

The Greenhouse Gas Footprint of Booths

Summary report: June 2010

Introduction

Climate change represents one of the greatest challenges facing humanity. Despite the now well established scientific consensus, media coverage of the issues has remained stubbornly mixed. Nevertheless there are signs of steadily increasing sophistication of public understanding, resulting in a marked shift in consumer attitudes.

Food purchased from shops accounts for around 12% of the greenhouse gas footprint of all UK consumption. This figure rises to about 20% when the impact of shopping, cooking, emissions resulting from food waste and eating out are taken into account. If land use changes (primarily deforestation), are taken into account this figure becomes higher still.

Booths has been mapping out the climate change impacts of its operations and supply chains since 2007 and working systematically across the business to address its impacts.

This report summarises our assessment of Booths' carbon footprint and activities over the last 12 months to manage its impacts. The footprint covers the Booths operation and its products, looking right through the supply chains from farm production to the checkout. It includes all the greenhouse gases covered by the Kyoto agreement, and presents the results in kilograms of carbon dioxide equivalent (CO₂e).

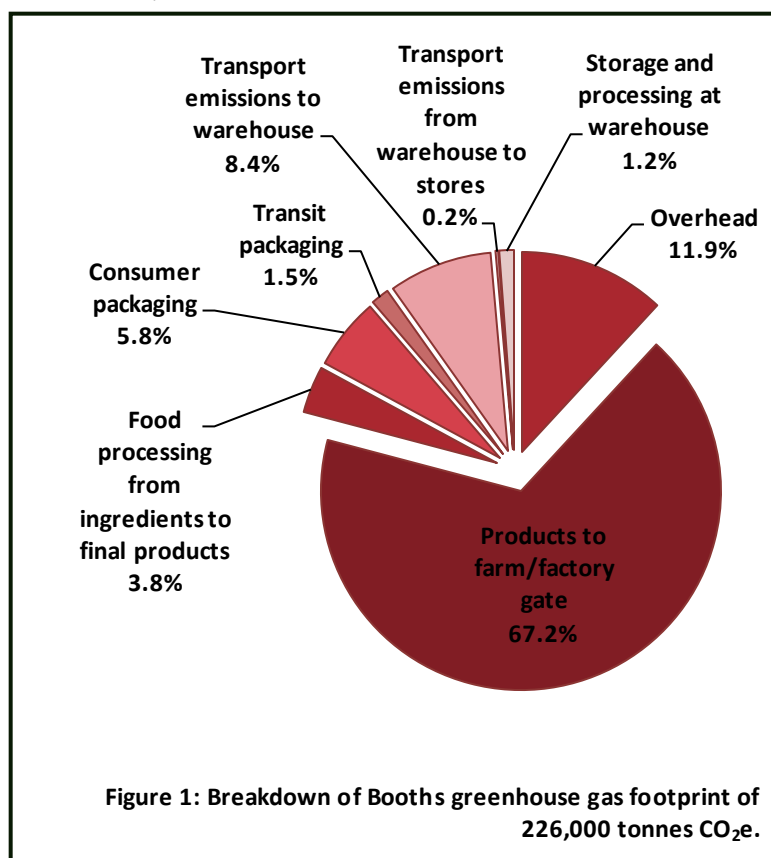
Booths' Carbon Footprint

The results presented here should be considered best estimates, around which considerable

uncertainty remains. Nevertheless we believe they offer a meaningful picture of the main issues, and provide an essential sense of scale.

The annual carbon footprint of Booths and its product supply chains is estimated at 226,000 tonnes CO₂e per year. To put this into perspective, this equates to a best estimate of 888g of CO₂e per £ spent by customers on the products covered in this study. That is roughly the same as the carbon footprint of one-and-a-half units of electricityⁱ or a one mile drive in a typical large petrol carⁱⁱ.

Primary production contributes 67% of the total, with nitrous oxide and methane emissions



both being more dominant than carbon dioxide.

The **‘overhead’** component includes stores, offices and staff transport. It accounts for 12% of the total footprint.

Transport accounts for 8.6% of the product-related footprint and road freight accounts for nearly two-thirds of this. 28% is attributable to the very small proportion of Booths products that travel by airⁱⁱⁱ and although the majority of food miles are by sea, shipping accounts for just 7% of the transport footprint.

Packaging accounts for 7.3% of the total footprint, with 78% of this being consumer packaging and the rest transit packaging. Carrier bags account for just 2% of the footprint of packaging; a little over one thousandth of the total footprint.

The Footprint of Products

14 broad product categories can be identified with broadly similar carbon characteristics. Comparison between the bars on Figure 2 provides a measure of the **carbon intensity** of each category: the greenhouse gas emissions per unit retail value.

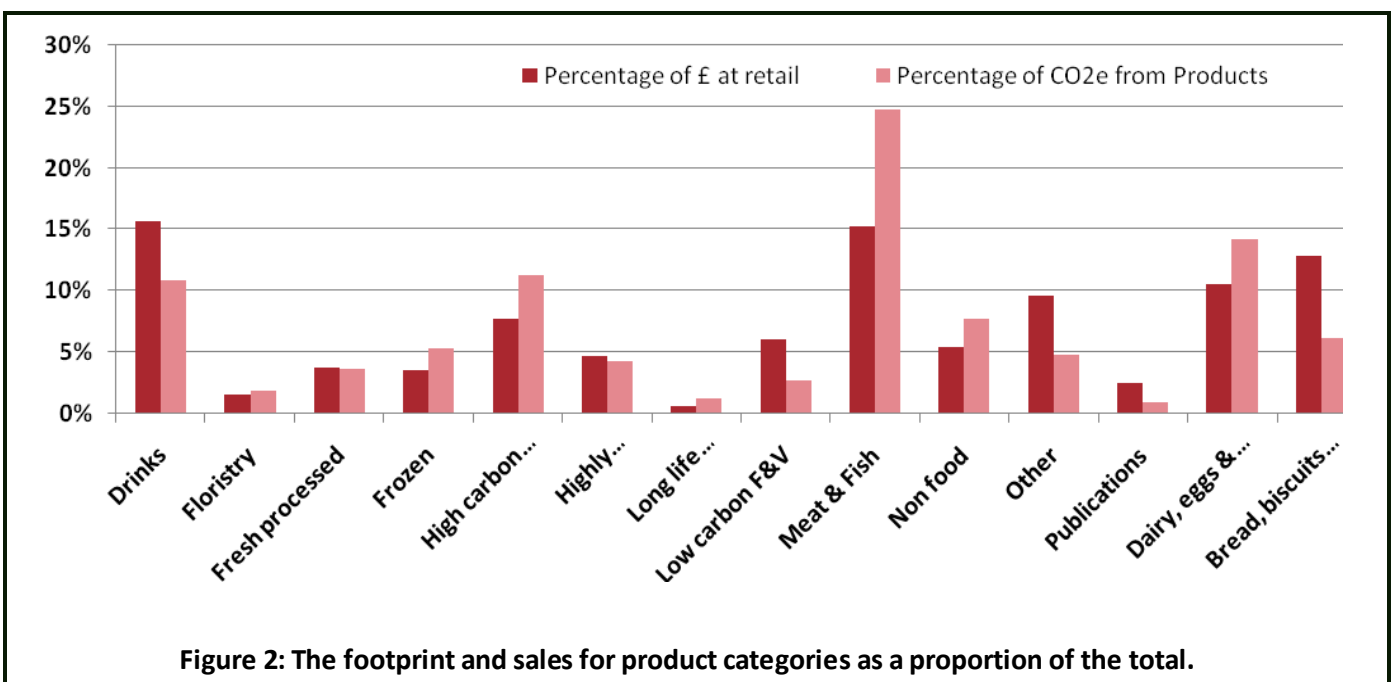
- The most emissions-intensive products include meat and dairy products (particularly beef, lamb and milk products where methane emissions from livestock are important). Also carbon-intensive are fruit, vegetables and cut flowers that have been air-freighted or grown using artificial heat or light.
- The least emissions-intensive products include cereal-based products and more standard fruit and vegetables (i.e. roots, potatoes, apples and bananas) regardless of country of origin, provided they are not flown or hot-housed.

Meat and fish

This is fairly high-carbon per pound retail value and even higher carbon per kilogram of product. Beef and lamb (the ruminants) appear as the most carbon-intensive meats per kilogram, followed by bacon, with poultry and most fish at the lower end of the spectrum.

Dairy, eggs and fats

This category is roughly as carbon-intensive as meat and fish. There appears to be little or no carbon advantage in swapping meat for dairy produce in our diet.



‘High-carbon’ and ‘Low-carbon’ fruit and vegetables^{iv}.

There is a marked contrast between these two categories. The high-carbon category includes some of the most carbon-intensive products on the Booths shelves. Air freight is the dominant factor here, although growing under artificial conditions is also very carbon-intensive.

Within the low-carbon category are standard items such as potatoes, root vegetables, apples, oranges and bananas, grown in a natural climate and not transported by air. Note that the impact of shipping is a small consideration, even if the distances are large.

Floristry

This category contains a few very carbon-intensive products and was the focus of a mini-report we compiled for Booths in 2009, summarized here.

- We believe that around 26% of Booths’ flowers (by value) are grown in season in the UK without requiring artificial heat. This is the lowest carbon option. Around 6% are grown in other parts of Europe in season (Holland, Italy, Germany) and are transported by road. This is also a fairly low-carbon option.
- Approximately 18% are imported by air, mainly from Kenya, with some from Israel and Columbia.
- Around 50% are grown in artificially heated greenhouses, mainly in Holland. This is almost certainly the most carbon-intensive option. One study by Cranfield University^v estimated that the footprint of a single cut rose from the Netherlands had a footprint of 3.2 kg CO₂e. The same study estimated that the footprint could be cut by a factor of six by importing by air from Kenya.

All commercial cut flowers raise further sustainability issues which deserve consideration alongside carbon and commercial issues:

- Using land for flowers increases pressure on land for forests and crops.
- In developing countries flowers can provide important revenue, yet typically only a small proportion of this is seen by the workers, furthermore growers can be subjected to health and safety hazards, especially through contact with chemicals such as fungicides and pesticides.
- Floriculture can be the cause of pollution and depletion of water supplies.

Carbon Management Actions

Over the last year, Booths has been working across the business to identify and implement practical steps to manage its climate change impact and to engage customers and staff. The approach has been to target the carbon footprint hotspots and to identify actions that add value to the business when viewed from wide ranging assessment criteria:

- climate change impact,
- other sustainability criteria,
- meeting customer expectations,
- operational implications,
- direct costs and savings,
- implications for staff.

A comprehensive list of actions has been identified, spanning every department. If implemented they will result in encouragingly significant annual savings, estimated at around 5% of the total footprint.

Waste reduction

The carbon savings estimated at 678 tonnes CO₂e will be achieved if a major initiative to cut waste and markdowns from 2.8% to 2% is successful.

Efficient refrigeration

Annual carbon savings of 8,400 tonnes per year are envisaged from a series of planned improvements; most notably the almost complete switch to CO₂ based refrigeration systems by 2020

and the fitting of heat recovery systems in many stores over the next 4 years. In the shorter terms we estimate that the fitting and repair of night blinds on fridges could save 540 tonnes CO₂e per year.

Distribution efficiencies

A concerted effort, including acting on advice from distribution consultants and working with Lancaster University logistics researchers, has led to an impressive set of actions, mostly already underway, and which, if fully implemented, will lead to annual savings estimated at 650 tonnes CO₂e.

Actions include improved route planning, rationalisation of delivery schedules to stores, reducing the numbers of vehicles, training in fuel-efficient driving and increasing 'back-hauling' (making use of the return journeys for freight deliveries).

Packaging

A planned 15% reduction in own label packaging will lead to a relatively small but worthwhile reduction in the footprint (0.05%) in line with common practice.

Product sourcing

Booths is currently looking to find practical improvements in its product sourcing, focusing in the first instance on fruit, vegetables and horticulture.

- Prepared fruit is typically already shipped and prepared in the UK. This compares very favourably with the industry norm of preparing overseas and then flying the product.
- The UK asparagus season has been extended by two weeks with further extension planned. Similar action is planned for spring onions and chillies.
- Over recent years sourcing strawberries from California has stopped, with the furthest field product now coming from Egypt.

Other actions prioritised for consideration are:

- freighting all citrus fruit by sea and road,
- shifting to late planted cucumbers and tomatoes to avoid hot housing,
- avoiding the air freight of soft fruit that typically takes place for two weeks before the season starts,
- sourcing vegetables from North Africa rather than South.

Meat and dairy supply chains

This is a complex but important area in which the science is poorly understood and sometimes conflicting. It is clear, however, that meat and dairy products make a large contribution to the greenhouse gas footprint of the UK diet. We are seeking opportunities to collaborate with suppliers on practical mitigation actions.

Staff engagement

A series of events have been carried out to engage staff in the carbon agenda. Interest of attendees has been encouraging and has resulted in over new 100 carbon management ideas, several of which have been implemented.

External communication

The publication of this report marks the first step in public communication of Booths' carbon management actions. Careful consideration is being paid to customer messages. The emphasis on seasonality has been increased and a commitment made to increase the number of vegetarian options in our published recipe programs.

Other actions

Across the rest of operations there are numerous smaller but useful actions being identified and implemented. A series of smaller, more immediate actions stand to deliver annual savings of around 35 tonnes CO₂e .

This report was prepared by Small World Consulting Ltd, June 2010.

A more detailed version can also be downloaded from the Booths Website.

Notes

ⁱ UK grid electricity, based on 0.6 kg CO₂e per kWh. This figure takes into account the supply chains of power stations as well as their direct emissions.

ⁱⁱ This figure takes into account exhaust pipe emissions, carbon incorporated in the supply chains of fuel production and distribution, and the embodied emissions in the car itself. Exhaust pipe emissions make up around 50% of the total.

ⁱⁱⁱ An emissions weighting factor of 1.9 has been used to take account of the higher impact of high altitude emissions.

^{iv} 'High-carbon fruit and vegetables' is roughly defined as all those that have been hot housed or flown. 'Low-carbon fruit and vegetables' includes all others except frozen.

^v William, A. (2007) 'Comparative Study of Cut Roses for the British Market Produced in Kenya and the Netherlands'. Précis Report for World Flowers; Cranfield University.