The Impact of the Packaging Material Regulations upon a Small to Medium Manufacturing Enterprise in the UK: barriers to maximising supply chain environmental performance.

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Introduction

The issue of sustainability is one that is of concern to society and has become increasingly important to most businesses. The Brundtland Report (1987) defined sustainability as the ability to meet the needs of the present without compromising the needs of the future, and was the first to raise awareness of the sociological, institutional and economic dimensions of our collective environmental impact and placed sustainability onto the political agenda. This and subsequent reports spurred the introduction of a broad range of legislation to ensure that organisations contribute to efforts to reduce their immediate and long-term impact upon the environment.


The UK produces around 10 million tonnes of packaging waste per annum, much of which is ultimately disposed of via landfill but which could be recycled (Gateway, 2011). As environmental issues continue to be of concern to the wider public (DEFRA, 2011) the reduction of packaging waste is likely to be an important and demonstrable aspect of an organisation’s commitment to be
socially responsible. Successive revisions to the regulations have sought to make targets for waste reduction more challenging but also to reduce the impact of the regulations on small to medium enterprises (SMEs): currently, only those businesses with a turnover in excess of £2 million and over 50 tonnes of packaging handled per annum, are required to comply. It remains though a complicated undertaking for many organisations to which the regulations still apply.

SMEs are a significant and highly heterogeneous sector of commerce. Discounting micro-enterprises of less than ten employees, small and medium-sized organisations accounted for around 88% of UK enterprises in 2008 (URS, 2010). They are often constrained by factors that are not just related to their size, but also by issues that can be sub grouped within this sector such as their ownership status and whether they are for-profit or non-profit making (White and Lomax, 2011; White, Samson, Rowland-Jones and Thomas, 2009; Hillary, 2004). As such, SMEs present a complex and disparate array of organisations and circumstances that require considerate analysis (Hillary, 2004).

This case study of Carlisle Brake Products UK Ltd (CBP), a subsidiary of Carlisle Brake and Friction (CBF), outlines some of the key operational challenges faced by a manufacturing SME in the UK in meeting the requirements of the current packaging regulations.

**Context**

CBF is a leading solutions provider of high performance and severe-duty brake, clutch and transmission applications to OEM and aftermarket customers in the mining, construction, military, agricultural, performance street, motorsports, industrial and aerospace markets.

With ten manufacturing facilities globally located in the USA, UK, Italy, China, Japan, and Canada, and employing over 1,800 employees, CBF serves over 100 leading original equipment manufacturers in 55 countries.

The strength of CBF’s brands, including Wellman Products, Carlisle Industrial Brake & Friction, Hawk Performance, Japan Power Brake, VelveTouch, and Field Pro, gives customers access to a diverse range of the most highly engineered braking, friction, clutch and transmission products available to the market today.

CBP is located in Pontypool, South Wales. With an annual turnover of around £20 million it employs 94 personnel, and is ISO14001 and ISO9000 certified. The site manufactures a range of park and emergency brakes, hydraulic valves & adjusters, standard and boosted master cylinders, friction products, wind turbine brakes, drum brakes & spare parts.

**Implementation Costs**

The packaging regulations, in brief, require that a company demonstrate and report that it is reducing the amount of packaging that is used, minimising the presence of hazardous materials and maximising packaging material reuse and recycling. In order to do this it is necessary to
accurately and continually record all packaging materials that are received and used by the company.

Like many SME manufacturing organisations CBP has a broad international supplier and customer base, and due to its heritage has a diverse product range. The organisation currently employs in the region of 50 production suppliers and services 150 customers. The product range encompasses 300 finished assemblies composed of in excess of 700 individual component parts.

Between CBP’s original equipment manufacturing customers approximately twenty individual packaging specifications are stipulated. In addition to this, their aftermarket customers dictate the use of more than fifty separate packaging specifications. These specifications call for a wide range of materials to be used including wooden crates, reinforced cardboard boxes of various sizes, polythene bags, wooden skids and returnable wooden boxes.

Consequently, the management of incoming and outgoing packaging logistics is highly complex. This level of complexity precludes the use of a manual system for CBP and probably for most other organisations of this type as well, and suggests that a computer based information system be employed (Chaffey and White, 2010).

CBP operates a proprietary management information system that is prescribed by CBF and used across the group. This system currently has no UK based technical support and consequently the cost to adapt the system to incorporate the management of packaging materials is significant. In fact, the cost to modify and operate the system is estimated to be considerably greater than the total cost of recycling and disposing of its current packaging material waste: presently the company disposes of just under 50 tonnes of packaging materials per annum.

The organisation therefore finds it economically unjustifiable to report its detailed efforts toward reusing packaging materials and reducing packaging waste. Despite this it continues to attempt to recover and reuse much of the packaging material that it receives from its supply base thereby reducing the cost and environmental impact of recycling or removing materials to waste. The organisation is therefore making greater efforts to reduce its detrimental effect upon the environment than it might at first appear from the data captured by the EA.

Managing Packaging Throughout the Supply Chain

As a tier 2 supplier to several large global automotive companies much of the product packaging specification is determined by CBP’s customers. The need to adopt standard packaging crates and containers, often branded, largely prevents even the consideration of alternative packing materials and methods.

While many large customers utilise reusable crates and containers this is not always the case. Smaller and lower volume customers do not always specify packaging requirements. This has the beneficial effect of affording CBP the opportunity to reuse some packaging, received from their own suppliers, rather than introduce new packaging materials to the system. It is a
commendable action, being both cost effective for the organisation and resulting in a tangible reduction in overall packaging waste used in the supply chain. However, due to the prohibitive cost of measuring the total packaging used mentioned previously, this activity is not reported.

The power that is demonstrated by tier 1 customers over their supply base is, however, not replicated throughout the remainder of the supply chain. A significant proportion of CBP’s suppliers are providers of raw materials and producers of metal castings. Many of these suppliers are very large global enterprises for whom CBP form a fraction of their total turnover. Consequently, CBP possesses insufficient purchasing power to dictate packaging specifications, at least, not without incurring prohibitive costs.

Since EU Directive 94/62/EC forms the basis of efforts to reduce packaging materials within all European states it follows that all European suppliers, of qualifying status, will be working in some way toward reducing the materials that they use in their packaging: Caniato, Caridi and Moretto (2011) for example, find that the recovery of primary and secondary packaging is a common sustainable supply chain practice across a sample of organisations in the meat industry in Italy. It can therefore be expected that CBP may not need to drive the reduction of packaging materials used by its larger European suppliers. However, it remains to be seen whether those organizations will act in the best interest of themselves, and achieving their own local targets for waste reduction, or in the interests of their customer and achieving their local targets.

In order to take advantage of lower manufacturing costs, a further significant proportion of CBP’s suppliers are located in India, China, USA and other markets where EU Directive 94/62/EC does not apply. In these instances it is even more difficult to influence the packaging that is used, again not without incurring prohibitive costs. It is sometimes possible for CBP to reuse the packaging that has been used by their suppliers for their own outgoing packaging but this is not always the case. The physical demands of transporting heavy materials via sea and air-freight for example, impose their own constraints upon the minimum requirements for packaging materials (BusinessLink, 2011): CBP’s suppliers in India, China and USA for example are required to use wooden crates when shipping product via sea-freight. Furthermore, in order to maximise space-utilisation, the packaging that is employed by suppliers will be determined by the shape and quantity of items being shipped. Products with low and unstable demand therefore tend to be transported in packaging that suits the mode of transport and volume of parts being requested on a specific order. Similarly to CBP’s own efforts, the packaging may in turn be determined to some degree by the availability of reusable packaging materials that the suppliers themselves have received.

International supply chains are known to be sensitive to the effects of green initiatives that can disrupt normal operations (Wang, Chan, Yee and Diaz-Rainey, 2011). Consequently, due to being largely unable to dictate packaging specifications for much of its incoming supplies, the inflow of types of packaging materials is unpredictable. The organisation is therefore unable to plan to reuse these materials on a regular basis. If the incoming packaging materials are unsuitable for reuse then CBP finds itself liable for the cost of
recycling or removing this material to waste. Significantly, disposing of non-reusable and non-recyclable packaging materials that have been introduced to the supply chain by overseas suppliers may even result in packaging materials being buried in UK landfill sites.

The unpredictable inflow of packaging materials in turn affects the company’s ability to manage it’s stock of packaging materials effectively in terms of quantity stored, and potentially, the cost to purchase. It also introduces a wave of uncertainty around the packaging material availability throughout the remainder of the supply chain; customers of CBP that may have intended to reuse specific packaging materials may, on occasion, find that those materials are temporarily or no longer available.

It can therefore be seen that one organisation’s efforts to reduce waste by reducing or altering the packaging materials that it uses may in fact be depriving a later link in the supply chain from utilising those same materials. It can be construed that this may reduce an individual organisation’s packaging materials and packaging waste but does not necessarily result in the whole supply chain using the least possible, or least wasteful and harmful, array of packaging materials.

**Discussion**

The highly heterogeneous nature of SMEs that comprise a significant proportion of commerce, presents implementation difficulties for ‘one-size-fits-all’ regulations and approaches. Such difficulties have been highlighted in SMEs that are attempting to implement quality management systems (White, Samson, Rowland-Jones and Thomas, 2009) and environmental management systems (White and Lomax, 2011; Hillary, 2004). The Packaging Regulations employed in the UK appear to be constructive efforts toward driving the reduction of packaging materials and wastes (DTI, 2003) and steps have been taken to minimise the impact of those regulations on smaller SMEs. This examination of a UK based manufacturing SME however, identifies the economic and practical difficulties that are still faced by qualifying organisations during the implementation of those regulations: to quote CBP, “the philosophy is good but the execution is poor”.

Notwithstanding the benefit of being able to demonstrate itself as a socially responsible organisation, an ability that has been shown to have positive market value, the prospect of incurring fines is also known to be a factor that may encourage organisations to seek regulatory compliance (White and Lomax, 2010 & 2011). Failure to comply with the packaging regulations have, in some cases, met with fines in excess of £250k (Comply, 2011).

Although CBP is compliant with the current regulations, economic pressures prohibit the development of an information system that would enable the capturing and reporting of data about its efforts to reuse and recycle packaging materials. This lack of data must in turn affect the quality of the EA’s analysis and understanding of the packaging materials that are put into use and reused, recycled or moved to waste. Furthermore, while CBP is making every effort to reuse and recycle packaging materials where possible, it is failing to take advantage of the positive market value that may be
generated by being able to demonstrate its commitment to being a socially responsible organisation.

The Eco-Management and Audit Scheme (EMAS) is a voluntary system that aims to improve companies’ environmental performance beyond the levels required by legislation. Through the independent verification and disclosure of an annual statement of environmental performance and improvement, organisations are expected to gain “enhanced credibility and recognition” (IEMA, 2011). BS8555, the ‘guide to the phased introduction of an environmental management system’, outlines an approach toward the achievement of both ISO14001 and EMAS (IEMA, 2011). CBP is, as previously stated, ISO14001 certified and the pursuit of EMAS certification would therefore appear to be a logical progression for the organisation. It would then afford the opportunity to disclose the company’s efforts to reduce the quantity of packaging materials that is uses, recycles and moves to waste, to its key stakeholders via the annual statement. However, the pursuit of EMAS itself is a significant undertaking for an SME, and though it is a valuable knowledge-generating activity it has both cost and resource implications (White and Lomax, 2010 & 2011; Hillary, 2004).

Conclusion

This case study suggests that organisations are compelled to operate individually and may become self-interested when managing packaging material and packaging waste reductions. This is not to suggest that they operate in isolation. On the contrary, they are influenced and affected by external factors that are often beyond their control and it is these that inhibit them from acting cooperatively within the supply chain.

The current UK regulations drive the reduction of packaging materials and packaging wastes in the supply chain by imposing targets upon individual organisations. An SME’s ability to manage their packaging materials is often constrained by internal factors such as financial and human resource, but is also affected by supply chain conditions. Their relative position of power, the mode of product transportation, volume of product transported and to a lesser extent the form of the product itself may also determine the specification for the packaging materials that are employed. These internal and external constraints could affect an organisation’s ability to comply with regulations, and certainly limit its ability to continuously reduce the effect that its packaging materials have upon the environment.

The propensity to act individually within the supply chain is illustrated by this organisation’s inability to predict the availability of packaging materials. As incoming packaging is determined by the complex factors surrounding its supply base so the availability of particular materials becomes uncertain. In turn, the organisation becomes less able to maintain stable means of product packaging to some customers without purchasing and introducing further materials into the supply chain. It can be seen that each element of the supply chain is constrained in its ability to manage its packaging materials by a multitude of external factors that are largely beyond its control. Consequently, even though it may make every effort to reduce the packaging materials that it uses and waste that it produces, through necessity it is
ultimately consigned to adopting an individualistic and self-interested perspective. In doing so, it is possible that the entire supply chain becomes disconnected and can adversely affect normal operations (Wang et al, 2011).

This individualistic approach can also be argued to be failing to fulfil the ultimate aims of the Brundtland Report to achieve long-term reductions in our impact upon the environment. What is currently lacking from our efforts toward reducing the impact of packaging materials and packaging waste is a holistic view of the entire supply chain that considers the most effective packaging solutions for the entire supply chain rather than the most efficient solutions for individual organisations.

A report upon the impact of the packaging regulations (DTI, 2003) found that the UK packaging regulations had in fact stimulated the supply chain to cooperate on developing the most effective packaging solutions in some instances. It is notable however that this survey was based upon large and medium sized enterprises. This suggests that the propensity toward individualism is not specifically a product of the nature of the regulations but a feature of a particular type of SME. This serves to highlight the assertion that SMEs are a highly disparate group of organisation types that require detailed examination. It also suggests that the impact of the packaging regulations be further refined to support the needs and capabilities of SMEs that are a most significant sector of UK economy.

Future research should explore the impact of the packaging regulations upon SMEs with views to developing a typology of organisations and their associated packaging regulation implementation issues. In particular, there is a need to understand the factors that differentiate those organisation types that are unable or disinclined to engage in sharing responsibility for packaging material development with the rest of the supply chain for the greater overall benefit of the environment.

References


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