

How Will Climate Change Impact Market Requirements for Victoria's food Exports?

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***Abstract:** Consumers and retailers contribute to shaping product requirements for food producers and manufacturers. The State of Victoria is a net food exporter and consumers and retailers in food export markets are of particular interest to Victorian food producers and manufacturers. Consumers and retailers in export markets are responding to climate change and this study seeks to understand how such responses may impact up the value chain to affect food producers. Some of the world's largest retailers are beginning to encourage their suppliers to reduce their carbon emissions. This is being driven by concern for the environment but is commonly a justifiable business decision as well. In addition to regulatory pressure and/or environmental concern there are market drivers that may compel food producers to respond to climate change.*

Introduction

Climate change, anthropogenic carbon emissions, carbon footprinting and carbon labelling have received significant attention in recent years. The focus of much of the discourse on adaptation of food production and manufacturing to climate change has been on compliance with carbon emission regulations (McCarl & Schneider, 2000; Thomassin, 2003; Garnaut, 2008) or practice change to cope with changed climatic conditions (Smith et al. 2000; Olesen & Bindi, 2002; Smit & Skinner, 2002; Jones et al. 2007). However, in addition to issues of regulation and behavioural change there are market drivers that may encourage food producers and manufacturers to adapt to climate change.

Interest in the contribution of food value chains to carbon emissions has grown. From early attempts at understanding a food product's environmental impact such as 'food miles' (Lang, 1999) the discourse has moved to focus on carbon footprints and labels to reflect a product's complete journey through its value chain. The general interest in climate change and carbon emissions may be leading to a market for food products that are efficiently produced in terms of carbon emissions.

The research described here sought to investigate responses to climate change by consumers and retailers that may reverberate up food value chains to impact food producers by investigating the following issues:

- Consumer interest in 'carbon efficient' food.
- Retailer interest in 'carbon efficient' food.
- Uptake of carbon footprint and label.
- Climate change as a risk management issue.

Methodology

This study was conducted by way of literature review and applied market research.

Retailers, often being the largest single participant in food value chains and being regarded by some authors as ‘choice editors’ (Sustainable Development Commission, 2008), were identified as the key information source for this study.

Semi structured interviews based on the findings of the literature review were conducted in the United Kingdom (UK) and Japan with a sample of large food retail companies and food industry commentators. A total of 15 interviews were conducted over a two week period in February 2009. The UK market was chosen for investigation being a leading market in the thinking on incorporating the implications of macro environmental factors into the food system. The Japanese market was selected for investigation being the State of Victoria’s most valuable food export market (DPI, 2008) and having a strong Corporate Social Responsibility (CSR) agenda as demonstrated through its leadership with the Kyoto protocol. It is also the first Asian market to act on issues such as climate change and may be used as an indicator for behaviour in other Asian markets. The interviews in both markets asked respondents to talk about:

- Climate change responses detected in consumers.
- Changes to the profile of food products stocked based on climate change.
- Engagement in carbon footprint and label.
- Pressure on suppliers to respond to climate change.
- Efforts to secure supply sources given prediction of changes in production patterns due to climate change.

In addition to this applied market research data about Tesco, Sainsbury’s, Carrefour, Wal-Mart, Kroger, AEON and Seven & I Holdings from the Carbon Disclosure Project (CDP) was also used. Combined, these retailers operate 76,650 stores across 67 countries (IGD, 2008). The CDP is an initiative to share climate change information between shareholders and companies. The CDP provides primary data via their website on climate change from participating companies by way of the CDP’s annual ‘information request.’ In addition, research investigating consumer and retailer responses to climate change from the literature has also been incorporated.

Findings

Consumers

Consumers in retailer’s stores may respond to climate change in two ways. They may alter the profile of their shopping basket to favour food products that they perceive as being inherently more carbon efficient, such as replacing animal protein with plant protein (Pollan, 2006), select products with less packaging (Nielsen, 2008) or buy locally produced items (Alvensleben & Schrader, 1998). Consumers may also base some purchasing decisions on carbon labelling where it is available.

A body of literature on consumer responses to climate change is still being developed amongst consumer behaviour researchers. While some work has been done to profile the environmentally conscious consumer segment (see Wier & Calverley, 2002; Vermeir & Verbeke, 2006 for example), information about emerging climate-sensitive consumption is sparse. The advent of climate change as a mainstream issue is so recent that literature relating to the assessment of consumer behaviour with respect to climate change has not yet emerged. Further, as most of the literature on consumer behaviour and climate change is skewed toward concern about over consumption and overuse of resources (see Hamilton, 2005 for example), it is difficult to obtain an impartial assessment of the impact of climate change on consumer behaviour. Existing work on consumer behaviour with respect

to organic food or consumer attitudes to the environment may provide a sense of how consumers might respond to climate change however this has not been proven.

A dedicated consumer segment responding to climate change is still very small. In lieu of specific climate change literature on consumer behaviour, international consumer market research estimates the consumer segment concerned with the environment to represent between 4% (PricewaterhouseCoopers, 2008) and 23% (TNS, 2008) of the total retail market, depending on the markets researched and the study design. Further segmentation reveals a range of consumer attitudes to the environment. For example, a recent study conducted by TNS titled, 'Shades of Green Segmentation' (2008) identifies key segments in relation to the environment. The segments range from highly environmentally motivated and active segments such as the Respectful Stewards (7%) and Eco Centric (16%) to total non-believers (Eco Villains), who constitute 7% of consumers as the finding above suggests. This was supported by the retail interviews. A British retailer commented,

"...you've got the 10% who are the green crusaders...we don't think we can build a business on that 10%. We're aiming for the big group in the middle"... UK retailer.

Consumer attitudes are not a good indicator of the purchase intentions for climate friendly products. Consumer behaviour research suggests that purchase decisions are influenced by consumers' attitudes and beliefs (Verbeke & Viaene, 1999; Makatouni, 2002; Pickett-Baker & Ozaki, 2008). A review conducted by Fraj & Martinez (2007) highlighted the importance of the attitude-behaviour paradigm in describing environmental consumer behaviour. They considered that values influence people's personality characteristics; that people's personality influence whatever their attitudes to the environment are; and that attitudes are directly related to behaviour. Consumers may express concern about the environment but choose not to purchase products that are environmentally friendly.

"Consumer attitudes tend to evolve rather than dramatically change overnight...and it's always a bit dangerous to average out consumer attitudes, because in reality there's a whole range of different people thinking different things."... UK NGO.

Price rather than carbon attributes of food will appeal to most consumers. Despite the sparse literature on consumer responses to climate change, many of the interview participants indicated that price, rather than carbon attributes, of products would appeal to most consumers.

"We do not expect carbon footprinting to motivate consumer appetite because we understand consumers tend to choose quality products of reasonable price and they are not willing to pay extra to cover sustainability activities of the producer."...Japanese retailer.

"Initially we thought consumers would choose products based on carbon label or some indication of carbon footprint, but this may not be the case." ... Japanese retailer.

Consumers are not well informed about carbon footprinting or carbon labelling. There was also a perception amongst interviewees that consumers are not well informed about the carbon footprint of food value chains nor well equipped to interpret a carbon label on food products.

"Consumers are not well informed. Consumers think their own impact is tiny so they see business and government as those who should do most."... UK retailer.

"There are not many consumers with precise understanding of carbon footprint and what labels state."... Japanese retailer.

Retailers

Retailers are making changes to their businesses relating to climate change in response to government policies such as emissions trading schemes and consumer concern. These include encouraging carbon footprinting in their value chains, carbon labelling and/or seeking climate-secure supply sources as part of their response to climate change. These responses by retailers, most being publicly listed companies, are consistent with their profit maximisation agenda and are decisions driven by the environmental imperative but justifiable in a business profitability context.

There is a business imperative for reducing carbon emissions. Retailers invest in their climate change reputation to differentiate themselves from competitors. Climate change presents retailers with an opportunity to engage in CSR in a manner that is consistent with their reason for being – most of the world's largest retailers are publicly listed companies and profit maximisation is assumed. Responses to climate change that are sensible business decisions, independent of any environmental benefits can be expected of retailers. A spokesperson for the French retailer Carrefour commented, “over and above the opportunities to reduce costs and improve efficiency, the Group sees its active engagement as a means of meeting growing consumer and societal demand for companies to act responsibly and to contribute to sustainable development” (CDP – Carrefour, 2008).

Most retailers are therefore engaged in efforts to manage the carbon emissions for which their business is directly responsible.

The Japanese retailer AEON is operating fewer trucks, and increasing the opportunities for backhauling (AEON, 2008). Similarly, Seven & I Holdings are focusing on reducing their electricity and fuel consumption (Seven & I Holdings, 2007). American retailer Kroger uses heat produced by refrigeration equipment to also heat the air and water in their stores (Kroger, 2008). Kroger is also trying to reduce the total distance travelled by its distribution fleet (CDP-Kroger, 2008). These activities are consistent with the literature which suggests that retailers may invest in addressing carbon emissions to reduce costs, comply with regulations and/or differentiate themselves from competitors (Hoffman, 2005).

“[Retailers recognise] carbon has a correlation with cost, so if you can reduce carbon you can reduce costs, which then can be passed on to consumers. So they see those sorts of things lining up, and that’s why retailers in particular do get behind these schemes.”...UK NGO.

Retailers are encouraging carbon footprinting in food value chains. Only a small portion of an food product’s carbon footprint occurs at the retail point of the value chain. Most carbon emissions from food products are associated with the production phases (Stichting Duvo, 2008). While retailers may invest in reducing carbon from their operations to differentiate themselves and improve their own efficiencies, retailers also need to engage their value chains to increase efficiencies within the value chain. Wal-Mart has been one of the most active retailers in encouraging food producers and manufacturers to measure and manage carbon emissions. Wal-Mart recently introduced their ‘Global Sustainable Sourcing Initiative’ committing Wal-Mart to preferentially selecting suppliers that aggressively reduce carbon emissions (Waye, 2008). Part of this initiative is a ‘supplier scorecard’ that, “will require [Wal-Mart’s] food suppliers to respond to a manufacturing, farm and/or supply chain questionnaire, depending upon the nature of their business. In early 2008, Wal-Mart buyers were able to use the scorecard to influence their purchasing decisions (IGD, 2008). “We have publicly stated that preference will be given to suppliers with strong and improving environmental performance. These considerations include the carbon and energy impacts of the products we sell” (CDP-Wal-Mart, 2008). Similarly and interviewee commented,

“It is essential for suppliers to have the capability to detect carbon footprint up to the time the product leaves that manufacturers site.”...Japanese retailer.

There will be no premium for carbon measured and managed food – carbon footprinting is about increasing efficiency and reducing purchase cost. There is a strong business case for retailers to encourage their value chains to measure and manage carbon emissions. With increased efficiencies and cost reductions acting as the leading drivers for retailers to engage their value chains in carbon emission reduction activities, no premium for carbon measured / low carbon food products should be expected by food producers and manufacturers.

Reducing carbon emissions makes good business sense. There is an association between reduced emissions and greater profit (King and Lennox, 2001) and waste prevention leads to financial gain (King and Lennox, 2002). Hoffman (2005) noted that companies that are able to reduce carbon emissions by altering products or processes could realise an advantage. Retailers may also reduce their costs and increase their competitiveness by sourcing products that are cheaper by way of being less resource intensive (Deurer et al. 2008). An interviewee commented,

“[Our] response to climate change is not only to minimise waste and save natural resources, but also to reduce our purchase cost” ... Japanese retailer.

Carbon footprinting can be attractive as a means of identifying areas in the value chain where greater efficiency can be realised. An interviewee commented,

“In general all the big manufacturers think that the principle of carbon footprinting is a useful one because you can see where the impacts flow along your supply chain.” ...UK NGO.

The carbon footprint for Walkers Crisps demonstrates this point. Potato producers were paid by weight and stored their potatoes in humidified sheds to increase the water content and thus the weight of their produce. The potato chip manufacturer, Walkers, then had to fry potatoes longer because of the greater water content. Both humidifying and desiccating processes are energy expensive. By varying the pricing structure according to water content both the potato producers and Walkers could save energy and costs (The Carbon Trust, 2006).

Retailers are identifying new market opportunities and some are carbon-labelling food. Those consumers attracted to retailers or products with desirable carbon emission characteristics present an opportunity for retailers to realise a new market opportunity (Hoffman, 2005). Retailers can attempt to appeal to these consumers by way of promoting the climate-friendly characteristics of their own operations and by offering consumers products that are perceived as being climate-friendly too. The carbon footprint of a product can be communicated to consumers by way of a carbon label.

A carbon label is designed to encourage consumers to differentiate between products based on the product's carbon characteristics. Carbon labelling has gained significant momentum recently (Brenton et al. 2008; Weidema et al. 2008), as shown through the support by the UK and Japanese Governments through DEFRA, BSI, The Carbon Trust, METI and through use in store by Tesco. In Japan the retailer AEON intends to trial carbon labelling of seven products through METI's voluntary carbon labelling scheme, including rice, carrots and onions during 2009 before expanding the trial to another 43 products, including some imported foods (United States Department of Agriculture, 2008).

A carbon label on food products allows for a comparison based on the product's carbon characteristics. Retailers derive competitive advantage from selling non-standardised products that are not generally available in the market and which compete on more than price alone (Dolan & Humphrey, 2000). The motivation for launching carbon labelling schemes is to give a company a green profile and to target environmentally sensitive market segments (Brenton et al. 2008; Butner et al. 2008). One aspect of a successful product could be its low carbon rating. Consumers offered similar products with different carbon credentials, *ceteris paribus*, may opt for the less carbon intensive choice (Garnett, 2008). Even so, how consumers will trade off between price, quality, or carbon footprint is still unclear (Deurer, 2008).

Carbon footprinting does not always lead to carbon labelling. Except for a carbon label requiring a carbon footprint, the drivers behind each can be quite different. Retailers who invest in carbon

footprinting make a conscious decision about whether consumers need to be made aware of the results on labels. There is a strong business case for carbon footprinting, while the case for carbon labeling is less compelling. It is likely that those organisations that expressed resistance to carbon labelling see it as an unnecessary cost, or a poor investment (high cost to attract a small consumer segment) in the context of their organisational strategy. Simply because an organisation has understood the carbon footprint of its products does not imply that they will carbon label those same products. Interviewees in both the UK and Japan expressed resistance to carbon labelling.

“Reducing carbon and capturing carbon footprint at every level of our operation is more important than labelling.”...Japanese retailer.

Apart from those organisations that have actively participated in developing a carbon label, the reaction to carbon labelling among the organisations interviewed was ambivalent.

“The effort needed to get to the level of certainty required to make an on-pack claim [carbon label] is nonsensical – available tools and standards are inadequate. More realistic is the value in looking at 80/20 life cycle analysis work and then identifying the hotspots and beginning to address these constructively within the supply chain.” ...UK retailer.

Retailers are not presently imposing mandatory requirements for food producers and manufacturers, though they do not rule it out for the future. Retailers interviewed were asked if they were placing any pressure on their suppliers to measure and reduce their carbon emissions. Interview respondents indicated that, at present, there are no direct requests being made of suppliers. Nevertheless, as previously noted, Wal-Mart is leading the way in supplier engagement on carbon emissions with the release of their ‘supplier scorecard’.

“We have not made many requests to processors, exporters and producers to reduce [carbon] emissions yet, [however our parent company] is very active in involving value chain participants on this.”... Japanese retailer.

Most retailers interviewed went on to state that they expect that their suppliers were investing in carbon measurement and reduction, and hinted that formal requests of suppliers might be possible for the future.

“We don’t set specific expectation amongst our suppliers; however we believe each supplier would support energy saving projects and also our supply chain management will lead them to rationalise and create a system which reduces CO2 as a result.”...Japanese retailer.

Climate change is becoming a risk management issue for retailers. Food production is largely dependent on climate. Retailers, depending on agricultural production for their food offering, particularly fresh food, are thereby also exposed to climate change impacts on food production. Production changes influenced by climate change may include changes in the length of crop growing seasons, regional patterns of crop production and shifts in the range of some livestock diseases (Darwin et al. 1995). Production patterns may not just vary but become more volatile (Rosenzweig et al. 2000). Given retailers depend on consistent supply, variable and volatile production patterns may challenge their supply arrangements. An interviewee commented,

“We regard climate change as a risk to our beer ingredients because they are all natural products.”...Japanese manufacturer.

It is possible that retailers will look to alter their value chain relationships if consistency cannot be guaranteed. A spokesperson for Tesco commented, “a change in growing seasons and increased or reduced rainfall patterns will mean changes for retail suppliers including ours, and they may be increasingly hit by extreme weather events. This will put existing sources of products or the companies that supply us, at risk and bring instability into the value chain” (CDP-Tesco, 2008).

A spokesperson for the Japanese retailer AEON captured the importance of climate change to their retailer, “Our business operations and product offerings are affected by climate change, since climate change affects consumer behaviour and subsequently the demand for goods.

Climate change is beginning to be incorporated into the supply risk management strategies of retailers and food manufacturers. Carrefour has mapped climate risks for each country where it has operations (CDP-Carrefour, 2008). An interviewee commented,

“It won’t lead to a change in suppliers at the moment, but it is possible in the future...to manage risk we have secured several supply sources.”... Japanese manufacturer.

Some interviewees indicated that their organisation was using climate projections to inform their long-term supply strategy. “Climate projections contribute to the buying strategy.” ...UK retailer.

“We’ve always done this type of thing; it’s just now that it’s becoming more sophisticated.”...UK retailer.

Conclusion

The implications for food producers and manufacturers of not responding to or misreading their customer’s response to climate change may be to the detriment of their competitive advantage. The small size of the consumer segment committed to climate friendly food and the inconsistent nature of consumer behaviour with respect to environmental attributes of food make consumers a less robust indicator by which food producers can accurately gauge a market’s response to climate change.. Rather, it is the response of retailers to consumer demand and climate change that will dictate future value chain requirements. Retailers emerged from this study as the key value chain participant to monitor when attempting to understand demand for carbon measured and managed food products. Even so, an investigation of consumer responses to climate change that engages consumers would be a timely addition to the literature.

Retailers are pursuing operational improvement, encouraging carbon footprinting in their value chains, carbon labelling and/or seeking climate secure supply sources as part of their response to climate change. These responses by retailers are decisions driven by the environmental imperative but justifiable in a business profitability context.

The Victorian food production sector should continue to monitor key global retailers and how they implement carbon reduction strategies. A well designed and implemented carbon footprinting scheme should favour carbon-efficient food producers regardless of their location relative to their market. Government policy addressing mitigation, abatement and adjustment to climate change in food value chains could support opportunities for food businesses to increase carbon efficiency.

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