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**Looking up, looking down:  
Responsibilities for Climate Change  
in the UK Food Supply Chains**



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and  
Andrew Flynn



## About the BRASS Centre

In 2001, Cardiff University won £3.1 million in research funds from the Economic and Social Research Council to develop a Research Centre for Business Relationships, Accountability, Sustainability and Society (BRASS). The Centre is a joint venture between the University's Schools of Business, City & Regional Planning and Law. It brings together the three Schools' existing research expertise on issues of sustainability, business ethics, company law, corporate reporting and business communication.

The Centre started work in October 2001 under the leadership of Professor Ken Peattie of the Business School, Professor Terry Marsden of the Department of City and Regional Planning and Professor Bob Lee of the Law School. The funding of the Centre covers an initial five-year period, but this should just mark the beginning of BRASS' contribution to creating more sustainable and responsible businesses locally, nationally and globally.

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# **Looking up, looking down: responsibilities for climate change in the UK food supply chains**

**Samarthia Thankappan and Andrew Flynn**

## **Abstract**

Given the historical sensitivity of agriculture to climate, the uncertainty which exists and the economic and social importance of this sector, there is a strong need to improve our understanding of climate change impacts and the adaptability of the agri-food sector to these changes. Any impact of climate change on the environmental, economic or social aspect of a consumption or production activity will influence the impacts created by business. Developing a better understanding of this interconnectedness therefore becomes paramount. This paper explores how different actors along the food supply chain conceptualise climate change in the UK and what changes (both technology and behaviour oriented) are envisaged by the various actors in food and farming and the supply chain.

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## 1.0 Introduction

In coming decades the food system faces many challenges. These include feeding growing global populations, land degradation, and loss of cropland to urbanisation (IPCC, 2001). Although food production has been able to keep pace with population growth on the global scale, there are serious regional deficits, and poverty related nutritional deficiencies affecting nearly a billion people globally (Fischer *et al.*, 2002). To this mix must be added climate change which could affect food production and availability in many parts of the world, particularly those most prone to drought and famine. Moreover, attempts to adapt to climate change, combined with strategies to mitigate the level of Greenhouse Gas (GHG) emissions, and peak oil are likely to have particularly profound effects on the food system (Brown, 2003). This is because the food system is a major energy user, with large amounts of carbon-based fuel being used in agriculture, food processing, distribution and storage.

The potentially wide-ranging consequences of climate change on food production and consumption practices mean that at a conceptual level it is important to adopt a system-level perspective. The dependencies in the food chain between, for example, between production and manufacturing, mean that climate change effects will not be isolated or confined to one element of the system. So, for instance, whilst much attention has been devoted to portraying land use modifications resulting from climate change and what this might mean for food production, it is only a partial picture. It is also important to analyse the way in which other actors in the food system will respond to climate change. For instance, if food supplies in one region are becoming more risk prone how will food manufacturers and retailers, who have global sourcing strategies, seek to manage such a situation? Similarly key actors within the food system, such as producers, manufacturers, retailers and consumers will face a range of policy, legislative and voluntary pressures in relation to climate change. In some cases these pressures (or opportunities) may be narrow and confined to one part of the food system but in many cases there will be 'spillover', such that change in one part of the food system has knock on effects upstream and/or downstream. Again, at an analytical level, it is important to assess whether key

actors have recognised the climate change dependencies within the food system and how they might seek to manage them.

Our perspective is informed by the work that we have undertaken to analyse the changing patterns of regulation in relation to food safety and quality in the UK and Europe more generally (see for example Marsden et al 2000, Smith et al 2004 and Thankappan et al 2004). Here we have shown how traditional public (state) interests in food quality have largely been superseded by private (corporate) sector interests. One of the most remarkable features of the contemporary food system has been the ability of major private sector interests, notably in the food manufacturing/processing and retail ends of the system to 'manage' their supply chains to deliver on their food quality objectives and at the same time meet public policy objectives. In practice, public food safety standards operate as a baseline, are enforced on a geographical basis and largely apply to the numerous small independent food manufacturers and retailers. Meanwhile, the major economic actors regulate their own supply chains to their own (higher) standards and transcend traditional geographical regulatory boundaries. The growth of private interest regulation has been accompanied by policy rhetoric around 'farm to fork' food safety.

Key research questions that now emerge are: can the private interest model of food safety regulation be transferred to climate change adaptation and mitigation, so that the private sector plays a lead role in delivering on public policy? Have food and environmental regulators recognised the challenges of climate change and its implications for the food system, rather than individual elements within it? Do key economic actors within the food system seek to manage their own environmental impacts or adopt a broader system management perspective? In this working paper we seek to provide some preliminary answers to these questions. In the following section we briefly outline the nature of climate change, the UK policy context and point to the significant contributions of the food and drink sector to energy use. Section three outlines the aims and objectives behind this study to enable us to improve our understanding of climate change impacts and the adaptability of the agri-food sector to various changes; the methodology adopted in this study is discussed in detail in section four. In section five of this paper, we discuss in

detail, who, in the food supply chain is responsible for tackling climate change issues that arise in the sector. A number of retailers have set themselves CO2 reduction targets; section six illustrates some of the initiatives that retailers and manufacturers are taking towards tackling climate change issues in the food sector. Across most countries and sectors, businesses are assessing their approach to non financial business issues. There has been a shift from issues relating to sustainable development, followed by corporate Social Responsibility/Corporate Governance etc. and now it is climate change that is setting the agenda, Section seven discusses these issues of how the goalposts have moved. The final section of this paper draws in the conclusion of this study highlighting the fact that while there are small number of climate-aware companies already showing high level of awareness regarding climate change issues and disseminating this along the supply chain, there is a much larger group of actors for whom the process is yet to begin.

## **2.0 Climate change, policy and the food and drink sector**

The science behind climate change, although complex and evolving, rests on three basic principles. First, concentrations of carbon dioxide and other Green House Gases (GHGs) have increased on average about 30 percent above pre-industrial concentrations. Second, temperatures at the Earth's surface are warming and have shown a small, but significant, increase. Third, the build-up of GHGs and the rise in surface temperature are due in part to human activities that release carbon dioxide and other GHGs previously stored in the earth. These activities are primarily in the form of burning fossil fuels for energy production, manufacturing, transportation, and other uses, adding to an increase in GHG concentrations above what might otherwise occur naturally. About 82 percent of all man-made GHG emissions are in the form of the carbon dioxide that is created by burning fuels to generate electricity and power vehicles. The remaining GHGs include nitrous oxide, methane, and other fluorinated gases (e.g., hydrofluorocarbons HFC, Perfluorocarbons PFC and sulfur hexafluoride) produced by agriculture, wastes, and industrial processes.

The global consequences of climate change, some of which we are already witnessing, threaten to both disrupt natural ecosystem functions and jeopardise the natural capital that

provides the economy's resource base. Climate change will have a significant effect (either positive or negative) on most businesses, even if they are not directly affected by environmental factors.

Climate change moved to the forefront of international environmental politics with the signing of the Kyoto Protocol in 1997. Industrialized nations including the European Union and Japan (but not the USA) approved a plan to cut emissions of gases linked to global warming to 5.2 percent below 1990 levels by 2012. The UK, however, has set itself more stringent targets and is committed to reducing its 1990 greenhouse gas emissions by 12.5% by 2010 (and is on course to do so). At the 2001 General Election a stronger manifesto commitment was made to cut carbon dioxide emissions by 20% by 2010. This commitment was later reduced to an aspiration (and looks unlikely to be met) and the target now is to achieve a 60% reduction by 2050. The latter headline target is now likely to gain legal force as it is enshrined in the Government's Climate Bill.

Debates on climate change and energy policy send out numerous mixed messages. Whilst the science of climate change has become ever more certain, governments across the globe have found that tackling the causes of climate change have questioned the basis of fundamental policies and the behaviour of consumers, and thus policies may have high political costs. A consumption-oriented food system may find the challenges of climate change particularly demanding (Schellnhuber et al 2006). For instance, foods are sourced globally, rely on energy intensive storage, and are increasingly consumed as processed or ready meals. At the outset, therefore, it is important to recognise how significant energy use is within the food sector. Too often the energy and climate change impacts of the food sector have been minimised by concentrating analysis upon particular activities in the food chain (for example, production).

The food and drink manufacturing industry plays a leading role in the UK economy. Over the last decade it has been the largest manufacturing sector with sales currently of £66bn; in 2004 UK food and drink exports totalled nearly £9.7bn. The industry employs approximately 0.5 million people directly, 3.4 million when taking into account the whole

food chain and ancillary industries. The industry uses energy totalling some 44.8 TWh making it the second largest in the industrial sector in terms of energy usage accounting for 11.3% of industrial energy consumption (UK Trade and Investment, 2006). Reducing associated carbon dioxide emissions from the sector is a key objective of the Food Industry Sustainability Strategy (Defra 2006).

Two recent studies, however, highlight that once the food system is analysed as a whole, by focusing on consumption, then the food industry emerges as a major user of energy and contributor to climate change. According to the analysis of environmental impact by final consumption category carried out for the EIPRO project (Tukker et al 2005.), consumption and production of food, drink tobacco (and drugs) in the European Union (EU) account for:

- 31% of Europe's global warming & acidification impacts
- 60% of its eutrophication<sup>1</sup> impacts
- 27% of its photochemical ozone creation potential<sup>2</sup>
- 22% of its abiotic resource depletion and
- 19% of its total expenditure

Similarly, in a recent report from the Carbon Trust (2006) carbon emissions in the UK were linked to consumption activities (see Figure 1 below) and food and catering emerge as the third most significant element.

Figure 1 shows that much of the carbon in food and catering is embodied in the product rather than in the act of consumption itself. A key question, therefore, is what are the activities within the food system that create such embodied energy within the product? In order to answer this question our analysis, based on an understanding of the way in which the food system operates, in which we can link together political, economic and regulatory issues along the supply chain, is crucial.

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<sup>1</sup> Eutrophication is the process of nutrient enrichment in the water environment. See glossary for further information

<sup>2</sup> Photochemical ozone creation potential is a measure of emissions from a system of substances that contribute to the formation of low-level atmospheric ozone and hence to poor air quality

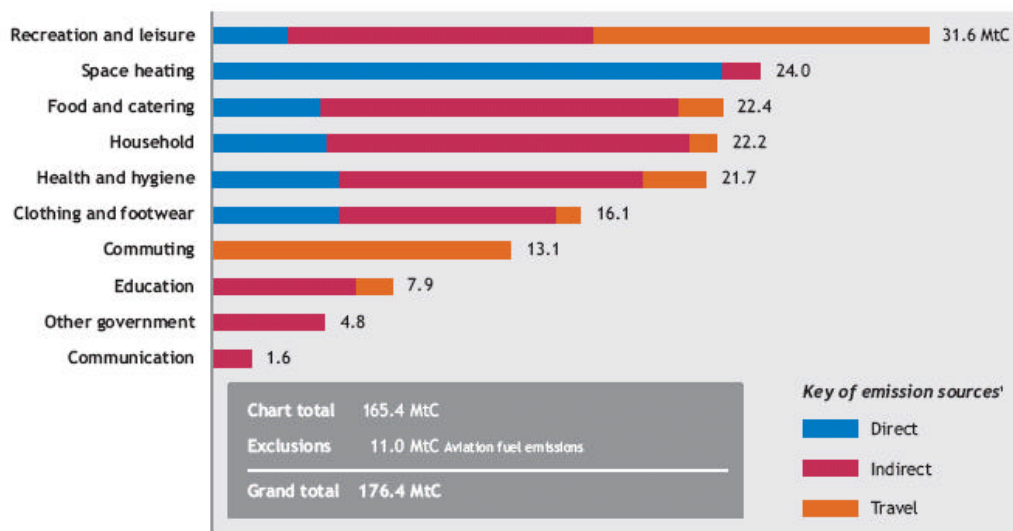
The importance of undertaking analysis of foods and linking them to their food chains has been emphasised by Green et al (2006). In a review for DEFRA of the environmental impacts of food consumption, they make it clear that there is a dearth of data:

*“[Our] review of the evidence has made it clear that environmental impacts arising across the entire life-cycle (including consumer activities and waste disposal) have been studied in detail for very few basic foods and even fewer processed foods. The bulk of the research that has been carried out has focused on primary production, sometimes extended to cover processing.”*

They add:

*“few studies cover the entire ‘farm to fork’ life cycle; there is a strong leaning to the ‘farm’ end, with a preponderance of analyses of the environmental impacts of agricultural production, ending at the farm gate.”*

**Figure 1 Emissions by consumer need**



Source: UK Carbon Attribution Model, Centre for Environmental Strategy, University of Surrey, 2005

Source: Carbon Trust (2006)

### **3.0 Scope, aims and objectives**

There are a number of national and international organisations carrying out research on climate change issues. For example the Tyndall research centre focuses on issues like informing international climate policy; researching on pathways to global decarbonisation; identifying the limits and thresholds in adaptation that affect resilience to climate change and how shorelines can be managed for the third millennium etc. To date, however, little work has been undertaken at the sectoral level, especially of the agri-food sector.

Given the historical sensitivity of the agricultural industry to modifications in climate, the uncertainty which exists and the economic and social importance of this sector, there is a strong need to improve our understanding of climate change impacts and the adaptability of the agri-food sector to these changes. Climate change will undoubtedly shape the environmental, economic and social aspects of consumption and production, and in turn these activities contribute to (or can mitigate) climate change. Some idea of the way in which consumers perceptions may influence their climate change behaviour is to be found in a recent report (Defra 2006) which found that few people understand what is actually causing climate change. Barely half of the population think they will be directly affected. Climate change was ranked bottom of a list of key challenges facing the UK in a recent survey. Most people in the UK think that climate change:

- is confusing
- they can't see how it relates to them;
- won't affect them personally;
- is a problem for the future, not now; and
- can't be affected by their individual actions, because the problem is so big.

The implications therefore these views have for the food industry is that businesses need to do much more to incorporate environmental concerns into their thinking. Consumers too can exert pressure. A report by the Co-operative Bank found that one-third of UK consumers boycotted at least one product in 2005 for ethical reasons. Many people have

no real way of knowing which changes to their daily lives would be most environmentally effective. Concerted action from government, NGOs and business and the general public can together solve this problem.

A report prepared by Sarah Thomson of the In House Policy Consultancy (IHPC, 2003) to inform the development of Defra's policy on adaptation to climate change in the UK reaffirms the strategic priorities identified in the Climate Change Programme. Climate change, the report notes, presents major challenges in the areas of management of agriculture, wildlife and forestry and awareness raising, (particularly among land managers and in the food and drink industry) among other areas.

#### **4.0 Methodology**

Our earlier studies (Marsden et al, 2000, Smith et al, 2003; Thankappan et al 2004) indicate that private interest economic actors (particularly retailers) are increasingly playing a major role in (re)shaping UK food policy. Nevertheless, amongst the key actors there is a consensus on issues of common interest, and a more flexible and participatory relationship between the private interest, policy and regulatory interest and consumer and social interest groups. A complex model is emerging as a response to the (post BSE) food regulation pressures in ways which safeguard the broader macro-economic and political concepts of the European Internal Market (EIM) and increasingly integrated exchange of food goods within and beyond Europe, while also simultaneously enunciating new standardised and 'non-competitive' controls in the name of the European consumer and public interest.

As we outlined above, one of our key concerns is to assess whether the model of private interest food safety regulation may also operate in relation to climate change. Our other key questions related to the role of regulatory bodies and the 'reach' of companies in tackling environmental impacts. To operationalise these questions we have unpacked them into a series of topic based questions.

- Who along the food supply chain is first to recognise climate change? And which parts of the supply chain are laggards?

- How do different actors along the chain conceptualise climate change? For instance, is climate change strategy a matter of making energy efficient choices or participating in a trading scheme etc?
- Do key economic actors seek to exercise influence or management of climate change issues up and down the supply chain? Is there a recognition of the collective role of the food system in contributing and adapting to climate change?
- What do regulatory bodies understand of climate change in the food system? Do regulatory bodies keep to their traditional remits or can they embrace new responsibilities and perspectives? Do bodies that have regulated food and the environment as distinctive policy arenas seek to co-operate with one another? Are new patterns of governance emerging that are driven by the public sector?
- Are (food) consumer groups recognising the impact that climate change may have on the food system and of the role that consumers play? Are consumer groups having to rethink their traditional approach which is based upon a freedom to consume to one which recognises that there may be environmental constraints upon consumption?
- What changes (both technology and behaviour oriented) are envisaged by the various actors in food and farming and the supply chain as a response to climate change?

As a first step to tackle these questions we have undertaken a desk study involving a broad assessment of the secondary material i.e. from the web and documentary survey of available materials from retailers, food manufacturers, trade associations, regulatory bodies and consumer associations. Table 1 below lists the various organisations who were targeted in this study. The websites of the organisations involved in this research were accessed during the later part of April 2007.

We have sought to place the (in)actions of different interests in the food system into six broad categories. These are firstly organisations (and embraces private companies, regulatory bodies, government departments and pressure groups) that will have a more or less direct engagement with food and/or climate change.

**Table 1 List of various actors targeted in the research**

Sector	Actors
Consumer Organisation	National Consumer Council (NCC)
	DG Sanco
	The European Consumer's Organisation (BEUC)
Farming Organisations	Soil Association
	National Farmers' Union
	Committee of Professional Agricultural Organisations in the European Union (COPA)
	and General Confederation of Agricultural Co-operatives in the European Union (COGECA)
Food Manufacturers	Heinz
	Northern Foods
	Kraft Foods
	Unilever
Food Retailers	Musgrave
	Co-op
	Somerfields
	Morrisons
	Iceland
	Marks & Spencer
	ASDA
	Sainsburys
Policy making bodies	Tesco
	Department for Environment, Food and Rural Affairs (DEFRA)
	DG Agriculture
	DG Environment
Regulatory bodies	DG Enterprise
	European Food Safety Authority (EFSA)
	Food Standards Agency (FSA)
	European Environment Agency (EEA)
	Environment Agency (EA)

We have deliberately cast our net wide and this stage and included bodies that may be much more closely associated with the food industry or climate change but whose remit

should not necessarily exclude consideration of food or climate issues. Perhaps the bodies that fall most clearly into this category are the Food Standards and the Environment Agency and their European counterparts and we are interested to observe whether or not they seek to maintain their traditional regulatory boundaries or whether new patterns of governance may emerge as they respond to climate change. Secondly, we have placed organisations into one of six sectors: policy, farming, retail, manufacturing, regulation and consumer. These sectoral allocations are self-explanatory but allow us to identify whether, for instance, parts of the food system are more or less proactive in tackling climate change. The third category notes whether or not organisations recognise climate change as an issue that directly affects them. Fourth, for many organisations a precursor to the broader recognition of climate change may be a reporting of their emissions. Such an action may be well be a regulatory requirement and regarded as good practice environmental management. Fifth, since actions on climate change may take a variety of forms we have distinguished three sub-categories: does the organisation have aspirations to manage its climate change impacts (and this may often be in the form of targets); have climate change plans been linked to other environmental actions within the organisation; and finally, and most challenging, have detailed plans to adapt to or to mitigate climate change been produced. The sixth and final category seeks to ascertain whether organisations recognise that climate change management will involve a broader engagement with others in the supply chain. This is, perhaps, the most difficult issues for organisations to tackle since it may involve capacity building with other supply chain actors and the emergence of new patterns of private or public interest regulation.

An overview of the results of this survey is presented in Annex 1.

## **5.0 Tackling Climate change - whose responsibility?**

Political issues such as the international tensions over post-Kyoto emissions targets and the re-opening of the nuclear debate are likely to increase the intensity of exposure, driving consumer interest and turning passive awareness into passionate engagement. Regulations are already with us and more are on the horizon. These include 'cap and trade' schemes for carbon emissions and mechanisms to support renewable energy. The

results, from potential increases in electricity prices to more renewable power generation projects, are likely to be fairly visible.

Companies anticipating demand and legislation are already reviewing their operations and sourcing of materials and communicating a carbon responsible position. Such moves explicitly make the link to consumers' actions, offering consumers choices without big compromises in lifestyle. Although the full effects of climate change may not be seen for some decades, unpredictable events such as droughts, hurricanes and flash floods are becoming more frequent and severe. Such weather is already linked to climate change by the press, reinforcing the reality of change.

A study by the Carbon Trust on the operational exposure to climate change, both in terms of direct greenhouse gas emissions, and broader areas of influence or exposure found that Food and Beverages along with the Airlines sector were found to have the highest intangible value at risk (10% of market value and Airlines at 50%). These findings imply that Companies need to consider the implications of being seen to address climate change, as this impacts their reputation with consumers and corporate customers; with NGOs; with staff; with suppliers of finance; and with local, national and international public bodies, influencing anything from planning to access to natural resources.

In this research, as explained in the methodology we looked at the various materials (for example sustainability reports, websites, annual reports etc) published by UK-wide, key organisations belonging to regulatory/public, private interests and consumer/social interest groups closely associated with food and consumer issues. Table 2 below summarises the extent of recognition and actions that are being considered or taken by the actors in the food supply chain.

It is evident from the findings of this research that the policy and regulatory bodies have a certain degree of recognition (as compared to food retailers and manufacturers); though these bodies do not have clear detailed plans on tackling the issue, information is passed

down the supply chain more effectively compared to other actors within the food supply chain.

**Table 2 Extent of recognition and actions that are being considered/taken by the organisations in the food supply chain**

Organisations	Recognition of Climate change (%)*	Information on Emissions (%)*	Aspirations to tackle the problem (%)*	Actions related to environment (%)*	Detailed plans (%)*	Looking up to Consumers (%)*	Looking down to producers (%)*
Consumer organisations	33	25	25	33	0	33	33
Farming Organisations	33	0	25	0	0	0	33
Food Manufacturers	56	50	25	44	38	6	0
Food Retailers	64	57	20	30	59	27	9
Regulatory bodies	50	37	25	50	0	0	50
Policy making bodies	50	31	44	50	44	25	50

\* Percentage of each organisation category

The findings indicate that, while a small number of climate-aware retailers already show high level of awareness and disseminate this along the supply chain, there is a much larger group for whom the process is yet to begin.

The findings thus reiterate our earlier findings that private interest groups (particularly retailers) are increasingly playing a major role in (re)shaping the UK food policy. Nevertheless, there are consensus on issues of common interest, and there is a more flexible and participatory relationship between the private interest, policy and regulatory interest and consumer and social interest groups. The latter indicates that this is an amalgamation of state and private sector model of food regulation; where there is a specific response from public and private sectors to the various pressures on food regulation (for example see Smith *et al.*, 2004).

It came out very strongly in our earlier research (Smith et al 2004 and Thankappan et al 2004) that retailers, in the name of the consumer and public interest, are more influential, in food policy-making in the UK, partly as a result of their knowledge of and authority

over the constructions of the consumer interest. The questions now are: can retailers 'construct' similar models of supply chain regulation in relation to climate change? Can retailers (and others) construct notions of how climate change responsibilities and actions should be perceived in and outside of the food system? Or are other actors, such as those in the public sector playing a lead role in seeking to conceptualise and manage climate change?

Annex 1 provides a number of useful insights into beginning to answer these questions. First, most of the organisations that we have surveyed in the food system have at best only a very partial understanding or engagement with climate change issues. If we look in more detail at sectoral responses we can see, second, that food regulatory bodies (FSA and EFSA) are particularly constrained or unwilling to address what climate change might mean for the food industry. At most, climate change is perceived to have implications for microbiological food safety. Third, as is to be expected environment regulators (EA and EEA) are strong on climate change but limit their analysis to its implications for land use (e.g. water shortages leading to desertification, or the move northwards of crops or species commonly found in southern Europe). Fourth, in contrast policy making bodies show a much more mixed set of results. Some such as DEFRA and DG Agriculture have a much more holistic sense of the impacts of climate change. Others, such as DG Environment, DG Enterprise and Industry and DG SANCO are remarkably silent on climate change. In part, this silence may reflect the division of responsibilities for climate change in Brussels, in that DG Enterprise and DG SANCO follow the lead of DG Agriculture. That DG Environment should be so quiescent is rather more complex: national governments have tended to take the lead on climate change (though the EU is a signatory to the Kyoto Protocol) and energy policy and climate change are inextricably intertwined and it is only recently that the Commission has developed an energy policy since this had been a member state responsibility.

Quite clearly, therefore, there are major policy and regulatory gaps emerging if climate change and the food industry are to be addressed. Is the private sector moving into these spaces? Once again, it is a patchwork of responses that emerges. Fifth, those engaged

with the farming industry (e.g. Soil Association, NFU, COPA-COGECA) are with the exception of the Soil Association, which sees organic farming as a means to reduce fossil fuel use, not engaging with climate change. Sixth, consumer organisations at the UK level (e.g. NCC) have proved to be very active in recognising the climate change impacts of the food system and of seeking to manage them (e.g. promoting the consumption of seasonal foods). At a European level BUEC has not engaged with climate change debates. It is food manufacturers and retailers who are heavy energy users and the most high profile actors in the food system and, perhaps, feel most vulnerable to both policy or supply chain shocks who have been most active in addressing climate change issues at an individual, sectoral and supply chain level. If our analysis of the private interest regulation of food safety should ‘spill over’ into climate change, then perhaps we are beginning to observe its early signs. Sixth, food manufacturers have developed a number of individual initiatives (such as an environmental footprint) to measure and manage their energy use and/or carbon emissions. Some manufacturers are also using their EMS to engage with other actors in the supply chain to help them better manage their environmental impacts. Seventh, retailers have also recently moved quickly to tackle their energy use and to demonstrate to their consumers and other stakeholders that they are taking climate change seriously. For example, a number of retailers have set themselves CO2 reduction targets. In the section below we illustrate some of the initiatives that retailers and manufacturers are taking.

## **6.0 Food Manufactures and Retailers: Case Studies**

### **6.1 Kraft Foods**

Historically, their environmental efforts included various programs at manufacturing sites to reduce emissions, spills, solid waste, energy usage, water consumption and packaging materials. In the early 1990s, Kraft Food’s North American and international operations developed Environmental Management Systems (EMS) for their manufacturing facilities that are consistent with recognised international standards for plant-specific work practices and procedures. Ongoing monitoring and management of six global environmental performance indicators (EPIs) has resulted in the reduction of their environmental impact compared to 2001 (the baseline year).

In addition to the direct environmental impacts associated with manufacturing operations, Kraft Foods recognise that there are other impacts that flow in a range of areas, including procurement, transportation and distribution and product packaging. To help them understand the environmental significance of the various supply and consumption chain components, Kraft foods have partnered with the Wuppertal Institute for Climate, Environment and Energy, based in Germany, to review the important elements that contribute to the environmental footprint for some relevant product categories.

Having taken these steps Kraft foods have significantly improved the eco-efficiency of their manufacturing operations and are seeking further efficiencies. Simultaneously, they are working to identify significant potential environmental risks and opportunities in the product supply (procurement) and consumption chain (consumer) areas.

They work with local governments and communities, universities, scientific interest groups, trade associations and environmental NGOs.

## **6.2 Musgrave Group**

The Musgrave Group has operations in the Republic of Ireland, Northern Ireland, Britain and Spain, with annual sales of over €4.4 billion. Recently they brought out their revised Environmental Policy Charter (2000), and the published their new Environmental and Social Accountability Policy (2006). Simultaneously, they are also publishing new policies on 'Energy and Natural Resources Management' and 'Ethical Trading'.

Musgrave group regularly carries out detailed monitoring of energy use and sets improvement targets. The Group's Sustainability Report lists the greenhouse gas emissions from their operations and has separated the various elements of their carbon emissions pattern over the period 2002-2005, to demonstrate the comparative contributions from the different parts of the business (Carbon footprint). A recent initiative (April, 2006) is the introduction of Biodiesel as a fuel for their logistics fleet. Other significant issues tackled by the group include waste management and recycling as

a means of raising awareness of environmental best practice among company employees. Above all the Group have undertaken an extensive consultation with their primary stakeholder groups on the issues they (stakeholders) would like to discuss and report. This work undertaken to engage with stakeholders on the issues of greatest relevance to the Group and the focus for reporting, provides a detailed basis for demonstrating how Musgrave has responded to stakeholder concerns.

### **6.3 Waitrose**

The John Lewis Partnership is a firm supporter of the Kyoto Protocol, and has made a public commitment to reduce carbon dioxide emissions by 10 per cent by 2010, relative to their trading pattern in the year 2001. The Partnership is also a member of the Corporate Leaders' Group on Climate Change, and part of HRH the Prince of Wales's Business & the Environment Programme. As a member group they are committed to take action on climate change, and offer support to Government in developing new, longer-term policies for tackling climate change. Since 2001 the Partnership has calculated the Carbon Footprint of their operations (Waitrose and John Lewis). The partnership provides a detailed breakdown on emissions in their website. The Partnership is working with the Carbon Trust, to identify ways of reducing energy consumption and therefore the carbon dioxide emissions.

A Partnership-wide energy awareness campaign, 'Save Energy, Share the Savings', was launched in 2005 to show Partners how they could make simple energy savings for example by reducing use of heating and air conditioning, and switching off lights and computers. To improve general housekeeping an Energy Awareness Manual has been developed and distributed to all Waitrose branches. This provides detailed guidance on when and how to use energy efficiently. All branches also receive monthly energy reports highlighting whether they have met their efficiency targets. This enables them to monitor trends, identify problems quickly, and identify and share best practice.

## **6.4 ASDA**

ASDA has committed to reduce carbon emissions by 80,000 tonnes by 2007, and some of the ways they are seeking to meet this target are through reducing the number of road miles travelled by its fleet (by moving more of its freight to rail). ASDA are currently converting their entire fleet of trucks so that they can run on bio diesel. They have submitted planning applications to install wind turbines at six of their depots. ASDA's environmental policy is committed to reducing GHG emissions from their stores and distribution centres by reducing energy consumption, reducing refrigerant gas losses and phasing out the use of CFCs. Further they are encouraging colleagues and customers to use 'green transport'. Information gathered from the ASDA website indicates that they disseminate environmental best practice guidance to all ASDA colleagues through their ASDA 'Energy and Environment' best practice intranet website; 'Colleagues at Work' which offer advice on energy saving, energy surveys, general waste, paper waste, recycling, transport and water. 'Colleagues at Home' offers advice on energy efficiency at home, including information on appliances, heating, insulation and lighting.

## **6.5 Tesco**

Tesco is reducing emissions from their transport distribution fleet. To measure the environmental impact of their distribution fleet accurately, the 2007 vehicle efficiency KPI will be calculated based on CO<sub>2</sub> produced per case delivered instead of per litre of fuel consumed. Some of their initiatives to reduce emissions from their distribution include:

- Working with suppliers to ensure that their vehicles do not travel empty after making a delivery.
- Investing in double deck trailers which carry 67% more products per load.
- Reducing the number of times delivery is made to Express stores each week and improving the way vehicles are filled
- Investing in equipment which reduces emissions of nitrous oxide by 30% and particulates by 50%.

In May 2005 Tesco introduced a 5% bioethanol mix into their standard unleaded petrol at 185 petrol stations. In January 2006 all of Tesco's filling stations in the South East and North West of England were converted to biodiesel. Green travel plans for staff are becoming an integral part of their new store and store extension development proposals. Tesco claims they are committed to reducing the number of employees coming to work by car, through initiatives like walking buddies and car sharing.

## **7.0 The Moving Goal Posts**

Following a series of high profile pollution disasters during the 1980's, there was an upsurge in Environmental Management Systems (EMS) reflecting the pressures on business, together with the realisation that the presence of a functioning EMS might be a mitigating factor should a company find itself in breach of environmental norms. Both the reporting and EMS developments remained voluntary, with increased momentum in the early 1990's, especially in Europe. Companies with an environmental management system discovered the "low-hanging fruit" of identifiable reductions in waste management, energy and water costs and the message passed on.

Something similar may happen with regard to climate change. There are plenty of reasons for business to act to reduce their carbon footprints, regardless of whether or not it is, in moral terms, the right thing for them to do. Even at a basic level, reducing emissions, particularly through energy efficiency, can result in significant cost savings. Many businesses are finding that efforts to manage climate change can save money, increase revenues, enhance their brand and boost productivity. Some of the benefits that companies have accrued from addressing the issues surrounding climate change are for example:

- (i) Reduced Operating Costs
- (ii) Increased Market Share
- (iii) New Revenue Sources
- (iv) Improved Cost-to-Growth Ratios
- (v) Improved Productivity and Quality
- (vi) Enhanced Brand

(vii) Mitigation of Future Regulatory Impacts

Climate change is addressed in or through a number of regulations, legislation, treaties and voluntary programs. Many businesses though have reduced their energy consumption and pollution in a variety of ways. Key climate program elements include:

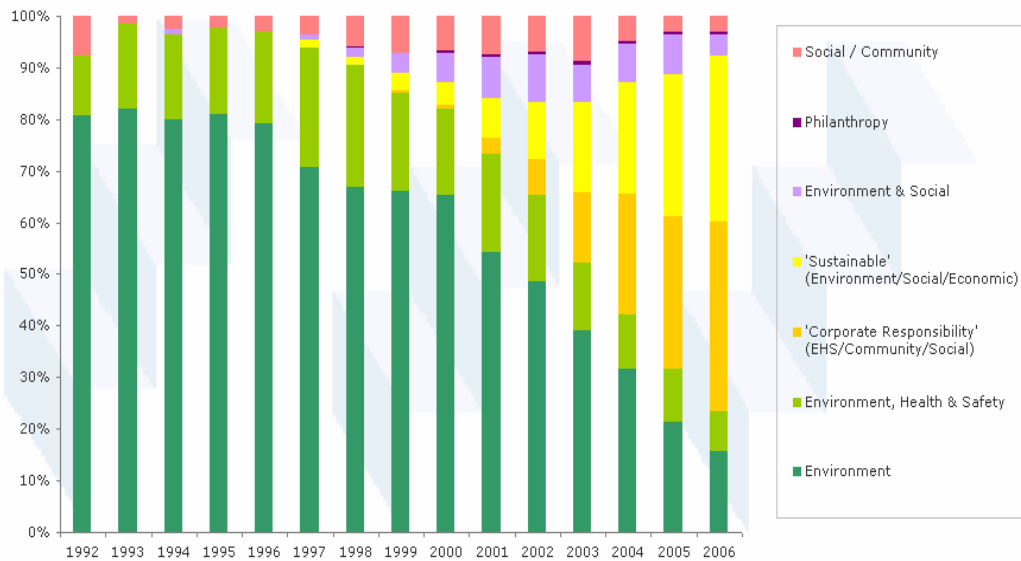
- (i) Improving Energy Efficiency
- (ii) Limiting Transportation
- (iii) Purchasing Renewable Energy
- (iv) Trading Emissions
- (v) Offsetting Carbon Emissions
- (vi) Measuring and Reporting GHG emissions

As regards consumers, there are encouraging signs that customers are willing to exert their power through what they choose to consume, however, the Climate Group's research has shown that there are still major barriers keeping individuals from doing more. These, range from lack of awareness about the problem to a feeling of powerlessness, perceived inconvenience around possible actions, wanting clearly to see that governments, businesses and other individuals are also doing their bit, and reluctance to pay extra for climate-friendly options.

In an era of self regulation, governments encourage the voluntary aspect of such activities, seeing the prospect for progress without the need for confrontation. Some businesses therefore have embarked on programmes of emissions reporting out of a conviction of "doing the right thing", under the banner of corporate citizenship. More often, however, risk minimisation was the primary driver whether risks from actual and anticipated legislation, or those to corporate and brand reputations.

As reporting has progressed (See Figure 2), businesses are now suggesting that they have relatively insignificant direct environmental and social impacts, but much larger indirect ones. However, very few companies have chosen to produce reports in full compliance with complete set of guidelines, choosing instead to follow a general direction.

**Figure 2 Global Report Output by type**



Source: [www.CorporateRegister.com](http://www.CorporateRegister.com)

## 8.0 Conclusions

Across most countries and sectors, businesses are assessing their approach to non-financial business issues. And the goalposts keep moving. At first, the issues were mainly environmental. Then the term “sustainable development” came to the fore, followed by corporate social responsibility and corporate governance, now it is climate change that is setting the agenda. Along with climate change go terms such as carbon management and carbon footprinting.

The Earth Summit in 1992 changed outlooks in several ways. Firstly, it spread the message that sustainable development should address not only environmental issues, but should seek equilibrium between the aspects of environment, social activity and the economy. Secondly, it became clear that command and control regulation could not address the many interconnecting balances and decisions needed on the path towards sustainability, and responsible companies, especially multinationals, could no longer use compliance as a universal shield against the expectations of civil society. And thirdly, it became clear that developing countries could not be expected to attain the living

standards they desired, while implementing the checks and balances needed to prevent impending environmental and social disaster, by pulling on their own boot-straps. These changes have profoundly changed the way companies address their responsibilities and indeed, how they define them. In turn, their public reports have shown a marked change from the purely environmental to the current wave of sustainable development, corporate responsibility and emissions reporting. The change of emphasis is happening gradually, and the pendulum is still swinging; hardly surprising when it takes so much longer to address new issues than it does to recognise and define them.

Whereas the concept of sustainable development developed over a number of years and seemed firmly established, the new “Climate change” buzzword has emerged from the business community only over the recent years, therefore, under this rapidly changing climate, food businesses need to be and create more awareness of the climate-sensitivities. While a small number of climate-aware companies already show high level of awareness and disseminate this along the supply chain, there is a much larger group of actors for whom the process is yet to begin. There are various reasons for this trend, First, uncertainty about climate vulnerability, and about the costs and benefits of creating awareness are critical issues. The capacity to do so depends on business culture and strategy, resources, and on the market and regulatory context in which the business operates. Second, businesses are continually responding to new pressures to adapt from customers, suppliers and regulators. Creating awareness and/or disseminating the ideas on climate change will happen in the context of these other changes, as most moves are associated with costs. Third, most business see it as the responsibility of the government through its policies to disseminate issues regarding climate change through the UK Climate Impacts Programme (UKCIP).

Our earlier research findings as well as this research emphasises the fact that private interest groups (particularly retailers) are increasingly playing a major role in (re)shaping the UK food policy. However, the emergence of private-interest regulation does not steer clear of the need for the State to protect the consumer interest. Now, private interest regulation needs a consultative and ‘stake-holder’ State such that it can appease growing

consumer/public concerns about the food supply system. However, it does shape the ability of the State to act in the interest of the consumer. The need therefore is to map out its effects and impacts, and to measure how this model continually metamorphoses to the constantly emerging pressures of the society.

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### Annex 1 Responsibilities for Climate change in the UK food supply chains

S No.	Organisation	Sector	Recognition of Climate Change	Reporting of emissions	Actions for CC			Supply chain Scope		Comments
					Aspirations	Linked to environmental actions	Detailed plans	Looking up (to consumers)	Looking down (to producers)	
1	EFSA	Regulation	×	×	×	×	×	×	×	
2	FSA	Regulation	Limited to micro-biological safety	×	×	×	×	×	×	
3	DEFRA	Policy	v	v (for UK)	60% reduction in CO2 by 2050 and 26-32% by 2020, against a 1990 baseline in Climate Change Bill	v	FISS has info on climate change (CC) and FISS Champions on Energy and CC (including manufacturers retailers but not farmers)	v	v (with FISS)	
4	EEA	Regulation	v (inc. for agric esp land use)	v Data on food sector	v	v for agri-environment schemes	×	×	v	
5	EA	Regulation	v (inc for agric esp land use)	For food and drink sector and concern for farm-based emissions	×	v for agri-environment schemes	×	×	v	

6	DG Agric	Policy	v	Agric contributes @ 10% EUs GHG emissions	v reduce emissions and encourage bio-fuels	v	v on emissions	x	v	
7	DG Environment	Policy	x	x	x	x	x	x	x	
8	DG Enterprise & Industry	Policy	x	x	x	x	x	x	x	
9	Soil Association	Farming	v	x	Promote organic farming because reduces fossil fuel energy use	x	x	x	v	
10	NFU	Farming	x	x	x	x	x	x	x	
11	COPA - COGECCA	Farming	x	x	x	x	x	x	x	
12	Heinz	Manufacturing	x	x	x	x	x	x	x	Major emphasis on EMS
13	Northern Foods	Manufacturing	v Conducted Carbon footprint	x	Aim to reduce energy use by 5% from 2006/07	They are a part of a project to build a waste network that will produce energy (biofuels) from food waste	Monitoring Carbon emissions to meet the CC levy agreement	x	x	
14	Kraft Foods	Manufacturing	Indirect recognition	v	Reduce energy use through reducing env. footprint	Conducted environmental footprint	x	Stakeholder engagement but nothing in direct relevance to CC		Emphasis on EMS

15	Unilever	Manufacturing	v	v	x	x	Eco-efficiency, advanced refrigeration and renewables *	x	x	
16	Fortnum and Mason	Specialist Retailer	v	v (indirect) Water use, gas, electricity	x	Waste recycling and regular emissions inspection of vehicles	Waste management	x	x	
17	Musgrave Group	Retail	v Stated in Policy objectives	v	x	Transport fleets have initiated the use of bio-fuels	Initiated a energy monitoring and targeting plan to reduce CO2 emissions over next 5 years *	v	v	Sought a broad range of stakeholder opinion in relation to issues they perceived to be most relevant
18	Co-op	Retail	x	x	x	Waste reduction & management	x	x	x	
19	Somerfield	Retail	x	x	x	Waste reduction	x	x	x	
20	Morrisons	Retail	v	v	x	x	Responsible energy sourcing and efficient consumption	x	x	
21	Iceland	Retail	x	x	x	Fish sustainability and Commercial whaling	x	x	x	

22	Marks & Spencer	Retail	v	v	x	x	Reducing energy and water use, improving on refrigeration and air conditioning and waste management	x	x	
23	Waitrose	Retail	v	v	x	x	Set targets to reduce CO2 emissions per £million sales by 2010 against 2001/02 baseline	x	x	
24	ASDA	Retail	x	x	Committed to reduce CO2 emissions by 80000ton by 2007 compared to 2001 baseline	x	Energy efficient technologies and fleet transport to be run by bio-diesel	v	Established a carbon club to identify opportunity to reduce energy consumption	x
25	Sainsburys	Retail	v	v	Will reduce CO2/SqM by 5% by 2008 against 2004/05 baseline	x	v	x	x	Working with Government and the Carbon Trust

26	Tesco	Retail	v	v	Reduce Carbon footprint throughout the World by 50% by 2020, restrict air transport to less than 1% of the products	×	v	v Consumers* * started the Tesco car share to cut on emissions	×	Working with Carbon Trust
27	NCC	Consumer	v	Contribution of food sector	Reduce GHG emissions of food	v (e.g. seasonal foods)	×	v	v	The most detailed analysis of actors in the food system
28	DG Sanco	Consumer	×	×	×	×	×	×	×	
29	BEUC	Consumer	×	×	×	×	×	×	×	

Notes:

Defra and food and climate change – Defra is stronger on farming and climate change than the other parts of the food chain.

<http://www.defra.gov.uk/farm/environment/climate-change/impact/index.htm>

Key document is climate change and agriculture in the United Kingdom

<http://www.defra.gov.uk/farm/environment/climate-change/impact/climate.pdf>

EEA work on farming can be found at

[http://themes.eea.europa.eu/Sectors\\_and\\_activities/agriculture/reports](http://themes.eea.europa.eu/Sectors_and_activities/agriculture/reports)

The EEAs work does not directly tackle climate change and farming but rather seeks to assess and measure the quality of the rural environment, for example, or the integration of the environment into agricultural policy making. The EEA does produce a simple guide to farming and climate change

<http://epaedia.eea.europa.eu/page.php?pid=346>

The EEA does not specifically address the rest of the food supply chain but does suggest that climate change will have adverse impacts for food security and also for areas that use traditional farming systems and produce quality produce (see p18 of [http://reports.eea.europa.eu/technical\\_report\\_2005\\_1207\\_144937/en/EEA\\_Technical\\_report\\_7\\_2005.pdf](http://reports.eea.europa.eu/technical_report_2005_1207_144937/en/EEA_Technical_report_7_2005.pdf))

Defra (2006) Food Industry Sustainability Strategy

DG Agriculture restricts its role to agriculture; DG Environment does not specifically consider food or farming and DG Enterprise and Industry does not address climate change and the food industry.

National Consumer Council addressed food and environmental impacts (p73-5) in a 1997 report though it does not explicitly link consumption and climate change

[http://www.ncc.org.uk/responsibleconsumption/cons\\_and\\_env.pdf](http://www.ncc.org.uk/responsibleconsumption/cons_and_env.pdf)

However, in a report on school meals Responsible Consumption, farming and climate were linked (see p14-15) though this did not go further along the chain to become a broader analysis of food.

[http://www.ncc.org.uk/responsibleconsumption/double\\_dividend.pdf](http://www.ncc.org.uk/responsibleconsumption/double_dividend.pdf)

Retailers environmental performance was tackled in a report on Greening Supermarkets

NCC has also produced a briefing paper on seasonal foods and a key reason for promoting them is to help tackle climate change.

<http://www.ncc.org.uk/responsibleconsumption/seasons-promise.pdf>

A September 2006 Board meeting had provided for it a comprehensive strategic paper on sustainability that dealt with consumption and which highlights the role of food (see p9-24) <http://www.ncc.org.uk/about/sept2006.pdf>