UK TRADE & INVESTMENT

CHAIN REACTION:
THE LOW CARBON CHALLENGE FOR THE FOOD INDUSTRY

CHAIN REACTION

The food industry is one of the most carbon-intensive in the world, prompting many companies in the sector to look at measures designed to reduce the carbon footprint in their supply chain. But how effective are these practices at improving efficiencies and margins? This paper, produced by UK Trade & Investment, in co-operation with the Economist Intelligence Unit, examines the emerging trends.

Pick up a packet of Walkers crisps, and in addition to information about the weight, nutritional value and sell-by date, there is a small logo in the bottom right-hand corner of the packet quantifying something extra – the amount of carbon dioxide generated by the production of that packet of crisps.

What surprised the company, owned by US-based PepsiCo, when it finished calculating this carbon footprint, was which portion of the crisps' lifecycle generated the biggest chunk of carbon emissions. More than one-half came from something for which Walkers was not directly responsible, namely agriculture (the process involved in growing the potatoes and the sunflowers that make the oil in which the crisps are cooked).

The Walkers exercise – conducted with the Carbon Trust, a UK government-funded environmental consultancy – has certainly changed the company's approach to managing its environmental impact. "From a sustainability perspective, Walkers doesn't describe itself as a food company – it now describes itself as an agriculture company," says Euan Murray, general manager of carbon footprint at the Carbon Trust.

Back to basics

As food firms start to look more closely at their impact on the environment, it is clear that they need to start addressing the carbon emissions associated with their products that are generated outside their own four walls.

Doing so will not be easy, however. Food supply chains are among the world's longest and most complex, a fact that was graphically illustrated by a 1993 study in which Stefanie Böge, a researcher at the Wuppertal Institute, traced on a map of Germany the lifecycle of a pot of strawberry yogurt. This included everything from ingredients, such as milk, jam and sugar, to the glass container, the paper label, the glue pasting it to the pot and the foil top. Her map ended up covered in a dense mesh of lines (today, she would have to trace her lines far outside German borders).

Food supply chains encompass everything from giant agribusinesses and food processors to dairy farmers and smallholder producers in developing countries. Moreover, food can be many things – from a raw commodity to a processed product or a meal. It is unsurprising, therefore, that food companies thinking about cutting carbon emissions might well wonder where to begin.

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Cutting emissions

One starting point is for food companies to clean up their own operations and the emissions for which they are directly responsible. The most obvious target is the energy consumed by transport. Here, running fewer empty trucks cuts at least some of the wasted energy of the global logistics system (in Europe, about 30 per cent of trucks still run empty).

Other measures can make an impact on transportation emissions, too. In the UK, at Asda, a supermarket chain owned by Wal-Mart, a US retailer, the introduction of 246 double-decker trailers has cut more than five million miles from its journeys, saving the company 354,000 litres of fuel a year and simultaneously slimming down the carbon footprint of its transport operations.

Energy-efficiency measures in the stores, warehouses and processing plants of supermarkets and other retailers have a similar impact on the bottom line, resulting in lower energy bills.

"Retailers and brand manufacturers, who are big employers and have large facilities and stores, have their own carbon footprint," says Chris Anstey, a food industry consultant and former executive at Tesco, a UK supermarket giant. "There has been a massive effort [to cut that] across their own operations-and that's all to do with driving efficiency."

The measures taken by Wal-Mart in its stores, for example, include using skylights to bring in more daylight. This has resulted in savings of about 250 million kilowatts a year, which the company estimates would power roughly 23,000 homes.

At Pineham, a facility of a UK supermarket giant, Sainsbury, in Northampton, a shed complex of more than 600,000 square feet has been equipped with a combined heat and cooling plant that uses surplus heat to power the refrigeration plant.

Tip of the iceberg

While a good start, these initiatives result in only slightly trimming a food company's overall carbon footprint. In the transport sector, for example, although much has been made of the carbon emissions associated with "food miles", this turns out to represent only a small portion of food's carbon footprint.

In a study of lamb, for example, New Zealand's Lincoln University found that, taking into account everything from farm buildings to production of animal feed, New Zealand lamb eaten in London was more energy-efficient than the British equivalent – even with the shipping fuel included. And for food retailers, the emissions generated by their stores represent just 5 per cent to 20 per cent of the total, according to a recent report by RiskMetrics Group, a consultancy.

However, if arguments for a lifecycle approach to carbon reduction are gaining momentum, evidence that food companies are taking this approach is mixed. For now, much of their carbon reduction activities remain limited to their own sphere of activity.

"In the US, companies are really still looking at their own operations," says Linda-Eling Lee, a senior analyst at RiskMetrics. "But European manufacturers are moving beyond that. The best companies are the ones that are going further back in the supply chain."

Consumer awareness

Elsewhere, while some companies are tackling energy efficiency in their stores, little evidence of lifecycle carbon reduction programmes is evident among food companies. "There are some in Asia, but the bulk of them are in Europe and the US," says Ms Lee.

This may be partly because of lower consumer awareness of sustainability issues. According to a Nielsen survey commissioned last year by the Asian Food Information Centre, few Asian consumers are familiar with the concept of sustainable food production. Less than 10 per cent of the respondents in China, India, South Korea and Japan said that they had heard much about it.

However, Aeon, a Japanese supermarket chain, has started to look at its carbon footprint. As well as developing eco-stores, such as its Aeon Lake Town store, which has energy-efficient equipment designed to reduce emissions by 20 per cent, the company has recently launched a labelling initiative measuring the carbon emissions produced over the lifecycle of its products, beginning with its rice.

But if companies are looking to reduce their carbon emissions all the way down the supply chain, they also need to consider non-food elements. For some, it is the packaging that contributes most to the carbon footprint of products. This is the case for Coca-Cola, for which packaging accounts for between 30 per cent and 70 per cent, depending on the type of container used. The company has found that increasing the recycled content of its packaging and encouraging consumers to recycle can lower this footprint by up to 60 per cent.

For other companies, however, focusing purely on packaging would miss the point. "For Coca-Cola, on the one hand, packaging is a big part of the carbon footprint, but if we go back to the Walkers example, packaging is less than a third," says Mr Murray.

With food companies, the emphasis needs to be on looking at what happens to their products long before they have reached the store or processing facility. "Examining their carbon footprint is forcing them to change how they think about their products and to learn more about what goes on back on the farm," says Mr Murray.

However, rolling out carbon reduction strategies across complex global supply chains is not always easy. While Sainsbury's and Wal-Mart have made progress in measuring and reducing the greenhouse gases generated throughout their dairy supply chains, the suppliers they are dealing with are domestic farmers.

Other companies, such as Kraft, a US food manufacturer, may count tens of thousands of smallholder coffee and cocoa farmers in Africa among their suppliers. "And it's hard to ask a Ghanaian farmer what his carbon footprint is," says Mr Murray.

However, he argues that, approached in the right way, much can be achieved by working with smallholder suppliers to maximise resources and boost crop yields through intercropping, rain-fed irrigation or use of cow manure as fertiliser. "It's all pretty basic agronomy", he says. "Yet it helps the farmers to become more efficient and reduces their carbon footprint."

Financial gains

Whether working with African smallholders or domestic dairy farmers, re-examining the supply chain from a carbon footprint perspective brings financial and efficiency gains, too. Quaker Oats, for example, has started reusing husks as a fuel source to drive the factory itself, cutting its emissions and its energy costs.

In the production of dairy products such as sour cream, Wal-Mart – which is working with suppliers to tighten up transport logistics, turn bovine methane into electricity and cut water and electricity consumption in the pasteurisation process, hopes to save US$250 million a year as a result.

After the Carbon Trust's work with Walkers – which included upgrading the burners used to heat cooking oil, moving more trucks full rather than empty and helping potato farmers to use energy more efficiently – the company cut the carbon footprint of its crisps by 7 per cent but also saved £400,000 over two years.

A retailer may run a fleet of trucks and have many warehouses and stores, which can add up to a sizeable carbon footprint, yet this is only likely to represent a tiny fraction of the carbon footprint of all the food it sells. And while Walkers and other companies may be looking beyond their own operations and further into the supply chain for sources of carbon emissions (and cost savings), the overriding question is how many companies will make the investments needed to address the full lifecycle footprint of their products.

CASE STUDY
SAINSBURY'S MILK

A decade ago, some might have laughed if a request had been made for an assessment of the carbon footprint of a cow. However, animals produce methane, a greenhouse gas more potent than carbon dioxide. In fact, including emissions from the land needed to rear them, livestock generate more emissions than the world's transport systems.

With this in mind, Sainsbury's has been measuring the carbon footprint of the more than 300 dairy farms that supply the company. To do so, it has worked with AB Sustain, a consultancy that is part of Associated British Agriculture, to measure everything from the animal feeds to fertilisers and manure. The Carbon Trust has certified the farms.

The biggest challenge for the company was getting round to visit all 325 farmers and then persuading them to change the way they thought about their operations, explains Annie Graham, head of brand sustainability and agriculture at Sainsbury's.

"Farmers have historically associated regulation from governments and businesses with increased costs," she says. "So they were initially very reluctant to engage with us, as they assumed it would be more of the same."

However, these attitudes changed once the farmers were able to see the financial gains of implementing the measures. One farmer saved 17 per cent on the costs of heating water by putting in better-insulated water tanks, cut fuel use by 44 per cent year on year by investing in a more fuel-efficient tractor and reduced the use of artificial fertiliser by 15 per cent.

"We have been able to demonstrate that being 'green' can actually save them money," confirms Ms Graham.

Published February 2010 by UK Trade & Investment

URN 10/640