in most cosmetics and personal care products) palm oil derivatives are estimated to be in the thousands of mt<sup>495</sup>.

### 12.2.3 Sustainability of the UK retail sector

In the UK, there are a reported 86,168 retail outlets with food, beverages or tobacco predominating. A portion of these specialise selling bread, cakes and confectionary (6,362). There are a further 3,328 retail outlets specialising in cosmetics and toiletries<sup>496</sup>.

The UK food retail sector is dominated by four companies: Tesco, Asda, Sainsbury's and Morrisons. Tesco is the largest UK retailer, with 2,482 stores<sup>497</sup>, including more than 1000 Tesco Metro convenience outlets. They also own a subsidiary 'One Stop' with a separate distribution network<sup>498</sup>. ASDA currently has over 300 stores in the UK, including supermarkets, superstores, supercentres and 24 ASDA Living outlets<sup>499</sup>. Sainsbury's has 890 stores, including 547 supermarkets and 343 convenience outlets<sup>500</sup>. Morrisons is the fourth largest UK retailer, with 425 stores<sup>501</sup>. Other significant players in the UK retail market include Co-Op, Waitrose, Aldi, Marks & Spencers, Lidl and Iceland.

<sup>iii</sup> This estimate has been undertaken using GreenPalm purchases for retailers committed to sourcing 100% of volume currently, multiplied by market share, and assumed 20% of palm oil containing products are own-brand.

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All of the major UK supermarkets are members of the RSPO, and have set targets of using sustainable palm oil in their own-brand products by 2015 or before (see Annex C for the full list of commitments). The British Retail Consortium also has a representative on the RSPO Executive Board<sup>502</sup>.

Targets set by supermarkets do not include branded products, the proportion which varies significantly by product types: estimates are that between 20 – 40% of product lines are own-brand<sup>503</sup>. It is estimated that if all supermarkets meet a 2015 target, 65,000 mt of sustainable RSPO palm oil would be used in own-brand products. This does not include derivatives. It is estimated that a further 156,250 - 250,000 mt of palm oil is used in branded products, and moving to sustainable palm oil is dependent on the branded manufacturer offering products with certified sustainable RSPO palm oil<sup>504</sup>. Almost all of the 40,000 mt of RSPO certified palm oil (mass balance and segregated) that has been processed by UK refineries is likely to have ended up in supermarkets<sup>505</sup>.

UK retailers Marks & Spencer's and Waitrose have purchased almost 16,000 mt GreenPalm certificates in both 2008 and 2009. Other supermarkets include palm oil sustainability requirements in the specifications they agree with their manufacturers, and therefore purchases of GreenPalm certificates would be by the manufacturer rather than the supermarket.

Several supermarket retailers, including Co-op, Sainsbury's and Waitrose, also label products as containing palm oil (as opposed to 'vegetable oil', which is the current legal labelling requirement)<sup>507</sup>. This could become mandatory for all retailers if an EU proposal on the provision of food information to consumers goes through<sup>iii</sup>. The proposed legal instrument would combine Directive 2000/13/EC on the labelling, presentation and advertising of foodstuffs and Council Directive 90/496/EEC on nutrition labelling for foodstuffs<sup>508</sup>.

Research suggests that just under half of consumers use supermarkets for personal care products<sup>509</sup>. The two main health & beauty specialist retailers in the UK are Boots and Superdrug.

Alliance Boots has 2,473 health and beauty stores in the UK, of which 2,380 included pharmacies. Boots also have pharmacies in 13 Waitrose stores. The Carlyle Group owns Alliance Boots as well as Holland & Barrett. Boots UK is working with their suppliers to use only certified RSPO palm oil by 2014, and has indicated they purchase GreenPalm certificates for the palm oil used in Boots own-brand products, including derivatives where the starting material is known to be palm oil<sup>511</sup>.

Superdrug (part of AS Watson Health & Beauty UK) has over 900 stores in England, Wales, Scotland, Northern Ireland and the Republic of Ireland<sup>512</sup>.

Lloydspharmacy (owned by Celesio) has over 1,650 outlets in the UK, predominately in community and health centres<sup>513</sup>.

Other smaller specialist health & beauty retailers include for example The Body Shop (owned by L'Oreal), Crabtree & Evelyn (owned by KLK, a Malaysian oil palm and rubber plantation company)<sup>514</sup> and Lush.

The Body Shop has a target that 100% of all direct palm oil will be RSPO certified by 2011. They state that they use a relatively small amount of palm oil, and are participating in the RSPO derivatives working group<sup>515</sup>. They have undertaken work directly with suppliers, including termination of a supplier relationship, related to land rights issues in an oil palm plantation. As noted in Section 10,

<sup>iii</sup> Amendment 387: "Oil" together with either the adjective "animal" (or the indication of their specific animal origin) or, as appropriate, an indication of their specific vegetable origin. In cases where certain vegetable oils cannot be guaranteed not to be present, the use of "May contain..." is required".

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The Body shop contracts manufacturing from a factory in Scotland, as well as other contractors outside the UK<sup>517</sup>.

Crabtree & Evelyn is part of KLK's integrated supply chain of oil palm plantations, refining and production of oleochemicals, manufacturing and retail of personal care products, toiletries, home fragrances and fine foods<sup>518</sup>. KLK is an RSPO member and has 5 of its mills RSPO certified, equivalent to 211,978 mt palm oil and 53,030 mt Palm Kernels<sup>519</sup>.

Lush has a campaign against using palm oil, and actively advises their customers to seek alternatives. They have removed palm oil from their soap base and glycerine, estimated to be around 390 mt/year<sup>520</sup>.

## 12.3 Service industry



(Image source: Nouna Andersson\_cc flickr)

Service industry	
<b>Types of products:</b>	Food, cleaning, personal care, cosmetics
<b>Estimated UK volumes:</b>	150,000 mt. Likely a small amount of RSPO certified (e.g. frying fats)
<b>Palm component:</b>	All palm oil, palm kernel oil, fractions and derivatives. Palm Kernel Meal as an input to animal feed in meat products.
<b>Key players:</b>	Wholesale delivered: Brakes, 3663, DBC; Cash & carry: Booker, Makro, Bestway, and Batleys. Foodservice: Compass Group, Sodexo, Aramark UK, Avenance and BaxterStorey. Restaurants: Whitbread, Yum!, McDonald's, Burger King, Tragus.
<b>Implications for policy development:</b>	The sector is showing limited awareness of sustainable palm oil. There is consolidation at the point of wholesale delivered distribution but a weak signal from food service outlets and limited awareness by contract caterers and FM providers.



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### 12.3.1 Background

The UK service industry includes food service outlets (restaurants, fast-food outlets, entertainment and sporting venues), hotels, contract catering and cleaning for private sector and public sector (for example office canteens, hospitals, prisons and schools).

Facilities Management companies manage most of the UK's private sector and government estates. They offer both 'hard services' (maintenance and repair, grounds keeping) and 'soft services' (cleaning and catering). Facilities Managers will normally use contract caterers and cleaners, however in some cases they use their own staff and procure products directly from wholesale distributors.

Large contract catering and cleaning companies generally source around 60% of products from 'delivered wholesale' suppliers and 40% direct from manufacturers.

A focal point in the service industry supply chain are the 'wholesale delivered' companies, who service foodservice outlets and hotels directly, and also supply contract caterers and cleaners.

### 12.3.2 Volumes of palm oil used in the service industry

It is estimated that the service industry in the UK uses around 150,000 mt of palm oil. This is equivalent to almost 23% of the import of palm oil and palm kernel oil.

This has been calculated by subtracting the total retail estimate (315,000 mt), animal feed (150,000 mt), energy (1,000), industry estimate (10,000 mt) and exports (18,000 mt) from the total palm oil and palm kernel oil imports (643,400 mt).

A portion of this estimate for the service industry includes frying fat, which is estimated at 55,000 mt (see Section 6.2).

It is important to note that the animal feed palm oil and PKM is also indirectly attributable to the foodservice sector, as is likely some of the industry estimate.

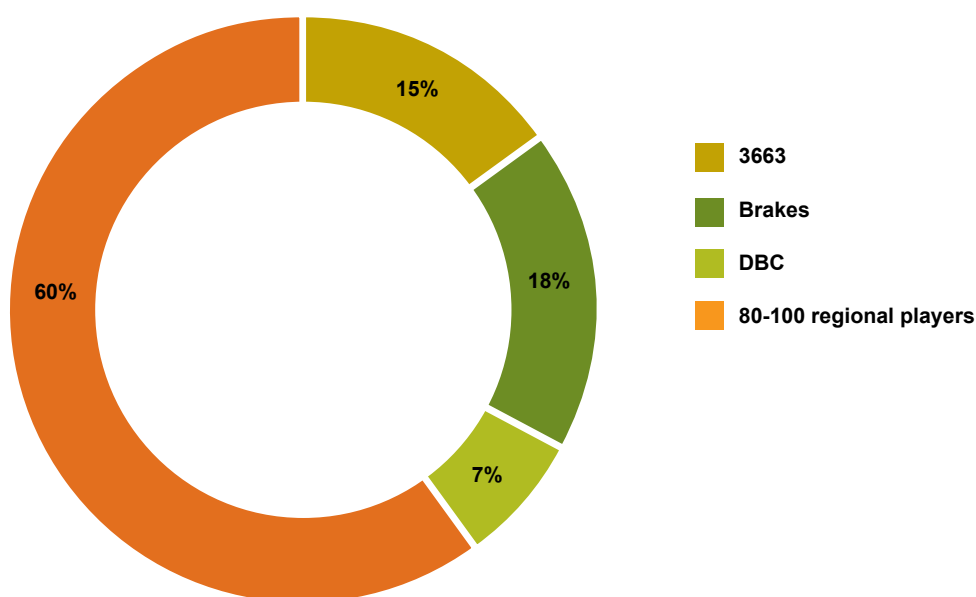


Figure 12.1: Market share of contract catering companies



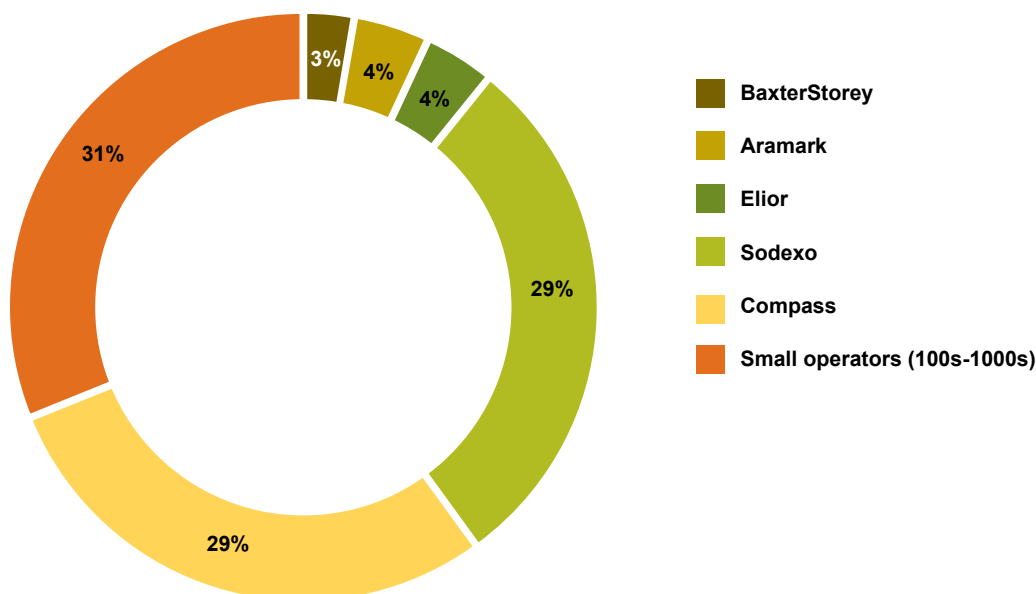


Figure 12.2: Market share of wholesale delivered companies

### 12.3.3 Wholesale delivered and cash & carry sectors

There are three main players in the UK Wholesale Delivered market, the two largest being Brakes and 3663 and DBC a smaller third, which together account for 40% of the UK market.

The large wholesale delivered companies have between 10 – 12,000 product lines, of which <10% is own-brand. For own-brand products, they work with manufacturers on the product specification. Own-brand products are generally 'back-of the house', i.e. ingredients used in kitchens and not seen by customers. For branded products, they have ingredients lists from the manufacturers.

One of the large distributors has identified 110 of their product lines contained palm oil (not including derivatives), however had not taken steps to assess what volume of palm oil this corresponds to.

3663, Brakes, Wincanton, Hays and Gist also undertake contract distribution for manufacturers<sup>521</sup>.

Small owner-manager restaurants and businesses tend to use cash and carry instead of wholesale delivered, including Booker, Makro, Bestway, and Batleys for example<sup>522</sup>.

### 12.3.4 Foodservice sector

Foodservice represents 16% of UK food value at factory/ farm gate prices, 21% of UK food at purchase prices and 34% of UK food at selling prices<sup>523</sup>.

In 2009, there were 128,713 accommodation and food service enterprises in the UK<sup>524</sup>. The 15,120 accommodation enterprises included 9,881 hotels and similar accommodation, 3,329 holiday and other short term accommodation, 1,704 campgrounds and trailer parks and 406 other types of accommodation. There were 61,025 restaurants and mobile food service enterprises, 6,060 event caterers and 976 other foodservice activities<sup>525</sup>.

The foodservice industry is categorised as the profit sector (i.e. restaurants, takeaways, pubs, hotels, leisure) and the cost sector (i.e. staff catering, health care, education and other services)<sup>526</sup>.

The five largest cost sector foodservice companies in the UK are: Compass Group (includes companies like Eurest, Quadrant, Leith's, Scolarest, Medirest, Moto, RailGourmet) Sodexo, Aramark UK, Avenance (part of the Elior Group) and BaxterStorey.<sup>527</sup>

Types	No. of outlets	Million meals
Restaurants	25,474	680.4
Quick Service	29,050	1,873.60
Pubs	51,595	1,061.50
Hotels	48,276	653.9
Leisure	18,725	537.8
Staff Catering	20,874	1,080.10
Health Care	30,682	1,042.00
Education	34,515	1,196.10
Services	3,064	227.8
<b>Total</b>	<b>262,255</b>	<b>8,353.30</b>

Table 12.1: UK market segments by value (2004)<sup>528</sup>

The provision of contract catering services is worth an estimated £3.8 billion in annual turnover and from more than 17,000 outlets serves 1.54 billion meals a year and employees nearly 115,000 people<sup>529</sup>.

Examples of large companies in the UK in the foodservice profit sector are Whitbread (which includes Beefeater, Brewers Fayre, Brewsters, Costa, TGI Friday, Pizza Hut, Marriott, Travel Inn, David Lloyd Leisure), Yum! Brands (which include KFC, Pizza Hut), McDonald's, Burger King, Tragus Holdings (which include Cafe Rouge, Bella Italia, Strada, Mamma Amalfi, Abbaye, Leadenhall Wine Bar and Oriel brands)<sup>530</sup>. The profit sector also includes the provision of contract catering to businesses.

Foodservice sector	Main companies
Restaurants	City Centre Restaurants, Conran, Pizza Hut, Pizza Express, Whitbread, Tragus Holdings
FF/Cafés/Takeaways	McDonalds's, Burger King, KFC, Wimpy, Starbucks
Hotels	Whitbread, Thistle, Queens Moat House, Greene King, Greenalls, Ramada, Hilton, InterContinental Hotels Group, Macdonald Hotels, Best Western Hotels
Pubs	Mitchells and Butlers, Punch Group, Pubmaster, Nomura, Spirit Group and Laurel
Travel	P&O, Servair, Alpha
Leisure	First Leisure, Six Continents, Sodexo, Luminar
Staff Catering	Compass, Aramark, Sodexo
Health Care	National Health Service, Compass, Sodexo
Education	Compass, Sodexo
Services/Welfare	Compass, Aramark, Sodexo

Table 12.2: Main companies operating in the UK foodservice sector

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The food service sector is starting to become involved in discussions about sustainable palm oil.

Compass is an RSPO member.

Sodexo is working with suppliers to reduce the palm oil content of products and to use only RSPO certified palm oil. They have eliminated the use of palm oil for cooking in their kitchens<sup>531</sup>. However, at the same time in 2009 they delisted or reformulated 84 products to remove hydrogenated vegetable oils from their ingredient lists, and palm oil is a key ingredient to replace hydrogenated vegetable oils.

McDonald's (global) is an RSPO member, and have recently committed to joining the RSPO and sourcing only RSPO certified palm oil by 2015<sup>532</sup>. They have identified Cargill as one of their suppliers of palm oil, highlighted in a case study on best practices for sourcing RSPO certified palm oil<sup>533</sup>.

Burger King terminated its relationship with a palm oil supplier following a Greenpeace campaign<sup>534</sup>.

## 13. Consumption of palm products by the UK Public Sector

### 13.1 Public sector



(Image source: UK Parliament\_cc flickr)

The public sector	
Types of products:	Food, cleaning, personal care
Estimated UK volumes:	45,000 - 75,000 mt of palm oil. of palm oil. A small quantity of GreenPalm.
Palm component:	All palm oil, palm kernel oil, fractions and derivatives. Palm Kernel Meal as an input to animal feed in meat products.
Key players:	Catering: Compass Group, Sodexo, Aramark UK, Avenance and BaxterStorey. Wholesale/distribution: 3663, Brakes.
Implications for policy development:	The main consumers of palm are the NHS, schools, further and higher education, the MoD and prisons. They are normally several steps away from the actual suppliers of products and ingredients that may contain palm oil. The leverage points are the Facilities Managers and the contract caterers and cleaning companies, who source from the wholesale delivered companies. A mechanism for implementing sustainability requirements is already in place, through framework contracts and Government Buying Standards.

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### 13.1.1 Background

The main points where palm oil is used by the public sector is in food procurement and catering services. Food and catering includes staff canteens as well as catering in prisons, hospitals, Ministry of Defence sites and schools for example. It is estimated that the public sector spends over £2 billion on food and food services, of which around half is spent on food ingredients, the rest on catering services and kitchen equipment<sup>535</sup>. As set out in the previous section of this report, direct procurement of palm oil is likely only as a frying fat. In all other cases, it will be as an ingredient which can include oil and its direct fractions (normally listed as 'vegetable oil') as well as oleochemical derivatives (flavourings, colourings, emulsifiers).

Cleaning products and cleaning services are used across the Government estate. The palm contained in these products are oleochemical derivatives, and would commonly include surfactants. Palm oil will also be contained in soap products, which are normally sourced by Facilities Managers or contract cleaners. Other palm oil use includes indirectly through diesel fuels in fleet vehicles, fire and ambulance vehicles, and as a proportion of the national electricity mix.

Minor quantities of palm oil derivatives are also likely to be present in paints and other chemicals used in estates maintenance.

The mandated estate has a total area of 10.7 million m<sup>2</sup> and 7,213 holdings, and the Central Government Estate includes over 50,000 buildings and houses and occupies over 12.5 million m<sup>2</sup> of office space within England, Scotland (see Figure 13.1)<sup>536</sup>.

Identifying volumes of palm oil used in the public sector requires liaison with several steps away from the end public sector user. Work undertaken over the course of this study has indicated that contract caterers are able to extract data from their records about oils and fats that they procure for use when providing catering services to the public sector, however data about products which contain palm oil, such as bakery items (bread, morning goods, pastries, biscuits, soups etc.) is not held by them. Wholesale distributors have indicated they do have information available the product ingredients, including palm oil, though in most cases these products are procured by contract caterers who in turn supply the public sector (in many cases as part of an Facilities Management contract), and thus data about the volumes of palm oil supplied collectively to the public sector is not readily available.

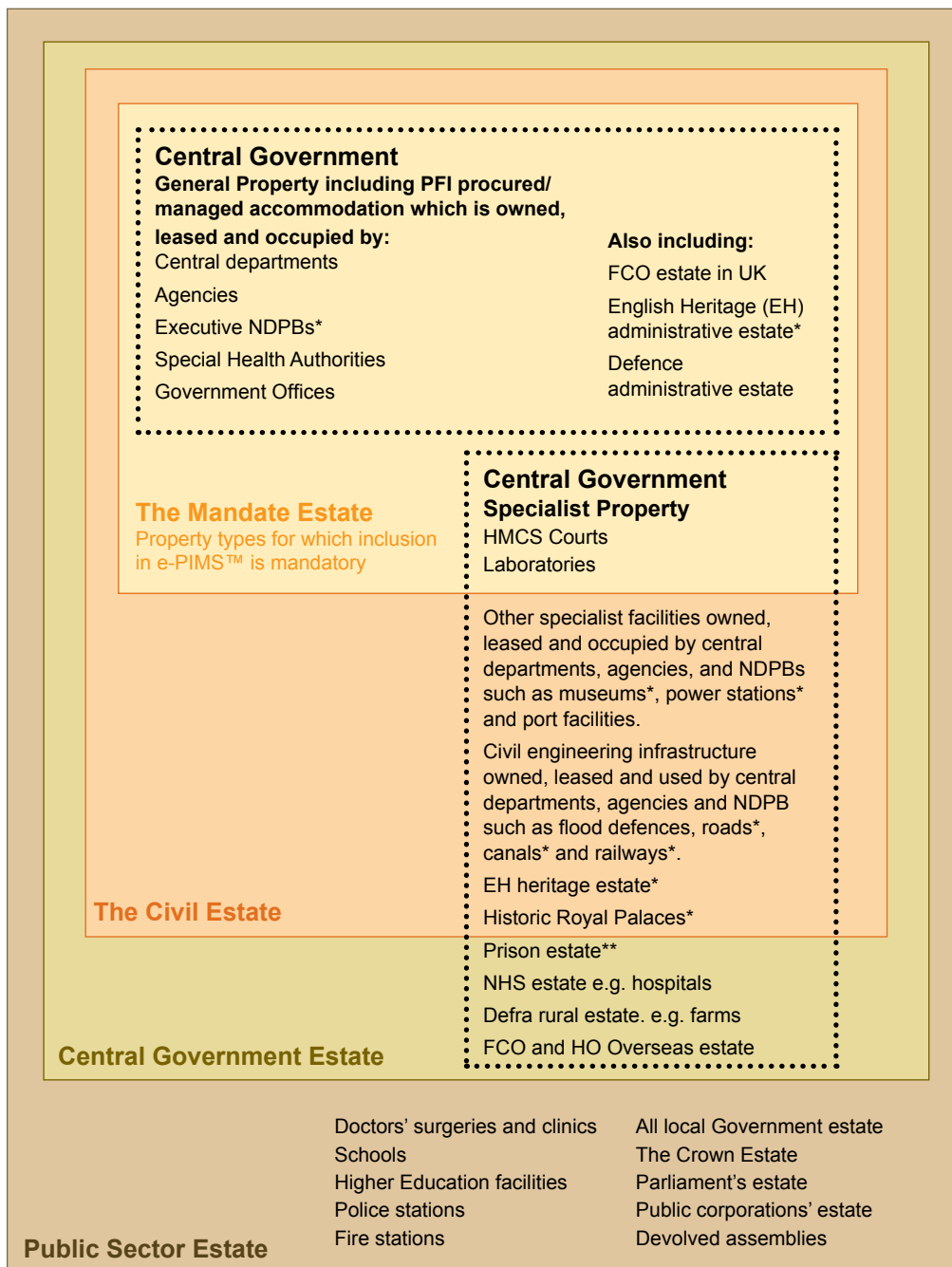


Figure 13.1: The public sector estate<sup>537</sup>



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### 13.1.2 Volumes of palm consumed by the UK public sector

Several of the Facilities Management companies interviewed indicated that the proportion of their business which could be attributed to the public sector was around 50%. Furthermore, public sector expenditure on food and drink procurement in Scotland was calculated at around a third of the total national catering and canteens market<sup>538</sup>.

On this basis, it is estimated that 30 -50% of the service industry estimated quantities of palm oil can be attributed to the public sector, equivalent to 45,000 - 75,000 mt of palm oil. This represents 7% - 12% of the total import of palm oil and palm kernel oil into the UK (using 2009 figures, expected to be similar for 2010 and 2011).

These figures do not include animal feed, which is indirectly attributable to the food sector.

Information was provided by a large contract catering company about the fats and oils that they use for their public sector clients. Products containing palm oil include the following:

- Long life vegetable oil: containing palm oil, rapeseed oil and sunflower oil (equivalent to just over 15,000 litres, of which a significant proportion is palm). The product used is covered by GreenPalm certificates purchased by the manufacturer, AAK.
- Margarines: just over 53,000 kg or 53 mt of margarine, which likely contains at least 50% palm oil<sup>iv</sup>, palm kernel oil and fractions, equivalent to around 26 mt of palm oil

A second example is a company supplying an estimated 10% of the public sector's food requirements (by value) has indicated that more than 100 of their own-brand products (equivalent to about 15%) and almost 400 of their branded products have palm oil listed as an ingredient<sup>539</sup>. They maintain a complete ingredients list for every product based on information provided by suppliers and about 70% of their suppliers are UK based.

### 13.1.3 Consumers of palm in the UK public sector

The most significant consumers of palm in the UK public sector are those that procure large quantities of food. In some cases, this includes direct procurement of food products, but more commonly this is through procurement of catering services.

The Department of Education<sup>540</sup>, the Ministry of Justice National Offender Management Service (NOMS), the National Health Service (NHS) and the Ministry of Defence (MoD) are the four largest areas of public expenditure on food and catering<sup>541</sup> (Figure 13.2), and therefore the four largest consumers of palm.

<sup>iv</sup> A significant proportion of the margarine supplied was for baking, which has a higher palm component than consumer spreads.

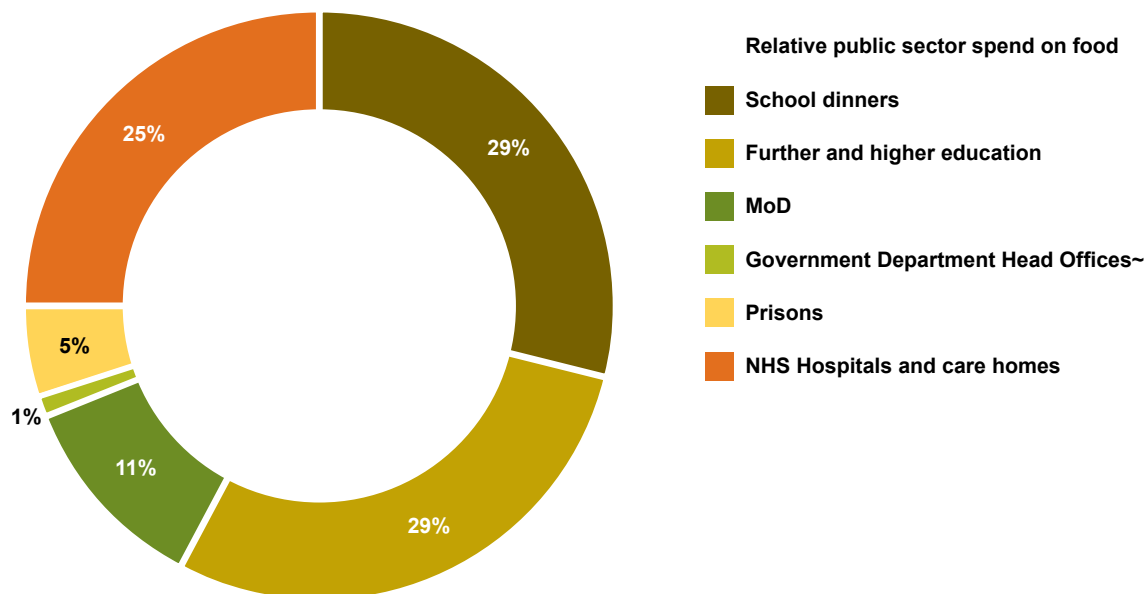


Figure 13.2: Relative public sector spend on food<sup>542</sup>(PSFPI 2010)

Schools, which are part of the Department of Education, spend about £1 billion on catering, of which around £350 million is on ingredients. Higher education and further education are estimated to spend between £350m and £500m on food ingredients per year.

The NHS spends around £300 million on food and £500 million on catering per year, which approximately half is procured NHS Supply Chain framework contracts.<sup>543</sup>

The Armed Forces, part of the Ministry of Defence, spend approximately £135 million on food and delivery per year.<sup>544</sup>

The Ministry of Justice food and catering procurement includes the National Offender Management Service (NOMS), privately run prisons and all contracted catering across the MoJ<sup>545</sup>. The National Offender Management Service (including 128 prisons) spends £54 million on food, through central contracts<sup>546</sup>. Two suppliers of food to public sector prisons provide 98% of food requirements, and the MoJ encourages local business and SMEs to supply through their national supply chain provider, 3663<sup>547</sup>. Private prisons (of which there are 11) are managed by G4S, Sodexo Prison Services and Serco<sup>548</sup>, who operate their own food supply chains<sup>549</sup>. MoJ catering services include contracted catering in courts, headquarters buildings and staff canteens in prisons, and are through central contracts<sup>550</sup>.

Around 1% of public sector food procurement is by central Department offices (including staff canteens and hospitality services). While this is comparatively small, a report from the Public Sector Food Procurement Initiative noted its importance in sending a positive message to the wider public sector when taking steps towards sustainable procurement<sup>551</sup>.

### 13.1.4 Suppliers of palm to the UK public sector

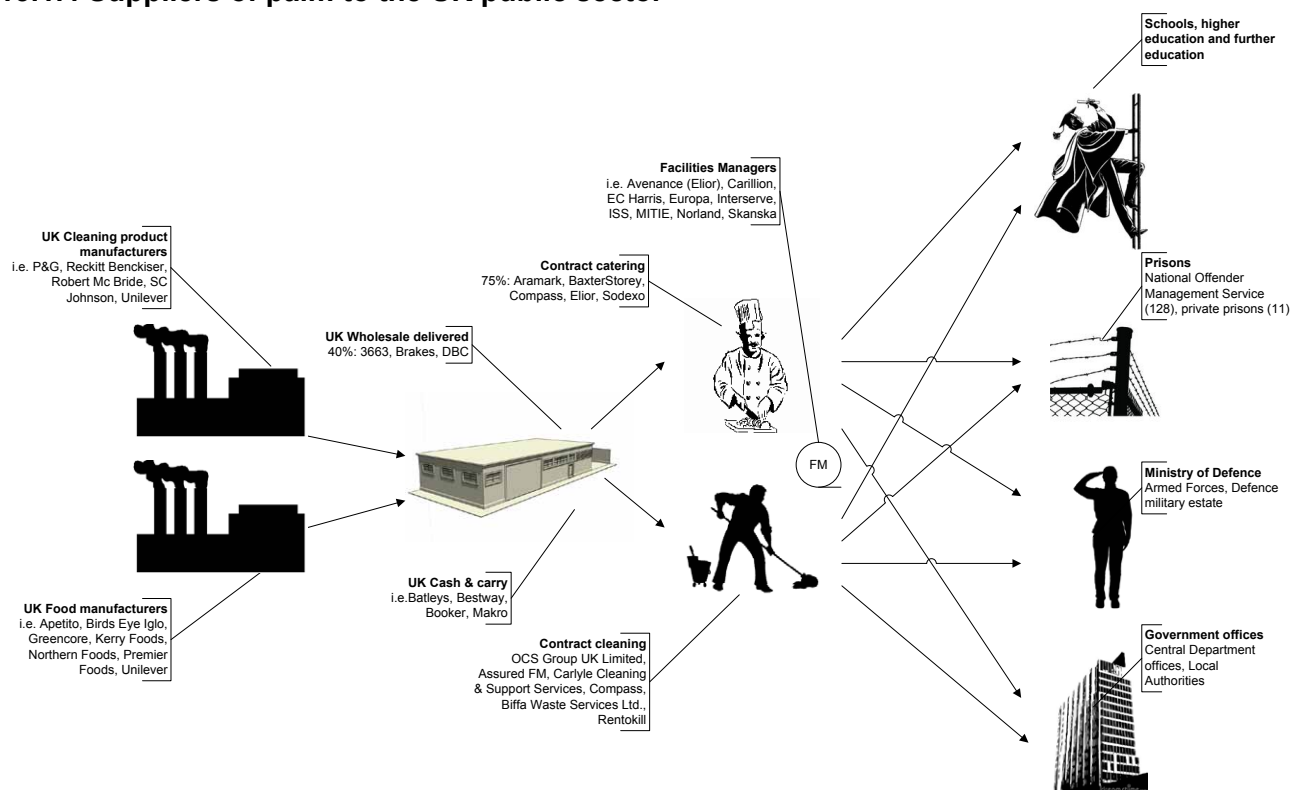


Figure 13.3: Structure of UK consumer supply chain with key players

Almost all of Central Government Departments, Agencies and Non-Departmental Public Bodies (NDPB) use Facilities Management contractors for cleaning, catering and other services . The Home Office, the NHS, MoD operations and prisons also have contracts for the direct supply of food (see Case Study below)<sup>553</sup>.

There are a number of players active in the provision of Facilities Management to the public sector, which sometimes provide direct services and procure food and cleaning products, however in many cases this will be subcontracted to specialised contract catering and cleaning companies.

Amey currently provide Facilities Management for the Department for Transport<sup>554</sup>, Ministry of Defence Whitehall offices as well as number of schools<sup>555</sup>.

Carillion estimates that the UK public sector represents 80% of its work<sup>556</sup>. Key public sector clients include the Health & Safety Executive, Forensic Science Services, HMP Brixton, and the Department for Culture Media & Sport<sup>557</sup>. Carillion is part of the Buying Solutions Facilities Management framework contract<sup>558</sup>.

EC Harris Solutions Ltd provides FM for the Department of Business Innovation and Skills (BIS)<sup>559</sup>. EC Harris is part of the Buying Solutions Facilities Management framework contract<sup>560</sup>.

Interserve provides Facilities Management for Defra<sup>561</sup>, including a number of core Executive Agencies<sup>iv</sup>, and are also part of the Environment Agency's framework contract<sup>562</sup>. They provide Facilities Management for the Foreign and Commonwealth Office (FCO)<sup>563</sup>, for the Office of National

<sup>iv</sup> Formerly known as Kalyx

<sup>vi</sup> This includes Animal Health, Central Science Laboratory, Centre for Environment, Fisheries & Aquaculture Science, Government Decontamination Services, Marine & Fisheries Agency, Regulatory Science Agency, Rural Payments Agency, Veterinary Laboratories Agency, Veterinary Medicines Directorate and Natural England

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Statistics (ONS)<sup>564</sup> and the Department of Health<sup>565</sup>. They also supply FM to a number of Local Authorities<sup>566</sup> and schools<sup>567 568</sup>, and service the health sector, predominately as part of PFI (and including design and construction), however a 40 year FM contract with the Dudley Group of Hospitals NHS Trust in the West Midlands including cleaning and catering<sup>569</sup>. Operating as MacLellan, Interserve has a cleaning contract with Her Majesty's Courts Service (HMCS) for the the service's London region<sup>570</sup>. Interserve is part of the Buying Solutions Facilities Management framework contract<sup>571</sup>.

There are additional examples including those currently part of the Buying Solutions Facilities Management framework agreement; Europa, ISS, MITIE, Norland and Skanska.

As outlined in Section 12 above, the five largest cost sector foodservice companies in the UK are the Compass Group, Sodexo, Elinor, Aramark and BaxterStorey. Several of these also offer FM services.

Aramark's Defence Services division has more than 45 contracts in 82 locations across the UK. In the education sector, they serve 130 locations across UK, including independent schools, colleges to universities and secondary schools. In the healthcare sector, they also serve around 130 sites<sup>572</sup>.

Avenance, part of Elinor UK, provides catering and facilities management services for 18,000 army personnel and the wider military community<sup>573</sup>. Avenance also provides contract catering in the health and education sectors, as well as to Government agencies such as the DVLA (as a sub-contractor to the DVLA PFI provider Telereal Trillium)<sup>574</sup>.

The Compass Group includes a number of subsidiaries such as Chartwells, Eurest, ESS, and Quadrant. Chartwells provides catering and support services to over 1,500 primary and 500 secondary schools throughout the UK<sup>575</sup>. Eurest is a contract caterer and provides services for the Welsh Assembly Government and the Northern Ireland Assembly<sup>576</sup>. ESS clients include the Ministry of Defence, the Foreign and Commonwealth Office, the Ministry of Justice, Her Majesty's Police Constabulary, the Royal Navy, the Army and the Royal Air Force. They also operate with business to business clients in PFI, PPP and Prime contractor business<sup>577</sup>. Quadrant provides contract catering to the Department of Health, as a contractor to Interserve<sup>578</sup>.

The Wilson Storey Halliday Group includes BaxterStorey, benugo, Cater Link, Holroyd Howe Independent and Portico. BaxterStorey has provided the staff catering, café and hospitality service at Defra as well as for the Department of Business Innovation and Skills<sup>579 580</sup>. Cater Link provides catering services to primary schools, secondary schools, colleges and universities<sup>581</sup> and Holroyd Howe Independent provides catering services to independent schools and colleges<sup>582</sup>.

Sodexo provides foodservice to the defence, education and healthcare sector as well as wider facilities management services<sup>583</sup>. It is estimated that they serve over 375 schools and universities, 54 hospitals and 150 defence sites<sup>584</sup>. They also operate private prisons (under the name Sodexo Justice Services)<sup>585</sup>.

There are many smaller contract caterers, which include for example Style (a sub-contractor to DfT FM contractor Amey), Rentokil Initial (serving the Department for Education through Autograph and the education sector through Eden branded services)<sup>586</sup>, Grayson's (catering to state schools through Duchy Catering<sup>587</sup> and one of the sub-contractors in the Buying Solutions FM contracts), ISS (serving schools, NHS and defence)<sup>588</sup>.

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Companies providing contract catering source from either wholesale delivered (with the main players in the UK being 3663 and Brakes and a smaller third player, DBC) as well as cash and carry outlets. In some cases, Central Government deals directly with wholesalers.

DBC, in partnership with a meat and poultry distributor and a Swiss-based foodservice company, operate Purple Foodservice Solutions, and deliver food to British armed forces around the world under contract for the Ministry of Defence<sup>589</sup>.

### **NOMS case study – Direct purchase of food**

The Ministry of Justice National Offenders Management Service (NOMS) operates 128 prisons, and provides catering for staff and prisoners as well as prison shops. There are two suppliers of food to public sector prisons that provide 98% of food requirements.

In April 2007, the Prison Service awarded two catering contracts worth around £128 million to 3663 and British Bakeries (part of Premier Foods). 3663 supplies fresh and chilled produce, breakfast and beverages groceries to prisons across England and Wales, while British Bakeries provides bread and morning goods.

Additionally, DHL supply chain and Booker Wholesale supply prison shops with about 1,000 product lines such as chocolates and shampoo.

This example of direct procurement of products by a public sector organisation means they have much greater control over the products procured, and the direct ability to influence the procurement of products which contain sustainable palm oil.

*Source: Caterer Search November 2008<sup>590</sup> and PSPI report 2010<sup>591</sup>*

Facilities Management providers also use contract cleaning companies, for example OCS Group UK Limited, Assured FM, Carlyle Cleaning & Support Services, Biffa Waste Services Ltd and Rentokill are examples of companies providing services to FM providers. The UK's largest supplier of janitorial, cleaning and hygiene products is Bunzl .

## **13.2 Public sector procurement mechanisms**

### **13.2.1 Framework contracts**

Framework contracts are agreements with suppliers, establishing the terms governing contracts to be awarded during a given period, in particular with regard to price and quantity. It sets out the general term for agreements with suppliers which set out terms and conditions under which specific purchases (call-offs) can be made throughout the term of the agreement.<sup>593</sup>

Buying Solutions<sup>lvii</sup> is the UK public services national procurement partner. They are the largest of the 40+ Professional Buying Organisations (PBO) in the wider UK public sector. They are the only PBO with a legal remit to trade across the whole of UK public services, and their customers include for example central government departments, NHS Trusts and local councils, through to the smallest schools<sup>594</sup>. Buying Solutions puts together framework contracts for 500,000 products and services delivered through more than 600 suppliers<sup>595</sup>. Buying Solutions framework agreements which are relevant to palm oil use include:

<sup>lvii</sup> The five regional PBOs are Central Buying Consortium (CBC), Eastern Shires Purchasing Organisation (ESPO), North Eastern Purchasing Organisation (NEPO), West Mercia Supplies (WMS), and Yorkshire Purchasing Organisation (YPO)

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- Facilities: Facilities Management – includes catering and cleaning
  - Facilities: Estates Consumables – includes paints, which may contain palm oil derivatives
  - Fuel: Supply of Liquid Fuels heating, marine and automotive fuels
  - Fuel: Supply of Liquid Fuels heating and automotive fuels for use of NHS
  - Fuel: Energy - Supply of Vehicle Lubricants and Associated Products

There have historically been framework contracts for vending machines and cleaning, but these are no longer in use.

There are five Regional Professional Buying Organisations, collective known as Pro5, which play a significant role in setting up frameworks for Local Governments and Community Organisations (and are involved in procurement for schools and care). Pro5 framework agreements which are relevant to palm oil use include:

- Sandwiches & Filled Bread Products (National)
- Bread and Morning Goods (National)
- Vending Services, Soft Drinks, Confectionery & Snacks (National)
- Vehicle Lubricating Oils, Greases & Antifreeze (Regional)
- Fats and Oils (under development)

There are also a number of Facilities Management frameworks which may include use of palm oil derivatives.

Framework contracts are important leverage points for sustainable procurement in the public sector. Including contract clauses that address sustainability aspects of products and services (such as sustainability of palm oil) can have a wide effect.

### 13.2.2 Government Buying Standards

Government Buying Standards are the main mechanism through which the UK Government implements sustainability requirements in their procurement of goods and services. Government Buying Standards are owned by Defra and are developed by a Cross-Government Stakeholder Group. Currently, the Buying Standards which are relevant for products which may contain palm oil are the Government Buying Standards for Food, and the Government Buying Standards for Cleaning products. There is currently no specific reference to sustainable palm oil.

The Government Buying Standards for Food and Catering are under development and scheduled to be introduced in March 2011. Guidance was issued at the end of January 2011 including a commitment that “All food supplied under a procurement contract controlled by a Central Government Department or executive agency, must be produced to UK production standards or equivalent, unless evidence is provided that this would result in an overall increase in costs”<sup>596</sup>. It covers primary commodity food that ‘can be and is commonly grown, reared or produced in the UK’. This would not include oil palm for example.



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This commitment will be part of the Government Buying Standard which is currently under development. The Standard will also include criteria covering

- Foods (and food commodities) produced to higher sustainability standards;
- Foods procured and served to higher nutritional standards, and;
- Procurement of catering operations (including equipment, energy and water use) to higher sustainability standards.

Sustainable food procurement is further defined in the guidance as a process whereby public authorities procure food, catering equipment and catering services that contribute to a healthy diet; support a thriving and competitive food industry; promote high animal health and welfare standards; and deliver improving environmental impact throughout the lifecycle of the product or service<sup>597</sup>. Currently, there is no specific reference to palm oil<sup>598</sup>.

Defra guidance additionally refers to the EU Green Public Procurement product sheet for catering & food<sup>599</sup>. It includes core criteria for a proportion of products to be organic, with comprehensive criteria relating to organic, integrated production systems, sustainable fishing of aquaculture, animal welfare and recycled packaging.

There is a Catering services and food procurement toolkit, which is designed to support implementation of the Buying Standards<sup>600</sup>.

The Government Buying Standards for Cleaning Products currently cover both laundry detergents and dishwasher detergents. New buying standards are currently under development and are scheduled for implementation starting in April<sup>601</sup>. The current mandatory requirements set minimum chemical content<sup>602</sup>. Defra also references the EU Green Public Procurement product sheet for cleaning products & services<sup>603</sup>. The GPP has core requirements for chemical content and packaging requirements (including requirements to use recycled sources for cardboard packaging), and comprehensive criteria for 'Purchase of environmentally friendly cleaning products' refers to the EU Ecolabel, which has requirements & restrictions for toxicity to aquatic organisms, biodegradability of surfactants, restrictions on content, packaging requirements, fitness for use and consumer requirements<sup>604</sup>.

The outcome of this palm oil mapping project will be taken into account in the next revision of the Government Buying Standards, and at that point it will be considered whether to include any specific provisions related to the sustainability of palm oil<sup>605</sup>. The GBS standards are revised regularly, and are mandatory for Central Government. Once finalised, GBS must be included in all new contracts.

### 13.2.3 Additional tools

In addition to the GBS, there is also a wider area of work related to sustainability of foods that Defra undertakes, including for example courses for procurers, where education about how to procure sustainable palm oil could be addressed<sup>606</sup>.

The Cabinet Office's Efficiency and Reform team have indicated they are working directly with 3663 and Brakes on issues related to sustainable food procurement<sup>607</sup>.

# 14. Conclusions

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## 14.1 Key Findings

This study was designed to identify the volumes of palm oil being used in the UK, where they are being used, and the supply chains they follow. The aim was to build up a picture that would facilitate discussions around potential policy options for the UK.

Understanding how far private sector commitments have taken the UK market to date will also help design approaches that can continue to support this momentum.

## 14.2 Current state of play

Out of the 643,400 mt of palm oil and fats imported, it is estimated that approximately 55,000 mt is RSPO certified (including 40,000 mt from UK refineries and 15,000 from European refineries). Furthermore, it is estimated that UK companies have purchased around 100,000 metric tons (mt) of GreenPalm certificates. Together this accounts for around 155,000 metric tons (mt) of RSPO palm oil, which is around 24% of current UK imports<sup>lix</sup>.

Progress towards securing sustainable supplies of palm oil and palm kernel oil is most advanced in the food sector, with around 33% of the volume covered. Cleaning and personal care has around 8% (mainly soap, with derivatives being a significant challenge).

A number of companies operating in the UK have made commitments to source sustainable palm oil, and research undertaken as part of this project suggests they have made good progress; those who shared data had collectively reached about 80% of their targets. If the 2015 target is met by these companies, it is expected that around 244,000 mt of the UK import of palm oil would be sustainable, which is equivalent to 37% of the total import, and over 40% of the estimated volumes used in the food sector. This includes an estimated 65,000 mt of palm oil used by retailers in their own-brand products.

These figures do not include the import of finished products. A significant proportion of finished products that contain palm oil are imported into the UK every year, estimated to be somewhere in the order of 190,000 - 350,000 mt, adding 30 – 50% on to the total use of palm oil in the UK. These are very rough estimates would require a much wider research programme to better understand the current state of play.

## 14.3 Critical leverage points

The points in the supply chain where there are the fewest operators handling the highest volumes can be considered critical leverage points.

- There are currently four refineries in the UK, one of which has an integrated supply chain back to RSPO certified supply chains, another which has recently been purchased by a company with oil palm plantation interests and a third that owns and operates the RSPO GreenPalm trading platform. Refined palm oil is also imported from a small number of vertically integrated companies, concentrated in the Netherlands.
- The food manufacturing industry is also highly consolidated, with much of the foods supplied to retailers and the service industry coming from a handful of players which in some cases control upwards of 80% of the market for specific food categories.

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<sup>lix</sup> These are mainly 2009 figures. The GreenPalm accounting 2010 year does not close until March 2011, and therefore 2010 number will not be available until after then. Where the 2010 number to date was higher than the 2009, the higher value was used.

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- For cleaning and personal care, whilst there are a few large players, they are being limited by the availability of palm derivatives such as surfactants, glycerine and emulsifiers from sustainable sources. In this case, the critical leverage points are the oleochemical manufacturers. Significant changes towards a sustainable palm supply may require changes in the way oleochemical derivatives are traded.
  - For the energy and biofuel sector, there are a limited number of fuel and energy companies operating in the UK. Global trading houses such as ADM, Bunge, Cargill, Dreyfus and Wilmar control much of the world's commodity flows.
  - The end users, including consumers of retail and foodservice, as well as public and private sector companies contracting catering and cleaning services have a role to play in terms of market signal, but the point at which the products are being formulated provides a much more direct influence. The specifiers are the retailers (for own-brand products), the wholesale delivered companies (who also have own-brand) and the manufacturers themselves.
  - The public sector, while a comparatively small consumer of palm oil, can use its mandatory Government Buying Standards and framework contracts as levers of change across the public sector.

While this research shows the UK is already on its way towards consumption of sustainable palm oil, there are still challenges that lie ahead. Identifying the opportunities for leveraging change in the supply chain, as detailed in this body of work, is an important step in moving the UK towards a situation where the palm oil and palm kernel meal used is sustainable.

## Annex A: UK importers of palm oil

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(UK Trade Info data, up to July 2010)

Company name	Sector/Type
Aarhuskarlshamn uk limited	Refining Food & personal care ingredients
ADM Erith Ltd	Refining
Bai Fonti Fofana	Individual
Britannia food	Refining Food ingredients
British Bakels limited	Food ingredients
Cecilia Antwi	Individual
Charles Kargbo	Individual
Comfort Agyekum	Individual
Dos Palm Oil Production Limited	Distributor
Fovitor international ltd	Food ingredients
Global Africa ltd	Cash & carry
Janet Brown	Individual
Jumbo UK ltd	Wholesalers
K T C (edibles) Limited	Oils and fats distribution
Korea Foods Company Limited	Wholesale/distribution
M & N Cash & Carry limited	Cash & carry
Macphilips foods ltd	Manufacturer
Mama Calabar Restaurant	Restaurant
Marac international	Unknown
New Directions Australia	Personal care ingredients
Nii Kwesi Company limited	Unknown
Olubukola Akin Lawal	Individual
Pura Foods limited	Refinery and food manufacture
Stephenson Group limited	Personal care ingredients (soap)
Swift Afro foods	Wholesaler
T & N Oils company ltd	Distributor
The Body Shop	Manufacturer/retailer
The Kerfoot Group limited	Food and cosmetics ingredients
Verona impex ltd	Unknown
Wanis ltd	Wholesaler
Whitman Laboratories (Estee Lauder)	Cosmetics
Yadly marketing company	Unknown
Yem yom ventures ltd	Wholesaler

## Annex B: RTFO Companies

Table 1. Obligated companies delivering > 450,000 L to the market (as of October 2010)

BP Oil UK Ltd	Morgan Stanley Capital Group Inc.
Chevron Ltd	Murco Petroleum Ltd
ConocoPhillips Ltd	Petroplus Refining Teesside Ltd
Esso Petroleum Company Ltd	Prax Petroleum Ltd
Greenenergy Fuels Ltd (biodiesel plant, Immingham)	Shell UK Ltd
Harvest Energy Ltd (biodiesel plant, Teesside)	Topaz Energy Ltd
Lissan Coal Company Ltd	Total UK Ltd
Mabanaft UK Ltd	INEOS

Table 2. UK biofuel companies (as of October 2010) <sup>608</sup>

Company	Main feedstocks
Argent Energy (UK) Ltd	Tallow and UCO
Associated British Bio-Fuels Ltd	By-product
Bio UK Fuels (Sheffield) Ltd	Waste oil
Biofuel Refineries Ltd	By-product
Biomotive Fuels Ltd	UCO
British Sugar Ltd	Sugarbeet
Convert2Green Ltd	Waste Oil
Doncaster Bio Fuels	By-product
Double Green Ltd	By-product
Ebony Solutions Ltd	By-product
Edible Oil Direct Ltd	By-product
Four Rivers Biofuels Ltd	Organic waste <sup>cdxlvii</sup>
Gasrec Ltd	Landfill and food manufacturing <sup>448</sup>
Goldenfuels	UCO <sup>449</sup>
Green Fuels Ltd	By-product
Greeneearth Biodiesel	UCO <sup>450</sup>
GreenerDiesel.com (UK) Ltd	By-product
GreenFuel Supply Solutions Ltd	No longer producing <sup>451</sup>
Greenolysis Ltd	UCO <sup>452</sup>
Kassero Edible Oils Ltd	By-product
Neal Environmental Ltd	Waste <sup>453</sup>
Ozone Friendly Fuels Ltd	By-product
Phoenix Fuels Ltd	Rapeseed <sup>454</sup>
Pilkington Oils Ltd	By-product
PRS Environmental	By-product
Pure Fuels Ltd	By-product
Rix Biodiesel	By-product
Rural Development Trust	By-product
Shepherds Bakery	By-product
UK Renewable Fuels Ltd	By-product
Uptown Oil Ltd	By-product
Veg Oil Motoring	By-product
Verdant Fuel Ltd	Rapeseed <sup>455</sup>
Wight Made Diesel	UCO <sup>456</sup>

Table 2. UK biofuel companies (as of October 2010)

<sup>1</sup> references to include

## Annex C: Company commitments

Company	Public commitment
Asda	All Asda brand products will use only sustainable palm oil by 2015.
Associated British Foods (including Jordans Ryvita, ABAgri, Allied Bakeries)	Have a groupwide commitment that all of their businesses use only Certified Sustainable palm oil, or Identity Preserved palm oil, by 2015 (provided that supply is available).
Body Shop	100% of all direct palm oil will be RSPO certified by 2011
Cadbury (Kraft)	Source 100% identity preserved 'blended' (fractionated) Palm Oil from 2012 onwards, and from January 2010 purchasing GreenPalm certificates to cover their volumes of palm oil in 2009
Colgate	All suppliers RSPO members by 2011.
Co-Op	The Co-operative Food has set a target that all suppliers that use palm oil and palm oil derived ingredients in Co-operative brand products must only use RSPO certified sustainable palm oil by 2015 at the latest.
Danisco	2015
Ferrero	In 2009 started buying RSPO certified sustainable palm oil and intends to progressively increase the quota of certified palm oil as its availability on the market becomes greater. To this end, a specific agreement was signed in October 2009 with New Britain Palm Oil Limited (NBPOL), which means 25% of their total supply of palm oil will be certified as sustainable starting from 2011.
J&J	Committed to sourcing all oleo-chemicals containing certified sustainable palm oil by 2015.
L'Oreal	Sources 100% of its CPO supplies from certified segregated sources. Calculating derivatives use.
McDonalds	Will source only RSPO-certified palm oil by 2015
Mars	Aim is to move to 100% RSPO certified palm oil, originating from sustainable sources by 2015.
Marks & Spencer	By 2015, they aim to use only 100% fully traceable, certified sustainable palm oil
Morrison's	Will work with their suppliers to ensure that 100% of the palm oil used in their own label products is sourced through a Roundtable for Sustainable Palm Oil (RSPO) recognised supply chain system by 2015.
Neste Oil	Neste Oil is committed to using solely certified palm oil as and when sufficient volumes become available. The company believes that this will be possible by the end of 2015 if the positive trend in certification continues.
Northern Foods	By January 2012 all palm oils and fats will be either RSPO GreenPalm or segregated
Palsgaard	All palm oil purchased by Palsgaard in certified sustainable by 2015
PepsiCo	Committed to purchase 100% certified sustainable palm oil (CSPO) in the production of our products by 2015
P&G	By 2015 they intend to purchase and use palm oil that we can confirm to have originated from responsible and sustainable sources.
Premier Foods	Premier Foods committed to source 100% certified sustainable Palm Oil (CSPO) by January 2010, which they report as having achieved.
Reckitt Benckiser	Committed to working with their suppliers and others in the industry to seek the world's major palm oil supplies being drawn from certified, sustainable sources by 2015.

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Company	Public commitment
Sainsbury	The first retailer to set a target date by which to switch to 100 per cent certified sustainable palm oil, aiming to reach this goal by 2014,
Shell	As part of their contract sustainability clauses, they require any supplier that wishes to supply palm oil to Shell to join the RSPO and comply with its principles and standards.
Tesco	Set a target of using 100% certified sustainable palm oil in all our products by 2015, and sourcing all our oil from an RSPO-certified system such as GreenPalm, by 2012.
Unilever	All Unilever's palm oil will be certified sustainable by 2015. They have pledged to have we have pledged to have fully traceable supply chains in place by 2012.
United Biscuits	Committed to 100% segregated CSPO by 2012.
Waitrose	Waitrose announced in December 2009 that it will use only Certified Sustainable Palm Oil (CSPO) in its own label products by the end of 2012 and will be using Greenpalm, as an interim measure for 100 per cent of their remaining products.



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