An investigation into the factors affecting the implementation of environmental labels by in-house industrial designers in UK SMEs

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An investigation into the factors affecting the implementation of environmental labels by in-house industrial designers in UK SMEs

By
Daniel Michael Horne

A Doctoral Thesis
Submitted in Partial Fulfilment of the Requirements for the Award of Doctor of Philosophy of Loughborough University

November, 2014

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ABSTRACT

Environmental labels on products and services have been increasingly significant in influencing consumer purchasing and represent a crucial communication of the environmental credentials of products and companies. Yet their importance to industrial designers, who are recognised as having significant influence over the environmental impact of products, is less known. The overall aim of this research project is to investigate factors affecting the implementation of UK environmental labels by in-house industrial designers in UK Small and Medium-sized Enterprises (SMEs). A review of the literature on industrial designers and environmental labels found that there was a gap in knowledge surrounding the factors affecting how and whether in-house industrial designers implement labels in their work, and what understanding they have. In response to the literature review a number of research questions were generated, which influenced the direction of this emergent, exploratory research. A Preliminary Study was set up to collect qualitative data from practicing industrial designers in UK SMEs on their recognition and use of environmental label schemes. A mock-up Resource was consequently developed that provided the information the Preliminary Study participants claimed to need. During the Main Study the Resource was used as an elicitation tool to further probe designers’ understanding and use of labels. Subsequently, three Case Studies were conducted with UK SMEs who have implemented labels on their products, to identify elements of best practice. The in-house SME designers in the study appeared to have knowledge of environmental label types and schemes. Both this and designers’ position within their companies especially in terms of their input on design briefs moderates their ability to implement labels. The cooperation and contribution of colleagues is also significant to the effective application including driving their use and being willing to include them in the product development process from early stages to impact on success or effectiveness. It is suggested that a whole company approach is needed. This thesis provides an original contribution to knowledge on in-house designers’ capability to implement labels; understanding of designers’ current knowledge and use of labels; and the role of designers in all SMEs, not just those engaged in ecodesign or using environmental labels.
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1 INTRODUCTION

This Chapter introduces the background to the research study and an overview of the thesis structure. The research aim, objectives and questions are also detailed.

Industry has been the predominant cause of environmental degradation over the last several hundred years. It has become increasingly accepted that businesses should acknowledge the influence they have on the wider community and their ethical responsibilities, to which companies have responded by actively promoting their environmental, social and ethical credentials (McDermott, 2007). What may be less clear is the extent to which industry values the need for products and their manufacture to be environmentally sensitive in order to work towards a sustainable future. Success in the market place is the ultimate goal of any product, regardless of its environmental credentials. Ultimately, eodesigned products have to sell in order to be of benefit to the environment and prove financially viable from a corporate perspective (Tischner et al., 2000).

Environmental labels are one response that industry (whether as a result of legislative instruction or demand from consumers for highlighting “greener” products) has used to draw attention to the efforts they have enacted towards more environmentally sensitive products. This study centres on industrial designers in UK SMEs working in-house and the factors affecting their implementation of environmental labels, but before this can be focused upon, it is useful to look on a broader scale at wider industry roles and the impetus that consumers and markets have given to consider eodesign thinking.

1.1 Background to the research

Long standing public concern for the environmental damage caused by industry intensified in many European countries during the 1980s through increasing
recognition and scientific evidence of problems such as the greenhouse effect and ozone depletion (Mackenzie, 1991; Proto, et al., 2007). Consumer awareness and understanding of the impact that human behaviour has on the environment was growing. This led to a demand for more environmentally sensitive products (Mackenzie, 1991). This led to efforts being made to reduce this impact by following environmental strategies, starting with “green design”, developing into “ecodesign” and evolving through to design for sustainability (Bhamra and Lofthouse, 2007). As early as 1991 Mackenzie claimed that increasing market-orientated approaches had transformed “eco-friendly” characteristics from a novelty to a necessity for the ever-expanding “green consumer” sector. More recently, Houe and Grabot (2009) considered that ‘with the emergence of a real customer awareness on environmental issues, the eco-friendliness of a product may become a competitive advantage’ (p.35-36).

Today, 40 percent of European consumers indicate a willingness to purchase environmentally friendly products regardless of price; and almost half actively save energy or reduce their carbon footprint (Nielsen, 2014). These figures have shown an increase each year recently (Nielsen 2013; 2014). In the UK, these figures are a little lower, with a quarter of UK consumers would take the green option even it cost more money; this was an increase from eight percent 17 months earlier (Nielsen, 2013). Nielsen’s (2007) report on British consumers reported a greater concern for environmental issues among younger adults and those with young children, across all socio-economic groups.

One response by manufacturers to this perceived consumer demand has been the introduction of environmental labels (Mackenzie, 1991; Harris and Cole, 2003). An environmental label is a visual method companies and manufacturers use to display the environmentally preferable features of a product in the marketplace (Goggin, 1994). Environmental labels have been used since the late 1970’s. These labels were ‘prompted in part by the generally poor performance of industry in providing enough information concerning the environmental credentials of products’ (Erskine and Collins, 1997, p.125). There are many different types of environmental labels in operation around the world and their use has increased in the last few decades (Global Ecolabelling Network (GEN), 2004) and their numbers have continued to increase (Allen,
2000; Rubik and Frankl, 2005). These schemes vary greatly and range from national to multinational, optional to mandatory, and third party certified to self-declarations. In recent years growing concerns about climate change and environmental deterioration has seen an increase in the popularity of labels (UNOPS, 2009).

Environmental labelling is also claimed to encourage industry to produce more environmentally sound products through harnessing consumer awareness and interest in environmental issues (Erskine and Collins, 1997; Galarraga Gallastegui, 2002; Edser, 2009). Esty and Winston (2006) argue that Small and Medium-Sized Enterprises (SMEs) are well placed to adopt environmental labels because they are nimble, able to change and in some cases have niche markets. Literature on the relative success or failings of environmental labelling schemes in the past has tended to focus on elements such as market share, consumer awareness, and responsibility (e.g. Erskine and Collins, 1997; de Boer et al., 2003; Rubik and Frankl, 2005; Bruce and Laroiya, 2006).

This research project focuses specifically on in-house industrial designers working in UK SMEs. Goggin (1994, p.459-460) said of the relationship between designers and environmental labels,

‘Given the role of designers in the development of ecolabelled goods […] ecolabelling could increasingly impact on product design’.

Designers play an important role in the Product Development Process (PDP) where over 80% of product-related costs and environmental impacts are thought to be predefined (Directive 2009/125/EU). As Galarraga Gallastegui (2002) states:

‘It is obvious that once the goods [product] are produced, designed and delivered into the market, there is not much that can be done to avoid environmental damage’ (p.317).

This gives a sense of the responsibility that Fabrycky (1987) claimed designers may have in their role within the PDP. Press and Cooper (2003) mention the
notion of designers being “responsible citizens”. In addition it has also been suggested that ‘[d]esigners can directly influence the decisions people make about what they buy and when’ (Bhamra and Lofthouse, 2007, p.37). This could be further enhanced as designers are also becoming involved in the marketing and branding of products (Design Council, 2007; McDermott, 2007).

Despite this valuable role for designers and Goggin’s 1994 prediction, there remain gaps in the knowledge concerning how environmental labels are implemented by designers. This is the focus of this research project.

1.2 Green markets and marketing

The rising concern of people towards environmental degradation translated into action through voting preferences, subscription to environmental campaign groups and organisations, incorporating recycling and energy efficiency into their routines, and using their purchasing decisions to demonstrate their desire to reduce negative environmental impacts has been recognised for many years (Mackenzie, 1991). Houe and Grabot (2009, p.35-36) consider that ‘with the emergence of a real customer awareness on environmental issues, the eco-friendliness of a product may become a competitive advantage’. Ecodesign needs to reach more than niche markets in order to achieve significant environmental impacts (Deutz et al., 2013). Environmental labels need to inspire ecodesign to inspire change. Awareness and demand from consumers created “green” markets and as a result, it is thought, more companies and designers have changed their practices. If consumers value the steps taken by a firm to protect the environment, they may be willing to pay a premium for the product, thereby creating a “market” for environmental protection (Bruce & Laroia, 2006). In 2007, at the beginning of this research project, the ‘eco-market’ in the UK had been growing steadily and was valued at £30 billion a year (Kalmus, 2007). The Nielson (2007) Homescan Survey of shoppers in the UK found almost half (46%) of all respondents agree that is it worth paying extra for products that are ethically produced or kinder to the environment. Nielson (2007) also identified that the most important environmental and ethical
Concerns of the majority of British shoppers are being able to buy local products, products with minimum packaging and energy efficient appliances. More recently, a survey of UK consumers found around one in four said they are prepared to pay more for environmentally friendly products (Fletcher and Downing, 2011a). Results from (Nielsen, 2013) show a European average of 49% of consumers claim that they want to save energy and reduce their carbon footprint, behind a global average of 58%. In the same study, 46% of consumers surveyed globally claim that they buy environmentally friendly products regardless of price, with a European average of 37%.

Despite this steady growth in the demand from individuals and consumer groups for more to be done by companies regarding the environment, the actual level of demand is difficult to gauge accurately (Bruce & Laroiya, 2006). It has been possible to ascertain which environmental issues are of greater concern to the public, but measuring the strengths of their preferences is difficult to quantify. It is this inability to accurately measure consumer preferences that poses a fundamental problem to those responsible for developing environmental policy (Bruce & Laroiya, 2006), and it should be said, for designers or others in industry to fully comprehend the worth of making environmentally sensitive decisions in their product performance and manufacture.

At the close of this project in 2014, research on the economic downturn had not yet been produced in bulk to be able to find evidence of changes in consumer propensity to purchase environmentally sensitive products. Yet Nielsen’s Global, Socially Conscious Consumer report (2012) seemed to suggest little change, or a return to pre-2008 global recession levels when it reported that nearly half of the consumers they surveyed globally would be willing to pay extra for products that they saw as responsible. A 2012 Harris Interactive poll in the USA suggests a small decline in overall “green” behaviours since their last comparable poll of 2009. This includes being less likely to reuse things (and more likely to buy new); to make an effort to use less water; to buy food in bulk or buy organic products. The Harris Interactive poll also concluded that there are few ‘true blue greens’, consumers who always buy green – but this may be
difficult if some product sectors have few “green” products. Additionally it may not necessarily be productive to talk about “green” consumers when there may well be many consumers who will sometimes but not always chose a green alternative, and make complex buying decisions (Rex and Baumann, 2006). Pedersen and Neergaard (2006) pointed out the complexity of consumer values and behaviour that might contribute to the idea of a green consumer, but that might not mean a consumer consistently purchases in an environmentally friendly way.

**Greenwashing**

Early in the days of consumer interest in the environment some companies viewed the situation as a short-term marketing opportunity. This was achieved by exploiting consumers’ lack of knowledge about environmental issues through dramatic claims about “green” and “environmentally friendly” products which only had minor improvements, if indeed any at all. These claims were often advertised through large green labels proclaiming these apparent credentials (Mackenzie, 1991). This kind of approach, together with other similar practices, became more commonplace through the 1980s and 1990s. These types of exaggerated and often unsubstantiated environmental claims became collectively known as “greenwashing”. A definition of “greenwashing” is:

‘Greenwash – verb: the act of misleading consumers regarding the environmental practices of a company or the environmental benefits of a product or service.’ (TerraChoice, 2007 p.1)

A 2007 report produced by TerraChoice (an environmental marketing firm) found that the activities of companies who were guilty of greenwashing fell into six categories that they named “sins”. A second report published by TerraChoice (2009) noted the emergence of a seventh “sin”, being the ‘Sin of Worshiping False Labels’. Environmental labels and environmental marketing messages might not be trusted by consumers as a result of the proliferation of these sins (D’Souza, 2004). An explanation of each is given in Table 1.1.
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<tr>
<td>Sin of hidden trade-off</td>
<td>&quot;Energy Efficient&quot; electronics that contain hazardous materials</td>
</tr>
<tr>
<td>Sin of no proof</td>
<td>Shampoos claiming to be &quot;certified organic&quot; but with no verifiable certification</td>
</tr>
<tr>
<td>Sin of vagueness</td>
<td>Products claiming to be &quot;100% natural&quot; when many naturally-occurring substances are hazardous</td>
</tr>
<tr>
<td>Sin of irrelevance</td>
<td>Products claiming to be CFC-free, even though CFCs were banned 20 years ago</td>
</tr>
<tr>
<td>Sin of fibbing</td>
<td>Products falsely claiming to be certified by an internationally recognised environmental standard</td>
</tr>
<tr>
<td>Sin of lesser of two evils</td>
<td>Organic cigarettes or &quot;environmentally friendly&quot; pesticides.</td>
</tr>
<tr>
<td>Sin of worshiping false labels</td>
<td>Products that, through either words or images, give the impression of third-party endorsement where no such endorsement actually exists. Fake labels, in other words.</td>
</tr>
</tbody>
</table>

Table 1.1 The Seven Sins of Greenwashing (adapted from TerraChoice 2007; 2009)

Marketing of ecodesigned products has moved on thanks to a combination of consumers becoming more knowledgeable about environmental issues and some companies being proactive to outline their good work. Industry-wide labels, and in particular third-party certified labels, attempted to restore trust and add credibility in environmental claims and declarations made by companies. Although the situation has improved, the damage to consumer confidence remains through mistrust and general scepticism of what companies claim (McDermott, 2007).

1.3 Introduction to environmental labels

Environmental labelling has been a response by manufacturers to the recognition that human activities are having a negative impact on the environment. Although the idea of industrial designers creating products with reduced environmental impacts first emerged in the 1960s (Papanek, 1972) manufacturers were slow to embrace this concept.
In 1994 Goggin defined an environmental label as being a visual method that companies and manufacturers use to display the environmentally preferable features of a product in the marketplace. Environmental labels are a response to the proposed demand from consumers to know information about the environmental credentials or impacts of products on the environment. Because consumers claimed they wanted this, and seemed willing to pay a premium for products with this information, it created the green market. Environmental labels ‘…aim to establish a reliable and trustworthy information system on product features. They are based on the belief in the rational behaviour of the target groups and the influence this rationality has on decision-making’ (Rubik and Frankl, 2005 p.30). More recently, environmental labels have become ‘…a widespread communication tool with the aim of providing professional and private consumers with information on the environmental characteristics of products and services’ (Rubik and Frankl, 2005 p.29). Houe and Grabort (2009) claim that ‘the new awareness of the consumers regarding environmental issues should allow companies to gain a competitive advantage by obtaining eco-labels which certify the low impact of a product on the environment’ (p.21).

There are many different types of environmental labels and schemes in operation around the world and their use has increased in the last few decades (Global Ecolabelling Network (GEN), 2004). These schemes vary greatly and range from national to multinational, voluntary to mandatory, and third party certified to self-declarations. To date, there are currently 458 eco-labels listed on ecolabeindex.com (November 2014).

This project is concerned with labels, symbols and schemes, both voluntary and compulsory, that present information connected to environmental or social issues and are in operation in the UK. To clarify, this means environmental labels, symbols and schemes that are relevant and applicable in the UK to products sold in UK markets (not necessarily solely in UK markets). The scope of these labelling schemes varies from UK-only to European-level and global. In addition, three labels not applicable in the UK are included because they are significant labels within the EU, which will be explained in later in this chapter.
1.3.1 Types of Environmental Labels, Declarations and Schemes

There is a vast range of environmental labels currently in operation with some directly descended from internationally agreed standards, others resulting from multi-national legislation, government initiatives or industry recommendations, down to marketing firms and even individual companies. However, all environmental labels share the same common objective: ‘to promote environmental improvement’ (Rubik and Frankl, 2005, p.78).

One of the key issues identified in the literature is the need to define and group different types of labels in order to accurately understand the environmental labelling landscape (Galarraga Gallastegui, 2002; Rubik and Frankl, 2005). There have been several attempts to categorise environmental labelling in the past. Examples include that of the US Environmental Protection Agency (US EPA 1998), de Boer (2003), ISO 14000 Environmental Management System Group (2003), Rubik and Frankl (2005), Horne, (2009).

The International Organisation for Standardisation (ISO) created a ‘family’ of Environmental Labels and Declarations with the standard ISO 14020, which provides guidance on the goals and principles that should frame all environmental labelling programs and efforts, including, practitioner programs and self-declaration (ISO 14000 Environmental Management System Group, 2003). Defined within this are Type I eco-labels, Type II self-declaration claims (also known as “green” labels and claims), and Type III environmental declarations through information labels (GEN, 2004). Both the Department for Environment, Farming and Rural Affairs (DEFRA) and the Global Ecolabelling Network (GEN) make a clear distinction between Type I eco-labels that are third party certified, and Type II green claims and labels that are self-awarded by a company to their own product to raise awareness of the product's environmental credentials. Type III labels assess various criteria associated with a product throughout its lifecycle, resulting in a quantifiable outcome that allows direct comparison between similar products. Another form of differentiation suggested by de Boer (2003) was to group labels by the type of
certification: First-party: by the company itself (self-certification); Second-party: industry-related associations or the country of origin; Third party: independent third party.

However, Rubik and Frankl (2005) point out weaknesses in both of these classification approaches and proposed their own (see Figure 1.1). They explain that the ISO 14020 family of labels does not take into account the entire spectrum of environmental labels. It does not consider ‘…instruments such as obligatory labels, test reports and trademarks, and other interesting issues that are of some importance, such as social affairs, are not included’ (p.33). In the opinion of Rubik and Frankl (2005) the classification of environmental labels should firstly focus on the compulsory compared with the voluntary approach of the schemes as the first and principal level of differentiation. They pointed out that compulsory labels are always independently third-party certified, whereas voluntary labelling can be both first-party and third-party certified, making de Boer’s approach inaccurate. Another significant feature of Rubik and Frankl’s classification model was the division of ISO Type I labels into two sub-categories of ‘Classical ISO Type I’ and ‘ISO Type I-like’. This will be explained after an introduction to Life Cycle Assessment (LCA) which both of these label types use.
Life Cycle Assessments (LCAs)

As many of the environmental labels which are to be outlined below have awarding criteria based upon a Life Cycle Assessment (LCA), it is best that a description and their relevance to environmental labelling be provided at this point. An LCA is defined by ISO 14040:2006 as a ‘compilation and evaluation of the inputs, outputs and the potential environmental impacts of a product system throughout its life cycle’ (p.2). The same standard also defines life cycle as the ‘consecutive and interlinked stages of a product system, from raw material acquisition or generation from natural resources to final disposal’ (ISO 14040, 2006, p.2). This is sometimes also referred to in literature as a Life Cycle Analysis, however they do not distinguish a different definition to that given above.

Today numerous examples of LCA tools are available on the market, mostly taking the form of professional software such as SimaPro. If conclusive, a complete LCA can be a very useful tool for ecodesign by informing the design...
process, but is rarely used in the conceptual design phase (Eisenhard et al, 2000) or product development phase as it requires a lot of time, and therefore money (Eisenhard et al, 2000; Tischner et al., 2000; Bhamra and Lofthouse, 2007) and considerable quantities of data are not available (Giudice et al, 2006). Indeed, this can be especially true for SMEs who are less likely to have the resources and expertise required to use LCA tools (Le Pochat et al., 2007; Prendeville et al., 2011). Therefore, streamlined versions of LCA have been developed, with approaches such as reducing the number of indicators used or using a more qualitative approach (Lewis and Gertsakis, 2001). In 2006 Giudice et al. specified three main categories into which the various methods and tools currently used in design practice fall into: complete, simplified and feature-specific LCAs. The concept of LCA has also become as much a way of thinking as a specific tool or methodology, which ‘allows the product designer to consider and design around the broader environmental implications of the product’ (Lewis and Gertsakis, 2001, p.41-42). This is also known as Life Cycle Thinking (LCT).

As predicted by Neitzel in 1997, LCA has been used as a tool for more accurate and scientific forms of environmental labelling. Some environmental label certification criteria are based on several aspects of a product e.g. Type I labels, whereas others only focus on a single impact e.g. Type I-like labels. So now that the role of LCAs in environmental labelling schemes has been introduced, an explanation of the different classifications of environmental labels and examples are given below.

1.3.1.1 Type I

ISO 14024 covers labels known as Type I, also known as ecolabels or eco-labels. These claims are based on criteria set by a third-party, being based on the product’s life cycle impacts. The awarding body may be either a governmental organisation or a private non-commercial entity. Products awarded this type of label meet minimum environmental impact criteria (Allison & Carter, 2000). This is only done following the successful completion of the
rigorous certification process through which specific environmental criteria are examined. Houe and Grabot (2009) defined generic content amongst all Type I labels (see Table 1.2).

1. Introduction, stating the basics of the eco-label
2. Guidelines for Product Design
   2.1 Design principles
   2.2 Design for waste reduction and for reuse of the product and its components
   2.3 Design for disassembly and recycling
   2.4 Consistence with a retirement national system
3. Characteristics of the materials and components
   3.1 Simplification of the content of materials
   3.2 Contamination of recyclable materials
   3.3 Use of recycled and recyclable materials
4. Services linked to the product retirement and recycling
5. Furniture of information and data for end of life management
   5.1 Instructions to users concerning end of life
   5.2 Information for end of life managers
   5.3 Materials labeling
6. Methods for getting continuity in conformance
   6.1 Certification of an environmental management system

| Table 1.2 Generic content of eco-labels (Houe and Grabot, 2009, p.23) |

The voluntary process of applying a certifiable eco-label to a product is known as “eco-labelling”. “Eco-labelling” refers specifically to the ‘provision of information to consumers about the relative environmental quality of a product’ (GEN, 2004 p.2). They are multi-issue, only being applied to the top 5-30% of products in any category to signify selectivity (OECD, 1997). Participation in all of these schemes is voluntary and they are independently approved. The ecological criteria for each product group are different and based upon a LCA which identifies the stages that cause the greatest environmental impact (Erskine and Collins, 1997).
Three Type I schemes are of particular significance: The Blue Angel Ecolabel, The Nordic Ecolabel, and the EU Ecolabel. The reasons why these are of significant importance are explained next.

![The German Blue Angel Ecolabel](image)

The German ecolabelling scheme, known as the Blue Angel Ecolabel, was introduced in 1978. It is the oldest and one of the most widely recognised Type I eco-labels in existence. The process behind the assessment and award reassures consumers, as they can rely on the Blue Angel being kept up-to-date environmentally and not being influenced by individual economic interests (RAL, 2008). One of the successes of the Blue Angel has been the way in which it has improved standards by repeatedly raising the benchmark and developing more comprehensive environmental criteria that products are required to meet in order to be awarded the label. It has also been recognised by other countries as a trustworthy label, with numerous countries have based their own national environmental labelling schemes on the Blue Angel model (RAL, 2008). The Blue Angel is currently applied to 12,000 products from 1,500 companies (Federal Ministry for the Environment, 2014). The Blue Angel continues to be increasingly used in international marketing, with the label benefitting from both the good reputation of German environmental policy and the perceived quality of a product labelled “Made in Germany” (Federal Ministry for the Environment, 2014).
The Nordic Ecolabel (also known as the Nordic Swan Label) is a voluntary ecolabelling scheme introduced in 1989 by the Nordic Council of Ministers. The significance of this label is that it was the first to be adopted by multiple countries. The scheme currently operates in Norway, Sweden, Denmark, Finland and Iceland, with each of the five countries having its own ecolabelling organisation to manage the scheme. Products and services are awarded the Nordic Ecolabel providing they satisfy the specific product criteria. The criteria, including environmental and social factors such as free trade, are revised every three years and companies are required to reapply for a licence to display the label which ensures that products are continually being developed with reduced environmental impacts. It is well established and has proved popular with consumers following investment in education and publicity, and is increasingly a requirement of government procurements (Nordic Ecolabelling Board, 2012). A recent Nordic market survey showed that in the Nordic countries 94 percent recognised the Nordic Swan trademark as an Ecolabel (Nordic Ecolabelling Network, 2014).
The European Union Ecolabel (often referred to as the Eco-Flower because of the label design) was established in 1992 to provide a recognisable and credible environmental label across all countries in the EU, partly in response to the growing number of national schemes. It is a voluntary scheme and the label is awarded by impartial third-parties to products and services which have a lighter environmental footprint than similar products performing the same function. It is the only Type I scheme currently in operation within the United Kingdom. DEFRA is responsible for awarding the scheme in the UK. Despite its operation, the EU Ecolabel has not interfered with the development of national environmental labelling schemes (Supino 2000 cited in Proto et al., 2007) and it runs alongside national schemes such as the Blue Angel and the Nordic Swan. This kind of association with other established and successful schemes was thought to help raise the awareness, recognition and trust in the scheme. Just after its introduction Goggin claimed that ‘it is widely believed that a harmonised European wide ecolabelling scheme, endorsing best environmental option, is a ‘good thing’.’ (Goggin, 1994, p.459). Around the same time, Hillary (1995 cited by Erskine and Collins, 1997) considered the adoption of the market-based EU Ecolabel to be the most innovative development in EC environmental policy to date.

The EU Ecolabelling scheme has two main aims. The first is to promote products and services with reduced environmental impacts throughout their life cycle. The second is to provide consumers with clear information about the environmental impacts of products and services (European Economic Communities 1992 cited in Erskine and Collins 1997). A product can only be considered for the EU Ecolabelling process if it falls under an existing product group category. These product groups are primarily based on proposals made by industry, and range from frequently purchased consumables such as toilet paper, light bulbs and dishwashing detergents through to occasional major purchase products such as televisions, personal computers and mattresses. In 2012 a total of 1,616 products had been issues the EU Ecolabel in the UK (EC, 2014).
1.3.1.2 ‘Type I-like’

**Single Issue Labels** are a fourth group (in addition to the three defined by the ISO) described as “Type I-like” (Rubik and Frankl, 2005; UNOPS, 2009). This is because they are similar to Type I labels in that they are based on criteria set by a third party and are multi-issue, being based on the product’s life cycle impacts.

‘ISO Type I-like labels are labels that contain not most but major elements of the ISO Type I standard (e.g. requiring third-party verification and based on multiple criteria)’ (Rubik and Frankl, 2005, p.53).

However, they only focus on one negative environmental impact. These labels can be awarded based on a pass/fail basis e.g. maximum energy usage for electrical appliance; graded performance within product range; or guarantee of responsible resource management e.g. sustainable forests. They are useful for targeting specific problems (UNOPS 2009). These labels are still subject to some of the regulations in ISO14020 – General Guidelines for Environmental Claims and Declarations (Allison & Carter 2000; UNOPS 2009). Some relevant single issues labels are introduced below.

![Forest Stewardship Council (FSC) Label](https://www.fsc.org/)

**Figure 1.5 Forest Stewardship Council (FSC) Label**

The Forest Stewardship Council’s (FSC) are an international non-profit organisation dedicated to promoting responsible forestry activities (FSC, 2014). The FSC “tick tree” logo was established in 1993 as a response to concerns over global deforestation. An FSC label applied to timber and other wood based products indicates that it is made with, or contains, wood that have come from
sustainably managed forests or from post-consumer waste. Only when both forest management and supply chain meet the FSC requirements can wood producers and paper suppliers use the FSC logo. The FSC checks applications with the help of independent accredited certification organisations/bodies which represent FSC nationally in more than 50 countries (FSC, 2014). There are three types of FSC label: 100%, FSC Mix and FSC Recycled. Fletcher and Downing’s (2011b) research on UK consumers’ recognition of labels noted high levels of familiarity with the FSC label, possibly because of its use on a wider range of products, with over a quarter of respondents claiming the logo was either very familiar or fairly familiar. Two fifths of those who had seen the label before were able to providing an accurate explanation of what it might mean.

![PEFC Label](image)

**Figure 1.6 Programme for the Endorsement of Forest Certification (PEFC) Label**

The Programme for the Endorsement of Forest Certification schemes (PEFC), originally called the Pan European Forest Certification scheme, is an independent voluntary private-sector initiative started as a regional scheme covering Europe (but is now used in countries around the world). It aims to provide assurance to the customers that the wood and paper products they buy come from independently certified sustainably managed forests.

![Carbon Reduction Label](image)

**Figure 1.7 Carbon Reduction Label**
The Carbon Reduction Label helps consumers see at a glance which companies are working to reduce the carbon footprint of their products. It is independently verified by the third-party Carbon Trust Footprinting Certification Company which helps to ensure measurements are robust, credible and give integrity to company claims. The carbon footprint of a product is calculated through every stage of the product’s lifecycle using an LCA, which can also help companies identify hidden opportunities for efficiencies and carbon savings within operations and supply chain (Carbon Trust, 2014). Successful applicants are granted permission to use the label on packaging and promotional material, although, every two years a product must be reassessed and if a reduction has not been achieved the label is removed (Carbon Trust, 2014). In 2010 90% of households bought a Carbon Trust labelled product (Carbon Trust, 2014).

![Energy Saving Recommended logo](image)

**Figure 1.8 Energy Saving Recommended logo**

The Energy Saving Recommended logo is a voluntary scheme in the UK for certain energy using products. The labelling scheme is run by the Energy Saving Trust and requires producers who wish to use the label to submit products for compliance testing to ensure they meet the requirements of the scheme and to commit to improving energy efficiency of their products in the future (Energy Saving Trust, 2014).

1.3.1.3 **Type II**

**ISO 14021** covers labels known as **Type II**. This type of label are also known as “green claims” (DEFRA, 2003) or “environmental claims” (UNOPS 2009) as they are based on self-declarations by manufacturers or retailers of the
environmental aspects of its products and services. It does not even have to be a label – it could be a phrase. The standard provides guidance on the terminology, symbols, testing and certification methodologies that these organisations should use. There are numerous examples of such claims e.g. “made from x% recycled material” (Allison & Carter 2000). These labels are certifications made by manufacturers or retailers without evaluation from a third party. Many companies have made their own labels. Tend to focus on single aspect of product such as “made from 90% recycled content” (see Figure 1.9) or “biodegradable”. These may be based on a LCA but this is rarely the case. These can feature established free to use recycling symbols (these are explained in more detail later in this section). It is important to remember that these declarations are made by the manufacturer or retailer and are not independently verified by a third party.

![Figure 1.9 Example of a Type II label](image)

1.3.1.4 **Type III**

**ISO 14025** covers labels known as **Type III**. These claims consist of quantified product information based on life cycle impacts. This form of labelling is also known as ‘environmental product declaration’ (EPD) (e.g. Sibilio, 2003 cited in Proto et al., 2007). These impacts are presented in a form that facilitates comparison between products, for example through a set of parameters. However, there is no comparing or weighting against other products inherent within a claim (Allison & Carter, 2000). Type III labels are not investigated in this research project because there is no EPD system in the UK.
1.3.1.5 “Other” voluntary

Although not recognised under the four types mentioned above, information about the effects that products and services have on the environment are also displayed through alternative labels. These fall under different International Standards responsible with the reporting of various statistics. These differ from the ISO14020 types as they usually only include a single assessment attribute (Goggin 1994). There is often no set method or form in which this information should be displayed. Some companies and associations have chosen to display this information, at least in part, by developing a labelling scheme. Non-ISO related labels include labels that are directly related to European Union (EU) Directives, standards set by the British Standards Institute (BSI), various initiatives produced by DEFRA, and various proposals from trade and industry associations.

1.3.1.5.1 Social labels

‘During the last decade there has also been a global development of social and ethical labels.’ (Bratt et al., 2011)

Social labels, also known as ethical labels, denote social or ethical aspects of a product. They enable consumers to factor social issues such as human rights, workers’ rights, and fair prices paid to producers in developing countries into their purchase decisions (de Boer, 2003). Two long running social labels in operation in the UK which enjoy strong market share and consumer trust are described below:

Figure 1.10 FAIRTRADE Mark
The FAIRTRADE Mark is a registered certification label for a wide range of products sourced from marginalised producers and workers in developing countries. It contributes to sustainable development by offering better trade conditions such as long-term trading contracts, a price that covers the cost of sustainable production and living, and investments in social and environmental projects benefitting the communities of farmers and workers. For a product to display the FAIRTRADE Mark it must meet international Fairtrade standards which are set by the international certification body Fairtrade Labelling Organisation International (FLO), a non-profit multi-stakeholder association involving 23 member organisations. These standards are agreed through a process of research and consultation with key participants in the Fairtrade scheme, including producers themselves, traders, NGOs, academic institutions and labelling organisations such as the Fairtrade Foundation (who are responsible for awarding the FAIRTRADE Mark in the UK). Fairtrade labelled products have been enjoying increasing recognition (Nielsen, 2007, 2012).

![Rainforest Alliance Certified label](image)

**Figure 1.11 Rainforest Alliance Certified label**

The Rainforest Alliance Certified seal label appears on products that have been made or grown sustainably such as timber and paper. This means that production must satisfy aspects of sustainability such as protection of the environment, decent working conditions and respect of local communities. It is awarded to products following a comprehensive certification process that promotes and guarantees improvements in agriculture and forestry by working with foresters, farmers and tour operators. The Rainforest Alliance Certified seal is internationally recognised. Forestry businesses that comply with the rigorous standards of the FSC may use the Rainforest Alliance Certified seal in conjunction with the FSC logo. The Rainforest Alliance also issue the Rainforest Alliance Verified mark for tourism companies who demonstrate progress towards minimising their environmental impact and supporting local workers.
and communities (Rainforest Alliance, 2014), however, this is not considered in this project.

1.3.1.5.2 Recycling Symbols and schemes

Recycling Symbols or logos convey information about a product or packaging related to recycling. These are symbols and schemes that often appear on products and packaging. However, these should not be confused with environmental labels. They give indications on how a product could be recycled, but they do not mean that products will be recycled if put in local household collection or that the product contains any recycled content. The first three detailed below can all be used as Type II as well.

![Universal Recycling Symbol](image)

**Figure 1.12 Universal Recycling Symbol a.k.a. Möbius Loop**

The universal recycling symbol is an internationally recognised symbol used to indicate a material as recyclable. It is also known as the Möbius Loop. The three arrows represent the three stages of the recycling process: collection, re-manufacture into new product, and re-use. However, just because a product carries this symbol it does not mean that it will actually be recycled at the end of its life. The symbol is not trademarked which is why it appears in many different forms. It is free to use although its use is restricted if it were to be misleading or deceptive, for example, if applied to products that cannot be recycled. If the Möbius Loop contains a percentage number, it indicates that the product is made with that percentage of recycled material (for example, see Figure 1.9 on p.16). The symbol has also been adapted to impart other information about a product, such as for identifying plastics (see below).
The Society of the Plastics Industry (SPI) developed the SPI resin identification coding system in 1988. It is a set of symbols placed on plastics to identify the polymer type. They are clearly based on the universal recycling symbol. They are used internationally to aid sorting and separation of different polymer types for recycling.

![Figure 1.13 SPI Resin Identification Codes](image)

The international Tidyman logo is copyright free, in the public domain, and available for anyone to use when campaigning on litter issues. The 'Tidyman' logo, often accompanied by a message to 'dispose of waste thoughtfully', is used by many companies on their product packaging to encourage people not to litter.

![Figure 1.14 International Tidyman Logo](image)

The On-Pack Recycling Label (OPRL) scheme was launched in March 2009 in response to research by WRAP (Waste & Resource Action Programme) which
identified a need to better communicate to consumers what types of packaging can be recycled. The scheme has been developed by the British Retail Consortium (BRC) and WRAP for retailers and brand owners. Under the scheme packaging can be labelled as ‘widely recycled’, ‘check local recycling’, and ‘not currently recycled’ according to what the majority of local council kerbside collections currently take, which is updated annually. Special labels have also been created for packaging collected at collection points such as plastic films and plastic carrier bags. The label scheme uses the already established Recycle Now ‘swoosh’. This standardised approach is aimed at making consumers more familiar with recycling information and avoiding confusion and frustration which was identified. WRAP also work with Local Authorities to increase recycling rates for materials that could be recycled but currently have a low collection and recycling rate. In 2014 over 150 organisations had signed up to the scheme with the label being applied to over 75,000 products (On-Pack Recycling Label, 2014), eliminating many of the recycling labels previously created by individual companies. The scheme is run by the not-for-profit company OPRL Ltd set up by BRC, with organisations who sign up only being asked to pay a small donation towards the running of the scheme. This is a voluntary scheme which ensures that the proposal does not conflict with the EU Packaging and Packaging Waste Directive 94/62/EC.

Figure 1.16 Green Dot

Although the Green Dot symbol is commonly found on products and packaging it is not a recycling symbol. It has been included here because it is so often mistaken for meaning that a product is recycled or recyclable. The Green Dot is actually a trademark used to show that the producer of the product has paid a fee to be included in an industry-based recovery and recycling system for packaging on consumer products. The Green Dot scheme is covered under the
European "Packaging and Packaging Waste Directive - 94/62/EC", which is binding on all companies if their products use packaging and requires manufacturers to recover their own packaging. According to the directive, if a company does not join the Green Dot scheme, they must collect recyclable packaging themselves which is almost always impossible for mass produced products. This is a Europe-wide scheme, but the UK does not participate in it. Nevertheless, the Green Dot still appears on many products in the UK and has been reported as causing much confusion for UK consumers who mistake its meaning as "recycled" or "recyclable".

1.3.1.6 Compulsory Labels

These compulsory labels are different from all the voluntary labels listed so far. However, these are included as they are important because they must be applied to products. Included within this are energy efficiency labels for products, which just focus on the single aspect. These labels are all required on specific products by law. Here is a selection:

![Figure 1.17 Waste Electrical and Electronic Equipment (WEEE) logo](image)

Introduced in January 2007 the Waste Electronic and Electrical Equipment (WEEE) Directive (2003/108/EC) aims to reduce the amount of electrical and electronic equipment being produced and to encourage everyone to reuse, recycle and recover it. The WEEE Directive also aims to improve the environmental performance of businesses that manufacture, supply, use, recycle and recover electrical and electronic equipment. In the UK all importers, rebranders and manufacturers of new electrical or electronic equipment need to
comply with the UK's WEEE Regulations which in part implement the WEEE Directive. To ensure that they comply they must register on a producer compliance scheme. Some of these may also have obligations under the WEEE Regulations if they are a business with electrical or electronic equipment to dispose of, or if they sell electrical or electronic equipment. The WEEE logo must be applied to all electrical and electronic products and associated packaging to inform consumers that they should not dispose of the product in the general domestic waste stream. Instead, local council refuse and recycling centres have drop-off points for WEEE products to be processed and recycled.

![CE Marking](image)

**Figure 1.18 CE Marking**

The CE marking, also known as CE mark and CE sign, is a mandatory mark on many products sold on the single market in the European Economic Area. By placing the self certification CE marking on a product the manufacturer declares that it meets EU safety, health and environmental requirements, which enables the free movement of products within the European market. Although not technically an environmental label, the CE mark does include environmental criteria which must be satisfied. Products which are required to comply with the Energy-related Product (ErP) Directive 2009/125/EC, which replaced the previous Energy-using Product (EuP) Directive, will display the CE Marking if the product satisfies minimum safety and energy efficiency requirements.
The European Energy Label is mandatory in the EU on certain types of products including washing machines, ovens, refrigerators and freezers. The label presents the energy efficiency of household appliances on a scale from “A” to “F”, with “A” being the most efficient, to allow consumers to make a comparison among products. However, as standards have risen, higher ratings of “A+” and “A++” have had to be introduced for several products. The label is also considered a driver for manufacturers to produce more energy efficient products. DEFRA have been working in partnership with retailers to communicate information about the EU Energy Label, including updates, to consumers using materials such as leaflets, posters, staff training materials, internet banners and articles for in store and online magazines.
The Energy Star logo identifies products that the energy consumption of an appliance is below an agreed level in ‘stand-by’ mode. The well-known label appears on products such as computers, monitors, printers and fax machines, and can be applied on packaging, product manuals and software. The main aim of the label is to encourage the purchase of energy-efficient products, in addition to reducing energy-related carbon emissions and cost savings. Within the EU the Energy Star is a voluntary labelling scheme and its use is controlled by an agreement between the USA and European Community.

1.4 Boundaries of study

In this study, some of the terms that are used have ambiguous meanings or bring several similar terms or their definitions together. This section outlines the definitions to be used in this thesis and highlights the contexts and parameters of the elements in the study.

This research is primarily focused on in-house industrial designers working in UK SMEs (companies designing and manufacturing products as opposed to consultancies or freelance designers). This addresses a gap in the literature on environmental labels with regard to designers’ implementation of labels on their products and their propensity to use labels. The following sections will outline the rationales for this focus. In defining industrial design, the design process and ecodesign, the specific concerns or interests relating to in-house designers in UK SMEs will be raised.

1.4.1 Environmental Labels in the UK

This project is concerned with labels, symbols and schemes, both voluntary and compulsory, that present information connected to environmental or social issues and are in operation in the UK.
ISO 14020 (Type I and II), Type I-like, recycling symbols, compulsory labels and social labels are studied in this project. All of the labels, symbols, and schemes mentioned in this project are grouped together under the umbrella term environmental labels. Even though some of these do not technically qualify as an ‘environmental label’ under the UNOPS (2009) definitions, a single umbrella term enables consistency throughout the remainder of this project. Type III labels are not considered in this study as there are no such schemes active within the UK to date. The classifications of environmental labelling schemes by Rubik and Frankl (2005) presented in Figure 1.1 are used as the basis for this study. These are built on with further sub-categories by the author to expand on the ‘voluntary – other’ section in order to differentiate between social and ecological labels, and recycling label schemes as can be seen in Figure 1.21, and other e.g. test reports, norms, etc. The labels that this research project is to focus on are listed in Table 1.3.

![Figure 1.21 Environmental labelling classifications (adapted from Rubik and Frankl, 2005, p.34)](image-url)
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<thead>
<tr>
<th>Label Name</th>
<th>Label Image</th>
<th>Label Type</th>
<th>Where used</th>
</tr>
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<td>EU (inc. UK)</td>
</tr>
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<td>Type I-like (Voluntary)</td>
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<tr>
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<tr>
<td>Non-label specific self-declaration example</td>
<td>Type II (Voluntary)</td>
<td>Worldwide</td>
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<td>Other - Social (Voluntary)</td>
<td>Worldwide</td>
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<td>Soil Association Organic</td>
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<td>Green Dot</td>
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<td>EU (excl. UK)</td>
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<td>Worldwide</td>
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Table 1.3 Table of environmental labels that study focuses on
1.4.2 Ecodesign

‘Good design, sustainable design, commercially successful design, requires smart thinkers, enthusiastic individuals, committed teams and progressive executives (i.e. innovative eco-product developers).’ (Lewis and Gertsakis, 2001, p.15)

Papanek (1995) explained that most design decisions have either ethical implications or moral connotations. He claims this to be especially true of product [industrial] designers who should have the future firmly in their mind when developing solutions. The notion of ecodesign arises from recognition of the impact that products and industry have on the environment. The process aims to integrate environmental aspects into the existing brief setting stage wherever meaningful and possible (Tischner and Dietz, 2000) and these should be of equal importance to other considerations such as ergonomics, styling and manufacturing (Bhamra and Lofthouse, 2007). Environmentally sensitive/responsible design thinking has developed and evolved through time through three distinctive philosophical phases. These phases are green design, ecodesign and sustainable design (Tischner et al., 2000; Bhamra and Lofthouse, 2007). Under the concept of green design, the designer’s sole aim is to minimise any negative impact on the environment. The designer often chooses to focus on single issues such as the inclusion of recycled or recyclable materials, or reducing energy consumption (Bhamra and Lofthouse, 2007). This approach enjoyed initial success in the new green markets that had first appeared in the late 1960s and 1970s, and expanded through the 1980s and early 1990s thanks to the ‘green consumer revolution’ (Bhamra and Lofthouse, 2007). Tischner et al. (2000) stated that simply improving the ecological aspects of a product is of no benefit to the environment unless it performs adequately in terms of quality, cost-benefit ratio and satisfies the needs of the consumer.

Ecodesign can be expressed simply as the inseparable connection between economy and ecology through design practice (Tischner et al., 2000). Ecodesign involves maximising the efficiency of a product or system with
regards energy and use of resources and at the same time considering all the environmental impacts of a product throughout its life cycle (Bhamra and Lofthouse, 2007; McDermott, 2007). Because the whole life cycle of a product is considered, ecodesign has been described as ‘greener’ than green design (McDermott, 2007).

Sustainable design is the practice of designing by following sustainable principles and is an important driver in the concept of sustainable development. The definition that is widely accepted for sustainable development is that found in the 1987 United Nations (UN) publication *Our Common Future*, often referred to as the Brundtland report:

‘...development that meets the needs of the present without compromising the ability of future generations to meet their own needs’ (World Commission on Environment and Development, 1987).

Sustainable design can be seen as design which considers environmental, social and ethical issues (Bhamra and Lofthouse, 2007). Ecodesign and sustainable design consider issues throughout the product life cycle which product design or industrial design does not always follow. After the consumption stage, there is the end-of-life, which can include refurbishment, recycling, or energy recovery. McDermott (2007) argued that sustainable design to be the “greenest” of all design. Indeed, sustainable design has been noted as an attribute of simply ‘good’ design (Richardson et al., 2005). However, sustainability itself is considered by many to be more of a direction than a destination that can actually be reached (see Bhamra and Lofthouse, 2007).

There have been a number of other terms and phrases that have been used and discussed in the literature, such as Design for Environment, environmentally sensitive design, sustainably responsible design (e.g. O’Connor and Cox, 2005), good design (e.g. by Dieter Rams, cited by Vitsoe, 2013), clean design and environmentally conscious design (Argument, Lettice and Bhamra, 1997). To refer to the common elements of these phases and different terms, this thesis will use “ecodesign” as an umbrella term, as it is established and
widely recognised. The majority of the environmental labels which will be seen or discussed in this thesis are most closely related to ecodesign. Although some of the sources that are cited concerning ecodesign consider it to carry a different meaning from that outlined above, or use other terms, unless it will cause confusion it is taken that their terms fit under the term ecodesign.

1.4.3 Industrial Designers

This study focuses on industrial designers working in-house in UK SMEs. Each of these boundaries of study will be explained here. Industrial design[er] is used as an umbrella term to encapsulate product as well as industrial design[er]. The role of the industrial designer is to adapt new products of industry to the mass market (Heskett, 2001; McDermott, 2007). Using their knowledge and skills, industrial designers provide creative solutions to an initial brief, to provide a final product proposal. Industrial design has to satisfy subjective criteria such as personal taste and style as well as fulfilling the functional and ergonomic requirements of the product brief. Within the context of SMEs under investigation in this thesis, an industrial designer may be considered responsible for implementing ecodesign and educating colleagues about ecodesign and consequently may also have a role to play in environmental labelling. Additionally, designers are increasingly expected to perform the role of marketing (Design Council, 2007) or market researcher (NESTA, 2008; cited by the Design Council, 2008), as clients ask for information on future developments. Each designer is unique through their mixture of education, training, experiences, personal opinions and ethical values. It is commonly accepted that a designer needs to receive formal instruction and periods of academic study in design, although this idea is relatively recent following the demise of apprenticeships and the rise of university education (Lawson, 2006). The increasing experience that designers gain over time from working on design projects supplements their knowledge. Their initial ideas for solutions are usually drawn from this knowledge and previous experience and are applied to the design brief (Lofthouse, 2004).
1.4.4 In-house designers

In 2010 there were estimated to be 83,600 in-house designers in the UK, with 63% of these designers working in teams of between one and four (Design Council, 2010), demonstrating that a majority of designers work alone or in small teams. Designers have been recognised as working both individually and collaboratively (Oehlberg et al., 2011). Almost 60% of these designers feel equipped to advise their clients on sustainable design, however, only 18% of designers consider it as an important factor in winning business (Design Council, 2010).

1.4.5 SMEs

“SME” stands for small and medium-sized enterprises. EU law determines that a company is an SME based on the number of employees being <250 and either their turnover is <50 million Euros or their balance sheet totals <43 million Euros. In 2013, there were 4.9 million SMEs in the UK (Rhodes, 2014). As O’Connor and Cox state: ‘small and medium-sized enterprises (SMEs) represent a key element of national economies throughout the world, and they play a significant role in the design, development and manufacture of new products’ (2005, p.72). SMEs form a major element of industrial and product design and manufacturing domains and are a vital element if sustainable development is to succeed (Hillary, 2004). Esty and Winston (2006) state that SMEs are well placed to adopt ecodesign because they are nimble, able to change, and some have niche markets. However, the smaller the company, the fewer benefits they perceive from engaging with environmental issues (Brammer et al., 2012).

Another reason why SMEs are the focus of this research is because in-house designers within manufacturing SMEs (not consultancies) are typically involved in more phases of the design process (i.e. involved from design brief through to manufacture), have a greater influence on those phases, and they are often expected to carry out other associated roles (such as marketing) (Annable and
Burns, 2009; Design Council; 2007; McDermott, 2007). Their interaction with other professionals is also specific; designers are encouraged to work in teams rather than alone, yet consultancies are more likely than in-house designers to bring in external expertise. In large companies, marketing, brand development, engineering, strategic functions as well as dedicated research and development (R&D) departments often play a larger role than designers (Richardson et al., 2005), suggesting that in SMEs, designers may be expected to share more responsibilities and therefore may have a larger role to play and which warrants further investigation.

1.4.6 United Kingdom

Despite there being many international and European labelling schemes the actual range of applicable labels and their associated governance is unique to each country. To avoid the complications of considering a variety of national differences, this study has been constrained to the UK. Therefore, UK SMEs are the focus of this study. The UK is not a front runner in terms of ecodesign, use of environmental labels, and green market share compared to countries such as Germany, the Netherlands, and the Nordic countries (BIS, 2012, 2013; EC, 2013a; Tukker et al., 2001), yet the UK is in the top few countries within the EU when it comes to some environmental aspects of SME activities such as efficient resource use or recycling of company waste (EC, 2013b). Additionally, the UK has the highest percentage of SMEs most likely to be planning additional actions to minimise waste (EC, 2013b). The United Kingdom is traditionally an EU frontrunner in terms of its business environment and put many measures in place to improve the environment for SMEs long before other Member States (EC, 2013a). Indeed the Department of the Environment (DoE) was set up in 1970, ‘the first environmental ministry in the world’ (Jordan, 2002 cited in Wurzel, 2013, p.62). The EC notes that the United Kingdom boasts a very competitive environment for SMEs compared to other EU Member States and in many SBA [Small Business Act for Europe] policy areas such as the environment and public procurement the United Kingdom scores well above the EU average (EC, 2013a).
The latest available figures show that in 2011 to 2012 low carbon and environmental goods and services had increased to be worth £128 billion and employed around 938,000 in the UK according to the Department for Business Innovation & Skills (BIS, 2013). The UK green goods and services market has continued to grow in recent years despite the global downturn which began around 2008 (BIS, 2012). The UK is not leading the way in the world, or even Europe, when it comes to the promotion and use of environmental labels. However, neither is the UK disinterested or apathetic towards the ends that environmental labels are attempting to achieve. The UK does not have its own stand-alone Type I label but does subscribe to the EU Ecolabel, with most recent statistics from 2012 reveal a total of 1,616 products had been issued with the EU Ecolabel in the UK (EC, 2014). However, there are other labels in use within the UK which have enjoyed successes in consumer recognition, understanding, and market penetration such as the FSC label, with more than 10,000 product lines in the UK currently carrying it, many sold in major retail stores (FSC, 2014). Nevertheless, UK companies have been found slow to respond to trends in sustainability policy (Richardson et al., 2005).

The main competition for 92% of UK design companies is reported to come from within the UK, and for many is local (Design Council, 2010). Only one in five design for export, compared to a European average of one in four (Design Council, 2010). Although it is appreciated that there is a global marketplace and often products are sent for export, companies that largely produce for the domestic marketplace will be used in this study.

1.4.7 The Product Development Process (PDP)

The Product Development Process (PDP) has also been referred to in literature as the Industrial Design Process. The PDP has been visualised as a linear process since the 1960s and this is widely accepted. There have been numerous models since Archer (1965) illustrating what goes on during the PDP, both overall and at the various stages/phases. Dubberly (2005) collected over 100 models of PDPs.
This study will assume a linear process, with start and end points. It is important to select a PDP model because this shows the stages of the design process and will allow the influence of labels on designers at various stages to be understood. The Design Council’s (2005) double diamond diagram is used here as a basis (Figure 1.22). This model is four-phase: discover, define, develop and deliver. Discover includes market research of initial idea or inspiration identifying user needs; define is to interpret needs and align them with business objectives; develop includes creating design-led solutions including concept development and testing; finally deliver means to manufacture and launch of product into the relevant market. The design brief is formulated between the define and develop phases.

![Double diamond design process](image)

**Figure 1.22 Double diamond design process (Design Council, 2005)**

The design brief is a crucial stage for setting parameters (Luttropp and Lagerstedt, 2006; Bhamra and Lofthouse, 2007) – which includes research about consumer needs, manufacturing specification, sales planning and profit potential (Powell, n.d. cited in McDermott, 2007). This stage is usually led by senior management and is typically influenced by the company’s strategic plan
(Annable and Burns, 2009). This engagement of other professionals in multifunction teams in the design process must be remembered, as it affects the decision making of industrial designers and the outcome of their work (Luttropp and Lagerstedt, 2006; Richardson et al., 2005). That said, ‘product design in the UK is typically carried out by one or more individuals who are familiar with an organised design process’ (Deutz et al., 2013, p.123; emphasis added). However, the PDP in SMEs is argued not to be linear, but circular, flexible and having a ‘fuzzy front end’ – research feeds ideas, development and selection; customer needs or market opportunities are determined and concepts developed and evaluated (Annable and Burns, 2009; Cox, 2005; Hohenegger et al., 2008).

1.5 Research Aims, Objectives and Questions

1.5.1 Research Aim

The overall aim of the study is to investigate factors affecting the implementation of environmental labels by in-house industrial designers in UK SMEs.

1.5.2 Research Objectives

On the basis of the above aim, four objectives will be met:

1. To review existing types of environmental labels available in the UK

2. To survey what in-house industrial designers currently know about environmental labels by establishing contact with a sample of those within UK SMEs

3. To investigate where environmental labels currently fit into the work of in-house industrial designers in UK SMEs
4. To understand the factors that affect the implementation of environmental labels in UK SMEs by in-house industrial designers

1.5.3 Research Questions

Robson lists the five criteria to ensure good research questions (based on Punch, 1998) as clear, specific, answerable, interconnected, and substantively relevant (Robson, 2002). The six research questions this study answers are:

1. What impact have environmental labelling schemes had within the UK?

2. What do in-house industrial designers in SMEs understand about environmental labels and schemes?

3. Where do environmental labels fit into the work of in-house industrial designers in UK SMEs?

4. How do environmental labels and schemes currently affect in-house industrial designers?

5. What information do in-house industrial designers claim to need and want to know about environmental labels and schemes?

6. What are the factors affecting in-house industrial designers’ implementation of environmental labels in their work?

1.6 Thesis structure

This thesis consists of a further eight chapters. Chapter 2 offers a review of literature on ecodesign as it relates to designers’ work. The chapter goes on to offer a critical review of the impact of labels to date on the environment,
consumer recognition and propensity to buy, market share and companies. Finally, the chapter turns to examining the literature on designers and environmental labels, including the knowledge and responsibilities of designers. It concludes that there are gaps in the literature concerning the role of designers in the labelling process, what designers know about environmental labels and factors affecting how designers implement labels. This is followed by Chapter 3, the Methodology, wherein the selection of methods of data collection and analysis is outlined and justified. The empirical aspects of this study begin with Chapter 4 which reports the Preliminary Study. This attempted to construct a picture of designers' awareness and understanding of various environmental labels, and establish their current involvement or interaction with labels through their professional work. The Preliminary Study highlighted that designers stated that they would benefit from knowing about various environmental labels and schemes relevant to their work. Also indicated was how they would want this information to be delivered. Following analysis of the Preliminary Study, a Resource was created, outlined in chapter 5, called the ‘Designers’ Environmental Labelling Resource’ (henceforth called ‘DELR’), which was developed to act as an elicitation tool in the Main Study. Subsequently, chapter 6 presents the Main Study data. Following analysis, case studies were developed with three UK SMEs who use labels. Data from the Case Studies is presented in Chapter 7. Chapter 8 offers a discussion of key issues raised by the empirical data gathered through the Preliminary Study, Main Study and Case Studies, in light of the existing literature. The project culminates with Chapter 9 with conclusions from the research study; implications for designers, labelling schemes and industry; and suggestions for further work.
2 LITERATURE REVIEW

The Introduction established that this thesis is investigating environmental labels with a focus on UK SMEs with in-house designers. This chapter reviews the literature that shapes this research project. It will establish that environmental labels are valuable today and will continue to be so in the future. Much research on labels has been carried out on their impact on consumers, the environment or the market; less is known about labels’ impact on companies, and specifically their designers. This chapter will demonstrate that designers are considered responsible for many of the environmental impacts that a product has. It will also appraise literature concerning how labels are applied and their impact and shortcomings to date. It covers subjects concerning the relation of environmental labels to designers, industry, consumers and the market in the UK. Before exploring this literature, it is necessary to establish the place of SME in-house designers in ecodesign. The chapter concludes by indicating the information about environmental labels that is available for designers, and establishes the direction of the research reported in this thesis: the factors affecting the implementation of environmental labels by designers.

The sections are structured thus: 2.1 reviews the drivers, barriers, and successful integration factors for ecodesign in SMEs. 2.2 explores literature on ecodesign and industrial designers, in order to establish the roles of designers in ecodesign. 2.3 presents an appraisal of the impacts and shortcomings of labels as researched to date. 2.4 more closely examines research into designers’ relationship to labels and the knowledge that they have concerning implementation of labels. The chapter concludes with 2.5 posing the rationale for the study by highlighting the gaps in current knowledge.

2.1 Ecodesign and SMEs
Environmental labels are a method used by companies to inform consumers of their activities concerning the environment. These activities fall within the sphere of ecodesign. This section considers the factors affecting implementation of ecodesign in SMEs. In order for ecodesign strategies to be implemented, there must be advantages for companies in doing so. Business has been long seen as having a key role to play in further defining and implementing the environmental agenda (Elkington et al., 1991). It is imperative for the environment that industrial design practitioners implement ecodesign strategies, according to Tischner et al. (2000, p.9):

‘Every business places a burden on the environment, because there is no such thing as “environmentally friendly goods”, but only more or less environmentally impactful goods (products, infrastructures and services)’.

Although no precise figure can be placed on or agreed for the advantages to implementing an ecodesign strategy, it is accepted that the benefits are substantial both for the economy and ecology of products (Bruce and Laroiya, 2006). It is for these benefits that many motivated companies have incorporated ecodesign methods such as “continual improvement processes” and LCA into their operational activities. In many cases this has proved decisive in the overall environmental performance of a product and it is clear that product design can greatly influence these processes (Wimmer and Züst, 2001).

2.1.1 Legislative drivers

In some instances, legislation has been enacted to, in part, reduce the negative impact of industrial activities on the environment. The European Union has introduced considerable legislation over recent decades that relates both directly and indirectly to negative environmental impacts from consumer products. The United Kingdom has created many of its own regulations based on these Directives to aid implementation. Pertinent examples include Waste Electronic and Electrical Equipment (WEEE) (2012/19/EU), Restriction of Hazardous Substances (RoHS) (2002/95/EC) and Eco-design for Energy-using
Products (EuP) Directive (2005/32/EC). In 2009 the EU adopted the directive 2009/125/EC on ecodesign. Mackenzie (1991) predicted that this type of regulation would control industrial and individual behaviour. The impact on industry and designers is that they are required to follow the applicable legislations and ensure their products meet the criteria set by both EU and UK. Alongside this, international agreements such as Kyoto (1997), which led to targets for carbon reduction being set by each ratifying country, and the Rio+20 conference, are also a consistent part of the discourse concerning sustainability with which designers come into contact.

Many pieces of legislation are directly or indirectly linked together. This strengthens and improves how effectively these Directives and Regulations can be applied. For example, the Restriction of the Use of Certain Hazardous Substances (RoHS) in Electrical and Electronic Equipment (EEE) Directive (2011/65/EU) seeks to reduce substances such as lead and mercury in new EEE. This should help designers to make products easier and safer to treat and recycle when they become waste and are subject to the WEEE Directive. However, it has been argued that increasing levels of legislation could restrict product innovation as manufacturers ensure they meet all the requirements:

‘Unnecessary environmental constraints prevent the optimal use of resources and may thus make uneconomic projects which would otherwise be worthwhile’ (Department of the Environment, 1977 p.2).

It is for this reason that the EuP Directive was hailed as such a breakthrough in policy, as it did not set firm targets to meet and allows for flexibility in design. The characteristics of the Directive could be modified or replaced by more suitable features by industry. Replacing the EuP, the Energy-related Products Directive (ErP), was introduced in 2009 (Directive 2009/125/EU). It sets out compulsory environmental requirements for energy-using and energy-related products. Products that comply with the ErP Directive display the CE Mark because they satisfy product safety and energy efficiency requirements. Case studies by Gottberg et al. (2006, p.38) into eight EU-based lighting firms (including two from the UK) found that ‘drivers, such as bans on hazardous
substances, product declarations and supply chain pressures, were often more effective promoters of eco-design. Thus it seems a mix of policy measures is required rather than reliance on economic instruments alone.

In addition to legislation, standards ensure desirable characteristics of products and services such as quality, environmental friendliness, safety, efficiency and reliability are met by all products under the remit in order to be approved for sale. Standards also provide government with a technical base for health, safety and environmental legislation (ISO, 2008). Giudice et al. (2006) described standards as being conceivably the most effective way of promoting ecodesign by encouraging a preventative approach to environmental issues. Standards that impact designers in the UK have been set predominantly by both the International Standardisation Organisation (ISO) and the British Standards Institution (BSI).

The alternative to legislation is to leave it to industry sectors and individual companies to introduce their own ethical codes of conduct and environmental policies. Papanek (1995) criticised these “professional codes of conduct” as protecting members of the sector from public scrutiny and criticism and furthering their fortunes. He went on to say that only once these ‘cover your own backside, boys!’ ethics are eliminated can design truly address ethical and social issues (Papanek, 1995, p.70). An example of why legislation has been required to control the activities of industry was misleading marketing of supposedly “green” products using unsubstantiated or false claims in order to encourage purchase. This is called greenwashing, as discussed in the Introduction. As well as legislative “push” factors, there are also “pull” factors in the form of economic motivations.

2.1.2 Economic motivations

There are economic motivations for companies to do ecodesign, especially SMEs. These include savings and efficiencies in manufacturing, as well as new or enhanced markets. The global Low Carbon and Environmental Goods and
Services (LCEGS) sector was worth £3.4 trillion in 2011/12 (BIS, 2013) up from £3.3 trillion in 2010/11 (BIS, 2012). In both 2010/11 and 2011/12 the UK secured a 3.7 per cent share of the global LCEGS market and also retained its place as the sixth largest in the world, behind the US, China, Japan, India and Germany (BIS, 2012, 2013). Globally, environmental goods and services were worth almost £704 billion in 2010/11, and increased to over £726 billion in 2012/13.

Reviewing surveys of small, medium and large businesses in the UK, USA and Australia, Smith et al. (1996) concluded that companies rarely set out to create a “greener” product, but one that would perform better, increase or maintain market share, satisfy market demands or regulations. Only later would they see the environmental benefits to their commercial aims. Smith et al. (1996) observed that products could not be sold purely on their greenness but also had to have other competitive aspects in term of specification, performance and quality; or value for money or reduced operating costs. This was despite noting that green products had high sales increases year on year. However, they had higher development costs and hence a longer payback period, which is a risk that may be as great as the opportunities created (Horne, 2009). Two decades on from Smith et al.’s research, legislative and market environments have developed. ‘Eco-friendly’ products are now considered a competitive advantage (Houe and Grabot, 2009):

‘SRD [sustainably responsible design] presents SMEs with an opportunity to create a competitive advantage, maximising benefits for their businesses, as well as for their stakeholders.’

(O’Connor and Cox, 2005, p.72)

Although, as Golden et al. remarked in 2010, ‘[a] product that cannot deliver consumers’ needs will fail in the marketplace, no matter how ecofriendly it is’ (p.11).

Case studies of manufacturing SMEs in Italy and Canada by Dangelico and Pujari (2010) identified a number of important drivers for green product development. These were: ‘the expectation of green market growth and
increased profits, the improvement of reputation and corporate image’ (p. 480), and sense of ecological responsibility, ‘deriving from the concerns that companies have for social obligations and values, and that often originates from an internal environmental orientation of the company or from the personal commitment of the top management’ (p.481).

Working with 15 SMEs in the UK who have interest in and knowledge of ecodesign, Brindley and Oxborrow (2013) argue that market opportunity is a catalyst for change towards sustainability, as opposed to compliance, cost or environmental benefit. Elsewhere, customers and legislation have been noted as the key drivers of ecodesign for SMEs in the UK (Hillary, 2004; Perez-Sanchez et al., 2003). However, more recently, Zackrisson et al’s (2008, p.1884-5) study with ten European SMEs (not including any UK-based) said that ‘it seems an explicit customer demand is not always necessary for implementing environmental improvements’. Allegedly, SMEs are able to react quickly to changing markets and meet emerging needs / demands as they are nimble and agile. This brings benefits as they are able to capitalise on the need for products for the green market, and ecodesign can help with this. Lefebvre et al. (2003, p.264) argue that SMEs may be more flexible and responsive than larger firms, and come under less external pressure because of their lower visibility: ‘green products often correspond to niche markets, where small firms thrive’. Although this was found in a Canadian context, it echoes research with UK, US and European companies that considers smaller companies to be more innovative (Simon et al., 2000). Ultimately, combinations of economic and competitive advantages or motivations tied with legislative inducements suggest a complex field for SMEs but one in which ecodesign has a place (Lefebvre et al., 2003). However, as the next section will explain, SMEs might not be as flexible or brave as some of the literature may suggest. With change comes risk and uncertainty, and SMEs can be sceptical about the benefits of ecodesign (e.g. Hillary, 2004) no matter how strongly anticipated by consumer demand or promised by government green procurement policy.
2.1.3 Barriers or risks of ecodesign for SMEs

Despite Boonkanit et al. (2007, p.13) saying that ‘many companies have realized the need to become more environmentally responsible’, UK SMEs have been noted as very sceptical of the benefits to be gained from making environmental improvements (Hillary, 2004). Boks (2006) highlighted that companies are increasingly calling for evidence of the potential benefits to their business of making products with reduced environmental impact because of the recognition that this often involves additional costs. Companies hence must be convinced of the market need and the benefit to themselves.

Consumers have been considered to have the influence ‘to stimulate manufacturers to innovate because manufacturers may hope that improved environmental performance communicated to consumers means increased market share’ (ISO, 2012, p.6). Although SMEs (including those in the UK) are considered to be more innovative (Simon et al., 2000), and more flexible and responsive (Lefebvre et al., 2003), elsewhere it has been argued that within UK SMEs it may be that little time is given to new product development and there is a reactive design process to respond to customers’ needs rather than create new ideas (Annable and Burns, 2009). While Sala and Castellani (2009, p. 1) point out that there is an important place for SMEs in ‘promoting and implementing eco-innovation’, and despite encouragement to do ecodesign or be eco-innovative because of a competitive advantage, there may be more difficulties for SMEs in doing so, as they may have greater concerns with everyday performance (according to Perez-Sanchez et al.’s 2003 study in the UK) or ‘negative company culture towards the environment’ (Hillary, 2004, p.568; carried out in nine EU companies including two UK). There may be no guarantee that the effort and investment required to make products better in environmental terms will result in commercial success or make practical business sense (Brindley and Oxborrow, 2013; Dangelico and Pujari, 2010; Hall and Clark, 2003; Houe and Grabot, 2009; Karlsson and Luttropp, 2006). Major challenges centre on ‘high development and manufacturing costs that make their price non-competitive’ or compromising product quality (Dangelico and
Challenges from developing and marketing green products include ‘increased public scrutiny by stakeholders, particularly the environmental groups’ which, they say, ‘[s]ome companies may not find […] comfortable’ (Dangelico and Pujari, 2010, p.481). An ecodesign strategy requires skills and resources (including human resources, Hillary, 2004) that many SMEs do not have, in addition to financial resources needed to begin, without any certain short term return (Bianchi and Noci, 1998). Argument et al. (1997) go so far as suggest that ecodesign could be considered a threat to the survival and profitability of a company. SMEs have been reported as struggling in the UK to access loan and credit financing (EC, 2013a). Companies need confidence to adopt sustainable values.

Annable and Burns (2009) note that SMEs need a particularly flexible PDP which features design and marketing combined. They draw from Hohenegger et al. (2008) to call for support for the front end in SME design work if innovation (including ecodesign) is to be successful. De Eyto et al (2008) point out that the complexities of doing ecodesign offer barriers to designers and markets alike. Implementation can be slow, and SMEs are often unable to dedicate resources to sustainable design, at least in the Irish context in which de Eyto et al. (2008) researched. The next section explores what aids successful integration of ecodesign.

2.1.4 Successful integration of ecodesign

Johansson (2002) identified six areas of concern into which factors for successful integration of ecodesign in product development could be grouped: management; customer relationships; supplier relationships; development process; competence; and motivation (see Table 2.1 below). Many of the factors are, argues Johansson (2002), important elements of good design regardless of whether or not it is ecodesign, suggesting that ‘a company that manages product development well increases the likelihood of being successful when integrating ecodesign in product development’ (Johansson, 2002, p.106).
<table>
<thead>
<tr>
<th>Area of concern</th>
<th>Success factors</th>
</tr>
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| Management      | Commitment and support are provided  
                              Clear environmental goals are established  
                              The environmental considerations are addressed as business issues  
                              Not only the operational dimension of ecodesign should be considered, but also the strategic dimension  
                              Environmental issues are included when establishing a company's technology strategy |
| Customer relationships | A strong customer focus is adapted  
                              Companies train their customers in environmental issues |
| Supplier relationships | Close supplier relationships are established |
| Development process | Environmental issues are considered at the very beginning of the product development process  
                              Environmental issues are integrated into the conventional product development process  
                              Environmental checkpoints, reviews and milestone questions are introduced into the product development process  
                              Company-specific environmental design principles, rules and standards are used  
                              Ecodesign is performed in cross-functional teams  
                              Ecodesign support tools are used |
| Competence      | Education and training are provided to the product development personnel  
                              An environmental specialist supports the development activities  
                              Examples of good design solutions are utilized |
| Motivation       | A new mindset emphasising the importance of the environmental considerations is established  
                              An environmental champion exists  
                              Individuals are encouraged to take an active part in the integration of ecodesign |

Table 2.1 Success factors for integration of ecodesign in product development (taken from Johansson, 2002, p.105)
Of note is that success is greater when ‘environmental issues are considered at the very beginning of the product development process’ (Johansson, 2002, p.106). In order for ecodesign to be successful, it needs to be integrated into early stages of product development such as the design brief stage, as recognised by Bhamra (2004). Elsewhere this argument has been expanded, with Deutz et al. (2010, cited in Deutz et al., 2013, p.118) stating ‘sustainability needs to be recognised as a functional requirement before concept generation otherwise there is a danger of its being merely a design criterion (a consideration in selecting the preferred solution) rather than a fundamental proposition inherent in the generation of potential design solutions’. In other words, successful ecodesign requires a commitment that is both early and fundamental in order to truly have an environmental impact. Other factors identified by Johansson (2002) are specifically clustered under competence and motivation: education, specialist(s), mindset and individuals taking an active role. Section 2.3 addresses these two concerns for success (and lack of success): competence and motivation, specifically relating to SME in-house designers.

### 2.2 Industrial designers and ecodesign

Significantly Johansson’s (2002) competence and motivation factors stress individuals’ roles, in comparison to the other features in the table that stress company structure or processes. A common feature of companies successfully implementing ecodesign may be an “environmental champion” (Post and Altman, 1994). Simon et al. (2000, p.371) noted that environmental champions ‘within product divisions or design teams […] act as a source of expertise and a channel of communication upwards or outwards when knowledge is lacking’. Environmental champions may have a training or awareness-raising role also (Ehrenfeld and Lenox, 1997; Lenox and Ehrenfeld, 1997; Simon et al. 2000). Simon et al. (2000) note that environmental champions are often drawn from design teams, and this may be especially so within SMEs where there is no colleague who solely takes this role. As Deutz et al. (2013) highlight, SMEs are less likely to have access to in-house support or paid-for services concerning
education and information on ecodesign. Richardson et al. (2005, p.7) call these champions “pioneers” ‘driven by a personal commitment to the sustainability agenda.’ This concurs with literature on or aimed at designers that encourages them to drive shifts towards sustainable thinking (e.g. Bhamra and Lofthouse, 2007; Lewis and Gertsakis, 2001).

2.2.1 Designers’ responsibilities regarding ecodesign

It has long been accepted that designers have an unparalleled opportunity to influence the impact their products have on society (Fabrycky, 1987). Indeed, designers ‘are said to have the key to sustainable product development through EcoDesign’ (Luttropp and Lagerstedt, 2006 p.1396). Papanek, on the responsibilities of designers, said in his 1972 book *Design for the Real World*, ‘design has become the most powerful tool with which man [sic] shapes his [sic] tools and environments. This […] demands greater understanding of the people by those who practice design and more insight into the design process by the public’ (Papanek, 1972, pp.ix-i). Mackenzie (1991) reinforced this argument, stating that if these new concepts and criteria of ecodesign are not incorporated into the work of designers, their role and value would be substantially reduced. However, it was recognised that up until the early 1990s:

‘Many designers assume that their area of responsibility is limited to function and appearance. Designing with environmental impact in mind was a matter of personal taste or individual moral responsibility’ (Mackenzie, 1991, p.8)

Press and Cooper (2003) mention the notion of designers being “responsible citizens” and design as “social entrepreneurship”. An analytical approach towards design projects, not just from an environmental perspective, is not new. In the 1970s Papanek attempted to encourage designers to design for people’s needs rather than wants (Papanek, 1972), and more recently Bhamra and Lofthouse (2007) suggested that:
‘Asking whether a product is actually needed should be a core concern of the responsible designer.’ (Bhamra & Lofthouse 2007, p.56)

There is evidence that designers can improve the environmental impact of their products through various ecodesign strategies (Bhamra and Lofthouse 2007). Some academics argue that the design decisions made by the designer make an immense impact on many vital sustainable aspects of the product including its environmental performance at each stage of the process (Fabrycky, 1987; Mackenzie, 1991; Tringham, 2007). Industrial designers have a very similar role to play in ecodesign as they would in any design process (Lofthouse, 2004). Lewis and Gertsakis (2001, p.16) point out that many ‘common sense design decisions […] already […] equate to [ecodesign]’. “Doing ecodesign”, then, should not be a different process or unfamiliar concept to designers. However, there appear to be a number of factors affecting whether SME in-house designers are able to carry out this responsibility successfully. As designers can work both individually and collaboratively (Oehlburg et al., 2011), their position within the product design process and within their company (hierarchical relationships with colleagues, for instance) has a major influence on their capability to successfully implement ecodesign.

### 2.2.2 Ecodesign and designers in the PDP

The input of designers into the products they design largely depends on the brief that is set. The design brief can restrict, even prohibit, the ability of designers to employ ecodesign strategies. The idea that the costs that accrue during the life cycle of a product are largely predefined by its development was first studied systematically by Oppitz (1970, cited in Wimmer and Züst, 2001). The product related costs and environmental impacts that are thought to be predefined in the product development process are considered to be over 80% (Directive 2009/125/EU). When ecodesign is stipulated at that stage there may be most success: the early stages may be the most crucial for ‘more radical environmental improvements and innovations’ (Bhamra 2004, p.567). Designers’ involvement in the early stages of the PDP has been seen to be a
valuable influence on the capability of doing ecodesign (Lofthouse, 2004). Lefebvre et al.'s (2003, p.278) study revealed that in companies orientated towards ecodesign, ‘environmental R&D activities occupy a privileged locus, upstream in the product life cycle, and consequently have the highest potential to yield radical innovations to improve products’ and manufacturing processes’ environmental performance.’ The design profession can do this by changing its emphasis and by giving the environment a key place within product parameters’ (Borsboom 1991, cited in Boks 2006). This implies that designers have influence over or input into the design brief and/or specification (if this is what is meant by product parameters).

However, it has previously been noted that issues associated with environmentally and socially sensitive design are rarely addressed in the design brief (Bras, 1997). More recently, this has been argued to restrict or prevent designers from having the opportunity to employ responsible design principles (Bhamra and Lofthouse, 2007). If it is included, sustainability can seen as one of many factors on a design brief and as such it may not be given priority (Richardson et al., 2005). Consequently, ecodesign must, argue Argument et al. (1997), become intrinsic, not an afterthought. Designers who have an input into the design brief have the responsibility of highlighting potential environmental concerns and encouraging opportunities to facilitate ecodesign throughout the design process (Bhamra and Lofthouse, 2007). It appears to remain designers’ responsibility to consider the impacts that their decisions are likely to have by drawing on knowledge and experience and making judgements on them. Designers who are not involved in the creation of the design brief are encouraged to look critically at its contents with a view towards the environmental impacts that could be associated with possible solutions (Bhamra and Lofthouse, 2007). Even designers working with the tightest of closed design briefs will still have some design decisions to make (Lawson, 2006).

The PDP in SMEs is argued not to be linear, but circular and flexible – research feeds ideas, development and selection; customer needs or market opportunities are determined and concepts developed and evaluated (Hohenegger et al, 2008; Annable and Burns, 2009). Koen et al. (2004 cited in
Annable and Burns, 2009) state that formal PDPs are too complex for SMEs, who rather take simpler and more flexible PDPs that combine design and marketing processes, especially in the early stages or front end. Little time is given, in SMEs, to new product development, and the process is often reactive to customers’ requests. This has also been noted by Richardson et al. (2005) and is supported by the Cox Review of Creativity in Business (Treasury, H.M., 2005) which states that many UK SMEs do not know how to access good design, limiting their potential for innovation and growth. Annable and Burns (2009) argue that within SMEs, the ‘chaotic’ nature of the ‘fuzzy front end’ of the design process requires attention, and illustrate how non-linear, iterative processes at the front end affect the PDP and designers’ role, specifically in SMEs. In this adapted model, research feeds ideas, development and selection, customer needs are determined and concepts are developed and evaluated, before product development proceeds.

In SMEs designers may have multiple roles. Designers are encouraged to be willing to undertake new roles, committing to developing a necessary broad range of skills (Perks et al., 2005). One recent development has been the involvement of designers in the marketing strategy through combining design and advertising in the same process, “convergent design”, to ensure that both parties focus on and are able to communicate the key aspects of the product such as its quality, function and significant features (McDermott, 2007). The role of the designer ‘grew and stretched, crossing boundaries of social science, marketing and branding’ (Design Council, 2007, p.7). Additionally, designers are increasingly expected to perform the role of market researcher, according to NESTA (2008; cited by the Design Council, 2008), informing on future developments. In particular, Hillary (2004) points out that staff members tasked with implementing ecodesign processes are more likely to be interrupted and efforts diverted if they are required to fulfil multifunctional roles, which is more common in SMEs.

Designers’ lead-taking has been problematised. In the past some enthusiastic individual designers have been reported as prevented by ‘corporate procedures’ from improving the environmental performance of the products they were
designing (Simon, 1997, p.13). Having interviewed designers across mainstream and sustainable product design, Richardson et al. (2005) argue that many designers are passive and reactive rather than proactive, not taking a lead because they may lack the entrepreneurial skills to identify opportunities and prefer to wait for consumers to demand more sustainable products. Their designer-participants wanted governments to motivate businesses and show them the way. Additionally, designers may feel that they are constrained in their power to impact change, especially if they feel that they are too low down the product development process to do anything but respond to a predetermined brief (Richardson et al., 2005). Designers who access the ‘process too late [may] contribute little more than styling and ‘add-on’ functionality’ (Richardson et al., 2005, p.8). Lindahl (2006) identified a lack of commitment from the designer as a cause of ecodesign failure. It could be that older or more experienced designers are resistant to change, preferring to stick to traditional activity and skills base (de Eyto, 2008; Perks et al, 2005). Being an environmental champion might be seen as a personal preference, a choice to highlight sustainable and ethical issues over other aspects of design (Richardson et al., 2005). For success in ecodesign, its inclusion in the design brief alone is not sufficient, but given the position of successful ecodesign within the design brief, ecodesign also falls under the remit of other professionals involved throughout the PDP.

2.2.3 Designers and their colleagues

Ecodesign requires significant multi-stakeholder involvement (O’Connor and Cox, 2005). Lewis and Gertsakis (2001) claimed that globally, all professionals involved in the designing of new products are key in the development of more environmentally preferable products. Other professionals with responsibility include marketing practitioners, materials selectors manufacturing within a company, external parties such as industry representatives, and government policy makers (Richardson et al., 2005; Tischner et al., 2000). There is debate over who engages with designers concerning the implementation of ecodesign; although the design brief is usually led by senior management and is typically
influenced by the company’s strategic plan (Annable and Burns, 2009), Boks (2006) says that getting environmental issues to the designer was seen as a task for middle management rather than corporate management. However, designers remain a central part of this process. With support from colleagues, it seems designers have a better chance to produce innovative ecodesigned solutions to real problems.

Designers’ place alongside other practitioners who have roles throughout the design process is part of the reason why the roles and responsibilities of designers in ecodesign are difficult to define, because design decisions are not solely down to the designer to make. Bhamra and Lofthouse (2007) argue that an important role designers should perform is to inform their colleagues that design for sustainability is better than just recycling or using recycled materials. This builds on what Papanek (1984) argued, that designers must translate and communicate with others involved in the PDP whilst performing their design task, which should include following ecodesign principles. Evidently, environmental demands are not the only priority and are balanced against other needs (Giudice et al., 2006; Luttropp and Lagerstedt, 2006; Richardson et al., 2005). The processes of ecodesign may not be immediately obvious, leading to a potential for the benefits to go unnoticed (Wimmer and Züst (2001); designers have a lack of understanding of sustainability unless told about it by managers (Richardson et al., 2005); designers may only attain incremental and small influence over colleagues (de Eyto et al., 2008). While a need for managerial expertise has also been highlighted (Lefebvre et al., 2003), designers may be considered the source of information, skills, and theoretical and practical knowledge needed to implement ecodesign as it is perceived to often be included in formal design education (Richardson et al., 2005). After all, designers have been identified as potential or even likely environmental champions (e.g. Lewis and Gertsakis, 2001).

### 2.2.4 Industrial designers’ knowledge about ecodesign
‘Design – as a very process of change itself – must be informed by changing knowledge. Indeed, design is an expression and embodiment of knowledge’ (Press and Cooper, 2003, p.7).

A number of points made in the literature on designers and ecodesign suggest that it is considered designers’ responsibility to gain and sustain knowledge of ecodesign processes (de Eyto et al., 2008; Lewis and Gertsakis, 2001; Papanek, 1984; Richardson et al., 2005). Designers are seen as the most likely to be aware of environmental issues and educated on how to address them. Yet Lofthouse (2004) recognised that some industrial designers do not know how to translate ecodesign concepts through the development process into a final product solution and are potentially also unaware of government policy (Richardson et al., 2005). In SMEs it may be that there is little support for designers with low knowledge (Annable and Burns, 2013). Likewise, Hillary (2004) notes that SMEs face the problem of locating good quality advice and information. SMEs are more likely to rely on free sources of information than subscriptions to industry information or in-house support (Deutz et al., 2013). Lack of information may be a crucial issue in the failure of ecodesign (Lindahl, 2006). Designers not specifically creating sustainable products have been identified as ‘especially challenged to acquire the necessary skills and knowledge required to design sustainably, with many saying they are at a loss to know where to begin’ (Richardson et al., 2005, p.31).

De Eyto et al. (2008) (researching in the South East of Ireland) found that students and graduates at least recognised the importance of doing sustainable design and felt that it was of high importance to them as individuals and for their future employers, while designers in SMEs understood environmental and social issues but had a lesser appreciation or acknowledgment of how they related to their design work. Students in that study reported an understanding of the value of ecodesign. Designers practising in SMEs had similar knowledge to the students but demonstrated limited appreciation for the connection of this ecodesign knowledge to their current work (de Eyto et al, 2008). There may be a mismatch between design students’ learning and desire to do ecodesign and
the realities of practicing designers. Thus advice, skills and knowledge need to be focused specifically on practicing designers’ needs (de Eyto et al., 2008; Perez-Sanchez et al., 2003).

One of the key challenges for designers has been to find practical tools which can be incorporated into their design process to help them practice design for sustainability, according to Lofthouse (2004). The requirements of industrial designers for ecodesign are considered almost the same as those they have during their regular design process (Lofthouse, 2004). Bhamra and Lofthouse (2007) categorised tools and methods currently available to assist designers into five sections: Environmental Assessment; Strategic Design; Idea Generation; User centred design; and Information Provision. Table 2.2 below details these types and some examples:
<table>
<thead>
<tr>
<th>Type</th>
<th>Explanation</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Assessment</td>
<td>These quantitative tools are typically most beneficial during early design development stages where they can evaluate an existing design, identify opportunities for improvement, and provide a benchmark against which designs and other existing products can be compared.</td>
<td>Life Cycle Assessments&lt;br&gt;MET Matrix&lt;br&gt;Eco-Indicator 95 &amp; 99</td>
</tr>
<tr>
<td>Strategic Design Tools</td>
<td>Useful during early product design process for identifying areas of product to be improved and at the late stages of product development process for re-evaluation once improvements have been made.</td>
<td>Ecodesign Web&lt;br&gt;Design Abacus&lt;br&gt;Fast Five&lt;br&gt;Six Rules of Thumb</td>
</tr>
<tr>
<td>Ideas Generation</td>
<td>These wide ranging and varied tools that promote creativity can be used at any stage of the design process.</td>
<td>“Information/Inspiration”&lt;br&gt;Flowmaker&lt;br&gt;Creativity Techniques</td>
</tr>
<tr>
<td>User Centred Design</td>
<td>Used mainly in the early stages of the design process, these techniques are useful for informed design decision making by giving the designer an insight into the relationship between people and products.</td>
<td>Participant Observation&lt;br&gt;User Trials&lt;br&gt;Product-in-use&lt;br&gt;Scenario-of-use&lt;br&gt;Layered Games&lt;br&gt;Mood Boards</td>
</tr>
<tr>
<td>Information Provision</td>
<td>Can be used throughout the design process, but is often more use towards the end of development to get up to date information about issues such as legislation.</td>
<td>“Information/Inspiration”&lt;br&gt;Real People</td>
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</table>

Table 2.1 Methods and tools (adapted from Bhamra and Lofthouse, 2007)

Depending on what designers need, they may use one or other of these. With a range of tools and methods, designers have a choice in selecting one that may enable a detailed or in-depth picture to be built up, or an overview; some are more useful at different stages of the design process; some are visual and thus enable explanation to others in a company who have lower understanding of the issues; others are specific with quantifiable results which can be compared. A
number of tools however also can mean that at different stages in production, colleagues may be using different tools; with no industry standard, comparisons between products are potentially not possible and there is less opportunity for a standard training programme for designers in using a tool. Ecodesign tools can be combined together in order to achieve a more sustainable design solution (Bhamra and Lofthouse, 2007).

Today numerous examples of LCA tools are available on the market, mostly taking the form of professional software such as SimaPro. In 2006 Giudice et al. specified three main categories into which the various methods and tools currently used in design practice fall into: complete, simplified and feature-specific LCAs. If conclusive, a complete LCA can be a very useful tool for ecodesign by informing the design process, but is rarely used in the product development phase as it requires a lot of time, and therefore money (Tischner et al., 2000; Bhamra and Lofthouse, 2007) and considerable quantities of data are not available (Giudice et al, 2006). It is because of these factors that tools have been developed to encourage the use of simplified LCAs during the design process. Examples include the LiDS Wheel devised by van Hemel in 1998, later developed in 2003 by Bhamra and Lofthouse into the Ecodesign Web (Bhamra and Lofthouse, 2007) and the Design Abacus (Shot In The Dark, 2007 cited in Bhamra and Lofthouse, 2007). Additionally there are a large number of databases covering various issues across a range of media available to aid designers with their design decisions. Many of these provide assistance, information and ideas connected with ecodesign, such as provide information about materials, links to sources and suppliers, and often include images of products made from ‘eco-friendly’ materials for example and inspiration. A popular printed source has been the Eco-design Handbook (Faud-Luke, 2002, 2005), featuring a database of ‘eco-friendly’ materials. The book also includes a list of manufacturers and suppliers, a checklist of attribute characteristics to consider when selecting materials and the embodied energy values of some common materials. Extensive materials databases available online include those available through the Rematerialise and Materia websites. This is a compilation of ‘eco-smart’ materials that provides a range of environmentally responsible alternatives to other resource-hungry materials.
Bhamra (2004) and Karlsson and Luttrop (2006) state that implementing ecodesign at the earliest stages of the PDP is more effective than any tool that is used once the design process is already underway. Although tools can, therefore, be seen as one possible strategy, they alone will not be effective unless accompanied by other factors; Le Pochaf et al. (2007) suggest integrating tools into companies’ practice. Rosemann and Meerkamm (2004) also say that tools are necessary for development work; similarly, Kobayashi et al. (2005) emphasise the need for tools that allow for the calculation of the eco-efficiency of the product. What Tukker et al. (2001) called “advanced firms” showed a commitment amongst management to take into account sustainable development in their company strategy and procedures; experienced staff, tools and data available for use in the eco-design process. They embark upon eco-redesign as well as product innovation. However, they also note that the most active sectors or companies are those most under pressure from regulation regarding “end of life” for packaging and waste.

However, design tools for products can be complex and might not be used in practice (Howard and Knepper, 2011). As Mathieux et al. (2007, p.1) point out:

‘Although a lot of product environmental impact assessment and Design for Environment tools already exist, environmental aspects are unfortunately rarely routinely integrated into product development processes in the industry. This is mainly due to the fact that current ecodesign tools are little adapted to designers’ practices, requirements and competencies.’

Indeed, this can be especially true for SMEs who are less likely to have the resources and expertise required to use ecodesign tools (Le Pochat et al., 2007; Prendeville et al., 2011). Berchicci and Bodewes (2005) emphasised that ‘scholars need to incorporate environmental issues into established theories on NPD [New Product Development]. Adapting existing theoretical models may help practitioners in their struggle to integrate the E [Environmental] into NPD.’ (p.272). Nevertheless, Luttropp and Lagerstedt (2006, p.1396) state:
‘there is a strong need for a tool to facilitate the integration of reasonable environmental demands into the product development process.’

Education among industrial designers clearly varies, but some trends may be visible. De Eyto et al. (2008, p. 333) note that ‘[a] clear majority of students in all classes […] felt that sustainable design was of significant importance’. Importance aside, de Eyto et al. (2008, p. 334) also valuably highlight a tendency for design students to ‘receive detailed analysis of specifics without being able to achieve joined up thinking as a final skill’, suggesting that team work will remain crucial for graduates of design, working alongside (ideally) similarly specialised engineers and marketers but each having a disciplinary focus. The suggestion here is that the overall picture of the importance of ecodesign and ways to ensure joined up thinking may be forgotten:

‘It is apparent that students need to develop a broad sustainable literacy throughout their education and yet often this can become lost in the overall syllabus without sustainability focused modules or projects’ (de Eyto et al., 2008, p.340).

This could account for the differences between students and practicing designers’ realities. Beyond student learning, Bianchi and Noci (1998) said that stakeholders, including research centres, should provide SMEs with resources that encourage them to both develop cooperative relationships and create the necessary conditions for innovation.

Dangelico and Pujari (2010, p. 481) note that companies ‘acquire knowledge from a variety of sources’ that are communicated through sustainability plans or ethical codes, providing ‘general directions’ for reducing environmental impact. Lefebvre et al. (2003, p.277) found that ‘environmental initiatives are associated with the development and accumulation of managerial and technological expertise. They continue by highlighting that learning in one company is linked to learning, knowledge and activities of their supply chain and customers. Recalling the notion of the environmental champion, for Pujari (2006), the success of development of ecodesigned products depends on the availability at
each stage of an environmental specialist sharing his/her knowledge with the design team. Designers feel that ‘best practice sustainable product design’ has yet to be achieved for a variety of reasons, including lack of skills and appropriate tools/methods/knowledge sharing (Richardson et al., 2005). Knowledge of ecodesign is then potentially of value for all colleagues. Designers play a role in the PDP in SMEs, although it varies by company and that their knowledge and capability affect outcomes.

This section has examined the evidence on the place of industrial designers in ecodesign. Designers have a role in ecodesign but it varies by company. Designers have much of the responsibility for implementing ecodesign, and they have a role to play in educating others in their company. The effort and risk of pursuing an ecodesign strategy or designing an “environmentally friendly” product means that ways of communicating this to customers, such as through environmental labels, are valuable.

### 2.3 A critical appraisal of environmental label impact in the UK

Having outlined current research on designers’ use and knowledge of ecodesign, this section turns to address environmental labels specifically, critically appraising the impact of labels. Environmental labels are an effort by companies to make consumers aware of what they have done either as a company or to the product. Environmental labelling is a form of market information that communicates the ‘socio-ecological performance of products’ to consumers, in a way that should change patterns of consumption and production (Bratt et al., 2011, p. 1631). Galarraga Gallastegui (2002) said that eco-labelling has two aims:

- ‘to provide consumers with more information about the environmental effects of their consumption, generating a change towards more environmentally friendly consumption patterns, and
- to encourage producers, governments and other agents to increase the environmental standards of products/services.’ (p.316-7)
A third aim might also be considered, gaining competitive advantage (Markandya, 1997, cited in Rubik and Frankl, 2005). Rubik et al.’s (2008) main objectives for labels are three-fold: for suppliers to receive signals about the requirements for a product; for customers to be informed about what is available in the market; and ultimately or most importantly, labels should have net environmental benefits.

Labels may improve image and sales, improve customer knowledge of environmental issues, and improve company accountability for environmental impact (Morris, 1997). Towards the end of the twentieth century environmental labelling was thought ‘to have the potential to harness both consumer awareness about the environment and the growing interest, within some sectors of industry, in producing environmentally sound products’ (Erskine and Collins, 1997, p.126). Legislation has also been passed to improve the impact industry and products have on the environment and some labels identify compliance with the law.

Houe and Grabot, (2009) consider Type I labels (defined in Chapter 1) to have been the most successful, since Type II labels are self-attributed and hence not as impartial, and were largely responsible for greenwashing in the past, and Type III labels are still rare. Yet among the eco-label schemes analysed by Horne (2009, p.178) there was no consistent pattern of label ‘strength’ around a particular type. Success is vital for labels, as a key element in attaining sustainability is the success of green products on a large scale (Dangelico and Pujari, 2010).

There are numerous criteria put forward for evaluating the success or failure of labels (e.g. Erskine and Collins, 1997; Rubik and Frankl, 2005 – see Figure 2.1). Amongst the criteria are impact on reduced environmental degradation; consumer recognition and understanding of labels and the issues they relate to; consumer propensity to purchase; willingness to pay a premium; impact on market such as the development/growth of a green market both from consumers and from public procurement; the size and value of the green
market; and the market share (the number of products in a category that have a label). Following de Boer et al. (2003, p.258), we might consider success in light of claims but also how claims are ‘perceived by the actors in the marketplace, such as producers, retailers, purchasers and regulators’. For Rubik and Frankl (2005, p. 274), success for labels is in being able ‘to induce changes in both manufacturer and consumer behaviour’. Horne (2009) identified four main categories of assessment: coverage; inclusion of stakeholder needs, uptake and acceptance; and outcomes.

**Figure 2.1** Grouping of key influencing factors for success or failure of environmental product information adapted from Rubik and Frankl (2005)

Considering these many success factors put forward in the literature, this section will look at the impact of environmental labels on the environment; on consumers; on the market; and on companies (also Salazar Ordoñez and Buitrago Suescun, 2010). In this section, labels will be grouped together into compulsory and voluntary, Type I, Type I-like and Type II labels (see classification of labels defined in Figure 1.21). Where research is specifically on a particular type of label, this will be highlighted.
2.3.1 Impact on the environment

‘Obviously, not all EPIS [Environmental Product Information Systems] follow the same specific goals, but all of them have the same common objective: to promote environmental improvement.’ (Rubik and Frankl, 2005 p.78)

Evidently, the success of environmental labels must primarily be on the environment: reducing the effect of a product on environmental degradation. It may however be difficult to accurately quantify or directly attribute impact on environmental degradation, be it positive or negative (Allen, 2000). For some labels, there is a lack of evidence on environmental impact. It may not be possible, finds Horne (2009), to model marginal changes arising from product substitution of a labelled product for an unlabelled product, given the range of variables involved in measuring conservation of natural capital. This is exacerbated since many label schemes do not require a life cycle analysis (Horne, 2009). Unexpected survey results from Golden et al. (2010) stated:

‘Only 44% of single-standard labels have conducted an impact study to assess the effect of their certification efforts on the environment. This is surprising, given that one criterion for a successful label is the extent to which the organization can demonstrate positive on-the-ground impacts resulting from its labeling program’ (Golden et al., 2010, p.6).

For some types of environmental degradation, the transboundary nature may mean that environmental labels are limited in their effectiveness even if consumer demand is high (Robertson, 2007). Nevertheless, for single criteria schemes it is ‘simpler to model marginal benefits […] although of course they are silent on ‘total’ environmental performance’ (Horne, 2009, p.180). Bougherara et al. (2005) argued that environmental labelling schemes can increase purchases of ecodesigned products but that this can lead to over-consumption, worsening the problem. Additional concerns include questioning whether single issue labels such as carbon footprinting are helping or hindering sustainable development and consumption (Schmidt, 2009) because they do
not look broadly enough. Rex and Baumann (2006) point out that some studies suggest that label use may have a positive impact but alongside “other factors”, they make it difficult to quantify. Additionally, it could be argued that labels block environmental innovation because their criteria are based on current products, meaning that innovative products may not meet the criteria (Rex and Baumann, 2006). ‘Ecolabels can be useful in communicating about sustainability, but they should remain a means and not become an end’ (Seifert and Comas, 2012, p.4).

When considering the environmental benefits of environmental labelling Rubik et al. (2008) point out that it is important to look at both direct impacts and indirect potentials of environmental labels. Direct environmental benefits (‘performance’) mean environmental improvements attained through the practised application of environmental labelling on products and services. Indirect environmental benefits mean environmentally positive impacts induced by environmental labelling schemes on surrounding policy, businesses and society (e.g. criteria as an informal ‘standard’, the environmental labelling multi-stakeholder approach as an initiator for cooperative action, etc.). This distinction, according to Rubik et al. (2008), enables consideration the different opportunities that environmental labelling can produce. Golden et al.’s (2010) review of literature ‘found very little evidence of empirical studies that assessed the causal link between certification/ecolabelling efforts, and real improvements in social and/or environmental outcomes. […] Connecting best practices, standards, and actual practice may begin to provide insight into the critical question of certification efficacy’ (Golden et al., 2010, p.44).

2.3.2 Impact on consumers

Back in 1991 Young suggested that ‘[e]co-labeling programs can put basic environmental information into the hands of shoppers at the time of purchase’ (p.34). In contrast to environmental impact, data does exist on consumer awareness of eco-labels (Rubik et al., 2008). In recent years growing concerns about climate change and environmental deterioration has seen an increase in
the popularity of labels (UNOPS, 2009). However, this is disputed by the work of Fletcher and Downing (2011b) whose research on UK consumers questions the popularity of labels and the extent to which consumers understand what a label means. Often if a label is not recognised, consumers may guess at its meaning, with varying levels of success. Consumers have to work out what a label means, if they trust the claim being made, and if they find it to be worthwhile to purchase. In evaluating research on consumer recognition of ecolabels, Thøgersen (2002) reviewed studies of consumers in a variety of countries and pointed out that few studies look at why consumers know, notice and use labels in their decision making; little is known about how consumers may make those decisions. Thøgersen contemplates that the decisions based on environmental labels may be so small as to be insignificant in relation to consumers’ overall purchasing decisions. Those consumers who do pay attention to environmental labels are often those who believe that considerate buying can be a means for protecting the environment. In order for consumers to take label information into account they need awareness, comprehension, a positive attitude and intention to buy an environmental labelled product (Thøgersen, 2002).

The different emphases and criteria have been highlighted as causing confusion for consumers (Edser, 2009; Gallaraga Gallastegui, 2002; Golden et al., 2010; Seifert and Comas, 2012). The proliferation of environmental labels in the Western market is amusingly captured in the cartoon in Figure 2.2. While customer confusion is noted here, the number of labels shown in the cartoon does suggest that companies are using labels such as “carbon offset” and “petroleum free” to market their product and hence earn market share or greater sales, even if the overall effect for consumers is a difficulty to see the actual product. The number of labels available may be the culprit here, Gallaraga Gallastegui (2002) argues. Schmidt (2009) suggests that different labels offer different types of information, thus affecting readability and comprehension. Schmidt (2009, p. S9) suggested that, in principle, ISO Type III labels could be a solution if ‘the facts and meaning of the label are communicated in an understandable manner’.
Figure 2.2 ‘Tower of Eco Babel’ (Fishburne, Tom, 2007)

Figure 2.3 shows Fletcher and Downing’s (2011b) findings concerning consumer familiarity with a range of labels that are used in the UK, including a label (“Environmentally friendly”) that the researchers had invented themselves (which had a surprisingly high reported familiarity, despite being a fake label). Consumer familiarity with many of the labels was low, although at least one in four reported being very or fairly familiar with the FSC, Soil Association, Green dot and A-G Energy Efficiency rating labels.

As the A-G Energy Efficiency rating was distinctively the most recognised label, Fletcher and Downing (2011b) conclude that consumers pay most attention to labels on large purchases such as white goods. Affecting label effectiveness for consumers is the ability to use information to make meaningful comparisons between competing products, through the right sort of information (Golden et al., 2010). Tang et al. (2008) found that environmental labels with visual and text information had greater effects on purchasing than labels that had only
visual or only text information. This may apply to the A-G Energy Efficiency rating.

‘(82%) respondents who had seen the A-G energy efficiency rating label showed a specific understanding of what it meant. A similar pattern was evident for the Soil Association organic mark (76% who had seen it had a specific understanding) and Carbon Trust footprint (75% who had seen it showed a specific understanding)’ (Fletcher and Downing 2011b p.4).

Figure 2.3 Consumer familiarity with green labels (Fletcher and Downing, 2011b, p.4)

Mills and Schleich (2010) indicate that households who are aware of their energy bills and the cost of their electricity may be more likely to purchase more energy efficient goods; and those with class A efficiency-rated goods also appear more likely to purchase class A again. Ward et al. (2011) surveyed US consumers and found that ‘refrigerator consumers who are influenced by the Energy Star label appear to be motivated not only by energy cost savings, but also by the promise of reducing environmental damage associated with energy consumption’ (Ward et al, 2011, p.1457).

Sønderskov and Daugbjerg (2011) argue that governments can increase green consumerism through active involvement in eco-labelling. This contrasts with
Erskine and Collins’ (1997) earlier claim that higher government involvement in the management or setting of label criteria negatively affected consumer confidence in the label’s “green” claims. This difference in findings could be a result of potential increases in trust in recent administrations, or the gradual increase in the visibility of Type I-like labelling schemes. A survey of Australian consumers by D’Souza et al. (2006) indicated that they are more satisfied with labels when they are certain that the information is accurate. A large number of consumers always read labels (over two thirds of their respondents) but some feel they are hard to read. Most disagreed that green products or those with labels are a lower quality than normal products. Where there is low trust in the information in labels, the application of labels to products may indeed have no positive impact on sales or an increase in green consumerism.

Environmental labelling has an important role to play in the education of consumers for improving environmental protection (Erskine and Collins, 1997). If knowledge is low, labels have been identified as a good way to stimulate awareness of environmental issues or make green products more recognisable (Dangelico and Pujari, 2010; Bratt et al., 2011) and possibly even increase demand for labels (Bougherara et al., 2005; Rubik et al., 2008). Even if labels are not used specifically in purchasing decisions, they can make consumers more aware in general of sustainability issues (de Boer, 2003). Following Gallaraga Gallastegui (2002) it can be established that consumers in general have a positive attitude toward environmental issues, and hence a willingness to find information about environmental impact and incorporate that into their decisions (also Pedersen and Neergaard, 2006).

Tukker et al. (2001, p.158) further qualify claims of consumer willingness to purchase in stating that only ‘in exceptional circumstances [are consumers] willing to pay a premium for environmentally friendly products’. However, more recently Bruce and Laroiya (2006) outlined that empirical testing indicates that many consumers are willing to pay a premium for eco-labelled products (Grumpper 2000; Imkamp, 2000; Loureiro et al. 2002; Makatouni 2002; Moon et al. 2002, all cited in Bruce and Laroiya 2006) and showed that consumers do purchase such products (Carlson et al. 1993; Lathrop and Centner 1998; Teisl
et al. 2002, all cited in Bruce and Laroiya 2006). Chinese and German consumers have been reported as expressing willingness to pay more for products with eco-labels (Schischke et al., n.d; Shen, 2008). Murray and Mills (2011), researching in the USA, suggest that poorer and non-English speaking households were less likely to own Energy Star white goods, potentially due to higher up-front costs or lesser knowledge of the scheme. British consumers, too, are reported as stating they are willing to pay more for environmentally friendly products (Bhate and Lawler, 1997). Griskevicius et al. (2010) suggest that some consumers choose green products when they are shopping in public and where the green product is more expensive, in order to gain social status.

While purchasing labelled products may indicate an altruistic motive, Horne (2009, p. 179) argues that if consumers see that effects on the environment should be the responsibility of all, they may be reluctant to purchase: '[w]here eco-labels suggest a ‘niche’ product with a price premium, consumers may wish to avoid being in the minority of ‘payers’ while the majority remain as free riders, getting cheap goods’. Similarly, it has been feared that consumers will see the benefits going to the labelling organisation or the producer rather than to themselves (Leire and Thidel, 2005).

As a whole, it is well established that labels are used by consumers for identifying the environmental impacts of products (Gallastegui, 2002; Houe and Grabot, 2009). Additionally, labels can be seen to have a positive impact on consumer behaviours overall (Grankvist et al, 2004; Gottberg et al, 2006). Claims about consumers’ decision making must be made cautiously; Pedersen and Neergaard (2006: p. 25) argue that consumers who ‘act consistently when it comes to transforming their values and attitudes into everyday decision-making’ are relatively few or are difficult to identify as a stable group. Their purchasing cannot guarantee sustainable development. Pedersen and Neergaard (2006) go on to say that as a whole, consumers’ decisions are complex. While it was established above that consumers recognise many labels and have a positive attitude, caution is needed surrounding consumers’ self-reported purchasing of environmental-labelled products (Leire and Thidell, 2005). There may be discrepancy between what consumers say they do and

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what they actually do. De Boer (2003) notes that actual purchasing decisions can be a disappointment to companies who pursue a green market segment.

We know there are a number of factors that intersect with labels to affect consumers’ purchasing decisions. Products must be competitive on price and performance (Allen, 2000; Seifert and Comas, 2012,); functionality (Schmidt, 2009); and quality (Gallaraga Gallestegui, 2002). Additionally, Horne (2009) and de Boer (2003) highlight the interplay of brand trust or loyalty, social practices and consumer habits in selecting labelled products. Since the start of the economic downturn of the last five years, ‘it appears that consumers are less motivated to purchase green products’ specifically for the sake of being green (Golden et al., 2010, p.8). Cost based needs may be highest in consumers’ minds currently (Howard and Knepper, 2011). However, this climate may change again as economic recovery and growing concerns with resources pick up. Houe and Grabot (2009, p. 21) said ‘it seems that individuals’ [consumers’] awareness has now reached the point where more expensive but environmentally-friendly products can be preferred to cheaper “common” products’. In contrast however, Pedersen and Neergaard (2006) found little evidence of consumers shifting away from environmentally unsound products. Little evidence does not mean that it is not happening, but the message in the literature seems to be that caution must be expressed and the complexity of purchasing decisions must be acknowledged. Evidently, consumers do not constitute a single group. Grankvist et al. (2004, p.213) conducted an experiment to investigate whether consumer preference was affected by positive and/or negative environmental labels on products. They found that ‘individuals who had a weak or no interest in environmental issues were unaffected by either kind of label. Individuals with an intermediate interest in environmental issues were more affected by a negative label than by a positive label. Individuals with a strong interest in environmental protection were equally affected by the two kinds of labels’. Houe and Grabot (2009) consider positive consumer attitudes towards eco-labelled products to be strongly linked with the income of consumers. Any of these consumers may be “selectively green” based on a combination of environmental interest, income, available information, and so on (Horne, 2009).
One thing that might be clear is a need for companies to find the balance between simplicity and full explanation in labelling decisions:

‘Consumers are attracted to simple eco-labels because they provide for clear decision making, but simplicity can undermine efficacy of environmental claims’ (Horne, 2009, p.180).

At other times, researchers can be seen thinking of environmental labelling as something that is communicated between ‘labelling organisations’ and consumers, so that industry and designers are not even in the equation:

‘What labelling organizations must do is make a greater effort to communicate relevant information, rather than simply more information to consumers at the point of sale’ (Golden et al., 2010, p. 12).

The concern with just “more” information is that consumers may get ‘confused to the point where they cannot distinguish between competing products in terms of environmental performance, [and become] unable to express preferences through their purchases’ (ISO, 2012, p.6).

Trust also appears to be a valuable factor. Golden et al. (2010), citing Gallaraga Gallestegui (2002), notes that accurate and verified or verifiable information is a factor in turning willingness-to-pay into actual payment. This again puts emphasis on industry and labelling organisations to pay attention to the type of information they include in their labelling. An emphasis on trust may in part be a result of the bad reputation gained in the early 1990s by greenwashing companies (de Boer, 2003). Following this, consumers may have less trust for industry-led environmental label schemes than government-regulated schemes (Horne, 2009). Compulsory labels ‘generally enjoy broad recognition and support among consumers, and provide a ‘level playing field’ for producers’ (Horne, 2009, p.180). Supporting this, Golden et al. (2010, p. 36) says that ‘government support of a labelling program not only increases its credibility and recognition, but also improves financial stability, legal protection and long-term viability.’ Research by Grankvist et al. (2004) suggests that negative
environmental labels could have a greater impact on consumers with an intermediate interest in environmental issues (than positive labels). It is unlikely that companies would want to apply negative labels to their own products, so this would need to be introduced or implemented by government or a source of information such as a website with list of ‘bad’ products. Like trust, ‘the ‘image’ of products among consumers in terms of environmental issues and the general consumer awareness of the environment are assumed to be crucial factors in product selection by consumers’ (Rubik and Frankl, 2005, p. 63).

Whether or not consumers do in fact make green decisions, some companies perceive that it is so with their customers, and ‘[a]s a result, the manufacturers of these products are increasingly seeking conformity with an eco-label to demonstrate sustainability’ (Edser, 2009, p.2). Golden et al. (2010, p.8) notes that ‘green claims are proliferating fast in the marketplace’. Bougerara et al. (2005) showed that an ecolabelling scheme can lead to an increase in purchases of environmentally suitable products. Customers are sometimes given much weight in terms of their power to change markets through their purchasing decisions (Rubik et al., 2008). Galarraga Gallestegui (2002) also claims that demand may encourage suppliers to apply for labels. Similarly,

‘The generation of consumer information on appliance energy efficiency is … expected to create market incentives for appliance manufactures to design more energy-efficient products’ (Mills and Schleich, 2010, p. 815).

The onus appears to be on consumers to be aware and hence demand labels (or greener products) in order for companies to apply labels to their products. If companies say that there is no market for green products, they suggest that production and consumption should start with customer demand – ‘that the consumer should be the active party’ (Rex and Baumann, 2006, p. 574).

2.3.3 Impact on the market
As the previous sub-section noted, there is a growing awareness among consumers of environmental labels and a need to understand the comparable impact of products, so arguably this consumer awareness is, albeit slowly, affecting the market for labelled products. Rubik et al. (2008) note that considering a purchase of a labelled product can imply that consumers are substituting it for a non-labelled products, and therefore contribute to changes in the market. Also of note is that labelling can be a response to other pressures aside from consumer purchasing, such as to show a commitment to sustainability to environmental pressure groups (Gulbrandsen, 2006). De Boer notes that social or environmental NGOs can apply pressure through their support or criticism of labelling schemes; but they would be unlikely to promote sustainable consumption (for instance of labelled products) ‘without also promoting other themes, such as consuming less, consuming second hand products or consuming products for a longer time’ (de Boer, 2003, p.262).

Measuring market share or demand is important, yet difficult, because of needing to separate the effect of the labels from the effect of other factors, and because market information may be considered confidential by companies (Galarraga Gallastegui, 2002). The impact of labels in the marketplace takes many forms, including market share, sales and number of products carrying labels. However, this may potentially be through developments to the PDP and not the existence of labels themselves. If producers perceive or anticipate demand for environmentally sound products, labelling schemes have an important role in shaping markets and competition (Galarraga Gallastegui, 2002).

Only certain categories of eco-labelled products have had significant impact on the market (Allen, 2000; Bougherara et al., 2005). Small market share should not be a cause for concern regarding label success, argues Galarraga Gallastegui (2002), because one of the goals of some environmental labels, such as the EU Ecolabel, is selectivity. As Allen (2000) points out, the issue with measuring market share of Type I labels is that they are only awarded to the top 5-30% of products (OECD, 1997) anyway (depending on the specific label scheme). The issue remains however that label schemes that are exclusive,
such as the EU Ecolabel, will not cause the whole market to shift towards more sustainability (Fedrigo, 2008). Golden et al. (2010) is unsure of trends in the future. ‘Ecolabels matter more’, says Golden et al. (2010, p. 11), ‘for nondurable, frequently used, and highly visible consumer goods’. This is supported by Erskine and Collins (1997) who imply that labels on washing machines and other infrequent purchases serve little purpose. However, this contrasts with Fletcher and Downing’s (2011b) research onto consumer awareness which found that the A-G Energy Efficiency rating label was most commonly recognised, as discussed in section 2.3.2, although this is a compulsory label. The potential impact of environmental labels also varies from country to country (Houe and Grabot, 2009). Competition between different labels for market share can lead to conflicts of interest between labelling organisations (Seifert and Comas, 2012).

It is also noted that market success can be hard to measure because companies may be reluctant to share this information (Allen, 2000). Additionally, success cannot necessarily be comparative across different labels:

‘Because this pressure [to change patterns of consumption in a more sustainable direction] is not the same in all sectors and industries, it is not feasible to draw generalizing conclusions on the effectiveness of labelling and certification schemes’ (de Boer, 2003, p.262).

Rubik and Frankl also note that market penetration is little researched:

‘Almost no data, for instance, are available on specific supply-side characteristics such as the share of small and medium-sized enterprises (SMEs) among companies having certified their products’ (Rubik and Frankl, 2005, p.75).

They said that monitoring of environmental labels ‘…is restricted to ‘quick and easy-to-measure’ indicators, such as the number of companies awarded a label, or the number of eco-labelled products’ (p.78). Another issue affecting this is that ‘most ecolabeling organizations are unaware of the market share of products, services, or organizations carrying their ecolabels. Only 25% of
labelers were aware of studies that assessed the market share of products carrying their label’ (Golden et al., 2010, p. 6). This is a concern for the overall knowledge surrounding labelling schemes, the ways in which they are implemented and whether or not they have environmental benefits.

Governments have a role to play, setting legislation concerning the environment, regulation of the use of terms (such as organic) and certifying some labelling schemes, and may heavily influence demand for products based on public procurement (Rubik et al., 2008; Seifert and Comas, 2012). Their involvement in schemes may improve uptake of labels (Horne, 2009) and hence be an incentive for companies to change their practices to become more sustainable (de Boer, 2003). Additionally, labels have been seen as advantageous for governments as they offer a more market driven or voluntary move compared to ‘unpopular and costly command and control policies’ (Pedersen and Neergaard, 2006, p.25). Yet it is also pointed out that governments and agencies are critical stakeholders in labelling (Horne, 2009). Between-state trade may also have an impact on the market, with ‘importing countries [resorting] to trade policies and consumer actions in order to reduce negative environmental impacts of the products they consume’ (Engel, 2004, p.1122). Labelling schemes such as the FSC are promoted by (although not run by) governments through public procurement policies, pushing businesses to use the label. The FSC label has been a notable success in the UK, with more than 10,000 product lines in the UK currently carrying it, many sold in major retail stores (FSC, 2014). This is a similar number to the German Blue Angel, currently applied to 12,000 products (Federal Ministry for the Environment, 2014), indicating the strength of the FSC label in the UK.

Melser and Robertson (2005, p. 49) argue that in some cases environmental labels can be viewed as ‘an alternative to more trade-restrictive environmental policies, such as import bans or tariffs on goods with harmful environmental effect’. Environmental labels could also act as technical barriers to international trade because many are national or regional (Melser and Robertson, 2005; Seifert and Comas, 2012). State governments also enhance labelling organisations by ‘welcoming them as desirable and appropriate’ (Gulbrandsen,
Gulbrandsen notes pressure from environmental campaign groups and buyer groups rather than companies showing initiative or responding to market changes.

2.3.4 Impact on companies / industry

If environmental labelling is recognised and used by consumers, and has some market share, it should encourage industry to produce more environmentally sound products, harnessing consumer awareness and interest in environmental issues (Erskine and Collins, 1997) by communicating innovations with improved environmental performance to them (ISO, 2012). The place of industry in environmental labelling is less commonly a subject for research in comparison to consumer or market based research. Labels are presented in research as a motivating factor for becoming more environmentally responsible (Boonkanit et al., 2007). Furthermore, 'labels can prove effective through their influence on design' even if sales do not increase (Salzman, 1997, p.13). Environmental labels were thought to influence product design because no one wants to be placed at a competitive disadvantage, even if the likelihood of lost sales is small, argued Salzman. Gallarraga Gallastegui (2002, p.324) found that 'in many cases, demand has encouraged the supplier to apply for the labels'. As labels have appealed to consumers seeking green products, so Edser (2009) notes manufacturers have sought conformity with a label to demonstrate sustainability. Within the SMEs they interviewed, Dangelico and Pujari, (2010, p.481) note that 'companies were […] aware of the importance of integrating environmental and conventional product attributes, particularly quality and pricing'. Reasons to choose environmental labelling 'might be quite diverse, but they can always be translated into traditional business criteria, aimed at short-term and long-term profits' (de Boer, 2003, p.258). Other benefits assumed for companies include 'enhanced reputation, better market access, lower insurance costs, and lower costs due to more efficient processes' (Miles et al., 1999, p.120). De Boer (2003) argues that environmental labels offer assurances, membership of a select group, and opportunities to market a product in such a way as to distinguish it from competitors in a cheaper or more efficient way than
other marketing strategies. This is considered to make the costs of certification or implementation of the label worthwhile, although these costs can be prohibitive for SMEs (Miles et al., 1999; Hinckle, 2007). Yet, the existence of multiple label schemes, certification programmes and standards seems to be perceived as an incentive for companies; it seems to go without saying that companies would choose to comply, for the good reputation (Collins, 1994), market advantage (Hinckle, 2007) or stability of supply chain that might be offered (Seifert and Comas, 2012).

These are “pull” factors, alongside which “push” factors such as compulsory labelling also exist. Golden et al. (2010) points out that companies have come under increasing pressure in recent years to communicate performance on sustainability measures to stakeholders. In light of this pressure, companies have to decide whether environmental labels can help, and thus choose which labels to pursue (Seifert and Comas, 2012). On a simple level this might be the choice between involvement in a scheme and self-certification; labelling schemes that are seen as successful or reputable are more likely to be taken up by companies for their own self-interest, Golden et al. (2010) argues. Additionally, it has so far been government-run schemes that have been seen as more reputable (Golden et al., 2010).

As with consumers, the literature shows complexities in trying to examine the impact of environmental labels on companies. There must be incentives in terms of sales or profit for companies to adopt labels (Pedersen and Neergaard, 2006). Similarly, altruistic reasons for applying labels have also been mentioned, such as by Bratt et al. (2011, p. 1632) who finds labelling ‘morally as well as economically rewarding’. It is unclear whether the satisfaction of applying an environmental label and hence being greener is enough for many companies. For SMEs, more typical concerns might centre on impact on their practices and profits (Miles et al., 1999). Esty and Winston (2006) argue that SMEs are well placed to adopt environmental labels (or ecodesign in general) because they are nimble, able to change and in some cases have niche markets, although as noted in section 2.1 this nimbleness or flexibility is questioned. Companies may absorb costs (including fees) related to product
standards and certification programmes (Hickle, 2007) although there may be some who would have to pass on the costs to customers, including smaller manufacturers (Miles et al., 1999; Rubik et al., 2008). Commenting on the notion of product stewardship, Hickle (2007) notes that manufacturers may have to internalise environmental costs, and hence ‘they will have an incentive to redesign products in order to reduce their environmental impacts’ (p.2). In the past some SMEs have said that obtaining the EU eco-label is prohibitively expensive as they have to pay an application fee and a percentage of income from the sale of labelled products (Allen, 2000).

However, claims have been made that environmental labels are actually cost effective for SMEs, especially for what they offer. A commitment to labelling has been identified as having positive effects on the uptake of green technologies, as these technologies reduce the costs of offering environmental quality that will enable retention of the label (Amacher et al., 2004). This depends on a number of costs throughout the whole process. Different markets, with different standards and other requirements, further complicate these issues as companies may have to adapt their labelling strategies for different regions, resulting in niche markets, with different processes in different business units rather than at the corporate level (Houe and Grabot, 2009; Seifert and Comas, 2012). Those companies who operate in global market places thus may have to appoint specific staff to oversee compliance and labelling. Dangelico and Pujari (2010) suggest that environmental specialists may be needed in order to combine the management of “tedious” processes. For SMEs, including those only in the domestic UK market, more centralised processes and uniform standards are needed. Seifert and Comas (2003) reiterate the risks of getting things wrong, such as choosing the wrong label. SMEs have been noted as concerned specifically with the cost of third-party certification (UNEP, 2005).

Other researchers have identified the process of applying for an environmental label (such as through doing LCA) not as a motivating factor in becoming more environmentally responsible, but as a benefit alongside saving money. Golden et al. (2010) believe that there is a value in label use for manufacturers in, for instance, increased efficiency and hence profitability. Golden et al. indicate
throughout their report that companies are aware of the benefits of labels and know that they should apply them, indicating that ‘most businesses want to take the high ground’ (Golden et al., 2010, p.10; emphasis added). Other research has noted issues for companies in implementing labels. In order to obtain an eco-label a company must analyse ‘a product according to the rules expressed in natural language which may be difficult to interpret’ (Houe and Grabot, 2009, p.21). The vast field of environmental labels does appear to have been a cause of frustration in companies, according to Seifert and Comas’ (2012) research. Selecting a label is complex, and companies may perceive consumers to be confused. Dangelico and Pujari (2010, p.480) also found ‘organizational issues, notably the management of information flows and coordination of resources within and outside of the product development team’. Again this offers a focus on knowledge and dissemination within companies.

Consumers’ knowledge, or lack thereof, may come into companies decisions around labels. Perceptions of consumer awareness vary, with Dangelico and Pujari (2010) arguing that consumers’ low knowledge is a reason why companies do not develop and market green products or labelled products. They may then have difficulty ‘leveraging products’ green attributes for company advantage’ (Dangelico and Pujari, 2010, p.480). However, using labels in such a way as to increase consumer knowledge, including through third party certification, is a strategy that Dangelico and Pujari recommend for companies. Further issues arise where sectors do not yet have appropriate labelling schemes that might be applied to products (Dangelico and Pujari, 2010). For companies looking to labels for advantage, whatever form that might take, this is frustrating. Other frustrations come when the time required for label certification by the third-party and/or label organisation is prohibitive: Golden et al. (2010) reports an average 4.33 months, although some are next-day, others take one to two years. In addition, the validity period on labels may be short, a difficulty for companies concerned with long term investment (Gallaraga Gallastegui, 2002). Some third party schemes may have low credibility among companies, as Seifert and Comas (2012) highlight, with questions reported over rigour. As Horne (2009) states, there may be as many dangers with environmental labelling as there are opportunities.
While labels are recognised as one strategy among many for improving sustainability, as a form of information they represent a crucial step both in product design and purchasing, and a valuable form of communication among governments or third party certifiers, producers and consumers.

At this point, we can see that the impact of environmental labels has been investigated from consumers’ perspective for many years, with gradual positive shifts in consumer awareness and willingness to buy, or market share for labelled products. At the same time, designers and industry are perhaps assumed to know and accept that labelling will provide a competitive advantage or other economic benefits. Some labels give examples of companies whose marketing and selling campaigns have been strengthened through their use of that label, for instance the Nordic Ecolabel (Nordic Ecolabelling Network, 2014). There have been some case studies of companies who have applied a specific label on that label’s website, for example Dyson and Morphy Richards on the Carbon Trust website. However, detailed information about the application process is not available and key statistics are omitted. Golden et al. (2010) argues that most labelling organisations do not know the market share of the products, services, or organisations carrying their environmental labels; if this is the case, then the role of designers and companies within environmental labelling appears to be an area needing much more in depth research on the actual consideration of the advantages and disadvantages of labels, application processes, and “greener” products as seen through the perspective of industrial designers.

2.3.5 Future of environmental labels

There have been some measurable successes for environmental labelling. Golden et al. (2010) highlights the forestry sector finding enhanced economic efficiency as a result of certification. At the time Rubik and Frankl (2005) published, they claimed that the monitoring of environmental labels was ‘…restricted to ‘quick and easy-to-measure’ indicators, such as the number of
companies awarded a label, or the number of eco-labelled products’ (Rubik and Frankl, 2005 p.78). Hickle (2007, p. 8) has called for a ‘comprehensive strategy for measuring and evaluating the effects of product standards […] to track factors such as the environmental benefits, level of purchaser satisfaction, and product sales associated with each standard’. This suggests that there is little data actually available on the effects or successes. Duplication has been noted as an issue for labelling schemes:

‘28% of responding ecolabels recognized other labels as being equivalent, while 33% of responding labels were recognized by other labels as equivalent.’ (Golden et al., 2010, p.16)

Yet some differences in criteria have also been found to raise issues for companies who operate across different markets, as with this example concerning carbon footprint:

‘The same refrigerator would have a different CO2 value in France than in Germany, its neighbour, since the electricity [supply] mix is different.’ (Schmidt, 2009, p.S9)

Variation across the field in terms of stakeholder involvement or ownership of schemes leads to inconsistencies (Horne, 2009). Environmental labels may also be focussing on the wrong aspects; ‘black’ products, associated with especially significant environmental impacts […] are often avoided by voluntary eco-labelling programs for fear of harming label credibility as a ‘green clean’ brand […] so consumers may not be alerted to the fact that these products are ‘worse’ than those where eco-labels are routinely used’ (Horne, 2009, p.179).

Connelly et al. (2011) claim that there are better ways for companies to communicate their commitment to sustainability to various stakeholders than through the use of environmental labels, such as through ISO14000 certification and investment in sustainable technologies. However, this may only be useful for business-to-business (B2B) and business-to-government (B2G) trade as consumers will be unaware of investment in sustainable technologies – unless otherwise advertised to them – and many will not understand what ISO14000 certification means, again unless they are educated about it; in any case, a
label is considered a good way of communicating this knowledge to consumers. Pedersen and Neergaard (2006) note that environmental labelling programmes may be more cost effective than environmental management systems such as ISO14001. Labels should remain attractive to companies as a way to ensure their products are differentiated from a competitor’s, as procurement requirements are increasingly driven by sustainability, and transparency or traceability of products and supply chains grows (Pedersen and Neergaard, 2006; Seifert and Comas, 2012). Other encouragements include ‘reducing risk, differentiating products from competitors, finding new efficiency and cost saving opportunities, ensuring long-term supply, reputational gains, and realizing a price premium for the product’ (Golden et al., 2010, p.44). The path to success is complex and dependent on multiple actors and stakeholders (Rubik and Frankl, 2005).

Alone, environmental labels may not make much impact (Allen, 2000; Bratt, 2011) and may not lead to huge environmental changes (Melser and Robertson, 2005), but in combination with ‘complementary devices [...] such as consumer education’ (Bougherara et al, 2005, p.15) they may realise successes to a greater extent. Labels affect the whole industry and can be seen as something that all stakeholders have a role in: ‘ecolabels have the potential to raise sustainability awareness and performance across whole industries’ (Seifert and Comas, 2012, p.3). Support is needed from government in multiple ways: support for innovation and regulation of pollution (Kesidou and Demirel, 2012); legislation and goal setting (Erskine and Collins, 1997; Horne, 2009), and procurement (Hickle, 2007). The development of environmental labelling criteria needs to involve relevant stakeholders in a more transparent process (Rubik et al., 2007; Bratt et al., 2011). In his review, Horne (2009) concludes that labels alone are not enough, but needs for information and choice form a fundamental part of how cultures of consumption are created and framed. Reliable communication tools are important for designing and selling products with improved environmental performance (Zackrisson et al., 2008). One key thing here is knowledge: labels are a knowledge provider, raising awareness and increasing ability to make informed decisions on a product or comparisons between products.
Golden et al. (2010) argues that we know little about how companies or managers use certification or labelling, how they make their decisions about value to the company, and what outcomes they can measure. Golden et al. finds that this type of information will help certifiers to provide real value to customers but also help educate managers on how they might make the case in their organisations. Arguably this education should be available to a number of people in a company, including designers.

Labels remain a valuable instrument to steer consumers and supply chains in a sustainable direction (Bratt et al., 2011). Although only a ‘first step’, labels show potential to increase ‘pressure on producers and consumers to steer their behaviour in a particular direction’ (de Boer, 2003, p.261). Information sources (such as labels) alone will not achieve great change, but prepare the ground for further measures. The information provided must be the most relevant for responsible purchasing, not to inundate consumers with data, to paraphrase Golden et al. (2010). Schemes must measure their success in terms of fulfilling their objectives (Rubik and Frankl, 2005). Horne (2009) argues for involving consumers in discussion of consumption practices rather than just presenting information to them; Rubik and Frankl (2005) add that the internet as a source of information could be harnessed to a greater extent, alongside on-pack information. This must surely demonstrate a need to involve designers and companies in this conversation.

2.4 Environmental labels and industrial designers

As it has been established that labels still have relevance and could play an important role in the future, the study now goes onto look at influence of labels on designers. As labels fall under the remit of ecodesign, it has been necessary to look first at ecodesign in relation to companies (Section 2.1) and designers (Section 2.2) in order to understand the context here. This section aims to look at what, if any, impact environmental labelling has on industrial designers during the PDP. Environmental labels’ importance for the PDP and products
themselves are of interest, because the literature has indicated that designers could have a crucial role in influencing the impact that the products they design will have on the environment.

### 2.4.1 Labels in designers’ work

Goggin (1994, p.459) noted that ‘given the role of designers in the development of ecolabelled goods […] ecolabelling could increasingly impact on product design’. Rubik et al. (2008, p.402) indicated that ‘environmental concerns are increasingly affecting the choices of designers’. At design brief stages also, incentives that originate with customers and suppliers might result in concerns for product innovation including meeting label requirements (Rubik et al., 2008). Schischke et al. (n.d) argue that eco-labelling should be considered part of the business environment at the planning stage alongside legislation, customer, market needs and competitors’ products.

Businesses could potentially decide to use an eco-label without changing the products, although evidently only if the product already fulfils all the requirements; ‘the other case is if the product itself must be changed, either by modifying its composition or materials, or by changing its environmental features or by improving production processes’ (Rubik et al., 2008, p.397).

> ‘The key question for researchers and practitioners is: How can eco-labelling influence product development?’ (Rubik et al., 2008, p.399)

Some environmental labels can support designers looking to comply with standards on ecodesign, as they can ‘refer to eco-label criteria for their design choices’ (Rubik et al., 2008, p.408). Many of these processes occur through design stages which designers have some control over. Additionally, it can be seen in calls for labels to prompt innovation that this falls under the remit of designers (Rubik and Frankl, 2005; Rubik et al., 2008). For instance, Rubik et al. (2008) highlight label requirements as benchmarks for best practice in ‘product positioning and design’, and the ‘core phase’ of development
processes (p.405). Label criteria can offer designers suggestions on a number of stages in the design of a product, including how to couple environmental performance with quality performance, cost and technical feasibility. Yet Rubik et al. (2008, p.399) also find that ‘few empirical studies have dealt with the subject of changing manufacturers’ product development strategies to adapt to existing or newly elaborated eco-labels, or to their requirements’. Certification programmes and product standards, argues Hickle (2007), affect design, manufacture and logistics stages. Designers need to know the achievable performances and the best ways in which these can be achieved (Rubik et al., 2008). We are also unclear, state Rubik et al. (2008) on the extent to which innovation is a direct result of work to apply a label.

2.4.2 Designers’ knowledge of environmental labels

Expertise is needed in labels in order to make sense of the numerous rules they include, according to Houe and Grabot (2009). Problems in using environmental labels, they find, include a need for a step-by-step approach. Firstly, a consideration of the assistance that is available. Labels can be hard to interpret and design frames or diagnosis aids may be required – such as tools to help collect data on eco-efficiency (Kobyashi et al., 2005). For Michelini and Razzoli (2004), design frames and diagnosis aids are required in order to establish the life-cycle visibility that is requested by some environmental labels. Other case studies also conclude that in spite of the help indirectly provided by an environmental label, competence on environmental issues is necessary, and must be acquired during the process if not available at its beginning (Seidel et al., 2006, cited in Houe and Grabot, 2009).

Rubik et al. (2008) identified that literature finds poor quality information, or high costs of retrieving useful information, to be major barriers for environmental-oriented new product development. There are some sources of information about environmental labels that are available predominantly on the internet. These include government websites (e.g. defra.org, directgov.org), websites of labelling organisations (e.g. Carbon Trust, Forest Stewardship Council), or
environmental label information databases (e.g. ecolabelindex.com). These websites are frequently developing to incorporate new or relevant information, and have moved on even in the five years since Rubik et al. were writing. At that time, designers noted that they required more information to help them fully evaluate greener alternatives, specifically requiring data on costs and performances in comparison to traditional alternatives (de Eyto et al., 2008). Some information and guidance is available in the form of standards, however they have been accused of being difficult to understand for designers (Houe and Grabot, 2009).

Reviewing these internet-based sources, information for designers is sometimes found either in interpreting the guidelines, which are not easily understandable, or trying to work out what a label offers from the information aimed at consumers. However, recently there have been developments in the information aimed at industry. Two websites are getting closer to offering methods as well as information, something that Houe and Grabot (2009, p.21-22) recommended, aimed at ‘providing support to the user when checking the compliance of a product with an eco-label’. This may take different forms, for instance supporting designers to choose the best solutions to comply with label criteria; comparing the changes required by different labels; or cost analysis techniques (Houe and Grabot, 2009). Ecolabel Index (formally known as ecolabelling.org) has been providing information on the ecolabel market since 2007. The website is based in Canada and is free to use, although there is also a subscription version of the website. Today (November 2014) the features include a list of all labels (458 in 197 countries); with descriptions, images and information on how compliance with the ecolabel’s standard is ensured; and a link to external website for more information. In the free to use version, the list of labels can be refined by product categories or country that a label can be found in (although this does not mean that the label is relevant in that country). In the subscription service (CDN$99/mo), users can access profiles with more detailed information on each label and compare the attributes of different ecolabels side-by-side. Both the basic and the pro service are valuable to the PDP. In addition to this, they have also offered a consultancy advisory service, working with clients to navigate the ecolabel field and meet stakeholder needs.
GreenSpec is another website aimed specifically at ‘industry professionals who engage with Green building products and materials’ (GreenSpec, 2013). This includes information about the label, the process involved in environmental labelling, and checklists similar to those suggested by Kishita et al. (2010). The UK Government launched the *Green Claims Code* in 1998 to provide guidance to manufacturers on making accurate environmental claims about their products (Allen, 2000). The most recent version, called *Green Claims Guidance*, was published in 2011 (DEFRA, 2011a). DEFRA (2011b) also publish *Defra’s Quick Guide to Making a Good Environmental Claim*. In addition, DEFRA has published the research that led to these guides, offering more specific information such as on consumer understanding of green terms (DEFRA, 2011c), to support designers and companies.

### 2.5 Conclusions

This chapter has explored existing literature on ecodesign and environmental labels. Reasons why designers and companies might carry out ecodesign include legislative push and economic pull. There may be a bigger propensity if there are legislated requirements, with legislation being particularly effective when guiding companies to meet multiple requirements for their products and company operation. Without legislation and standards, industry can succumb to protecting their own interests, resulting in unethical practices and greenwashing. This suggests that ecodesign may be undertaken if a benefit can be seen, although there is scepticism about the economic benefits. Green markets are growing but the short term costs for SMEs can be high and products need to stand out on the market in terms of specification, performance and quality. Hence, SMEs may be especially sceptical. Their ability to do ecodesign depends on the flexibility and innovation in their PDP, and available time, finances, skills and resources. Early integration of ecodesign into the PDP increases the chances of success. This means that colleagues in the company need to be on board, as ecodesign crosses functions. This has not precluded the need for individuals to have the competence and motivation to do
ecodesign. Although designers are not the only people involved in ecodesign, the literature significantly stated that designers, as potential environmental champions, have (or should have) responsibility for knowledge to implement ecodesign and get colleagues on board. If designers do not know about ecodesign, it is their responsibility to find out. To help educate, tools and resources have been developed for designers, although there is a question over the extent to which they are used and/or are effective, especially if they are to be used once the PDP is underway. However, the place of designers in the PDP is a crucial consideration, with designers’ involvement in early stages assisting with success – just like ecodesign needs to be an intrinsic element, not an afterthought. This can be facilitated by designers’ multiple roles (for example, involvement in marketing) which may be more likely in SMEs, although designers’ ecodesign work may be interrupted more often in this structure.

Section 2.3 answered research question 1 on the impact of environmental labels in the UK. It was shown that some labels have enjoyed success in terms of a reduction of environmental impact, increased consumer recognition and market share. The literature has also shown that labels should still be considered a relevant marketing tool for companies. Labels remain suitable because companies need a way to convey information about the product and/or their company’s efforts towards reducing their impact on the environment. This is information that consumers would like to know as their understanding of forms of environmental degradation increases. There is still a place for environmental labels in the future: many consumers value them. There is also a growing demand through public procurement; environmental legislation and compulsory labels are also increasing. It can be hard to measure or evaluate impact of labels and labelling schemes however (Rubik and Frankl, 2005). Literature has tried to measure success in terms of consumer awareness, understanding and market share (Bruce and Laroiya, 2006; Fletcher and Downing, 2011b; Kalmus, 2007; Mackenzie, 1991; Rex and Baumann, 2006; TerraChoice, 2007). Some labelling organisations are unable to quantify how many products use their labels (Golden et al., 2010), partly because they are not directly involved in the certification process. What is possible is to continue
to assess consumer recognition and the extent to which labels may be taken into consideration in purchasing decisions (Fletcher and Downing, 2011b). Even so, there is a difference between the number of consumers who say they would buy a labelled product, and number of sales (Fletcher and Downing, 2011b).

Environmental specialists were recommended for the complex aspects of navigating label criteria (Dangelico and Pujari, 2010). Rubik et al. (2008) highlight the needs of designers if they are to incorporate labels into their design processes (if the label has been stipulated in the Design Brief). Literature claims that designers are increasingly required to be involved in the marketing of products (Design Council, 2007; McDermott, 2007), especially in SMEs (Annable and Burns, 2009), and if labels are a marketing tool then they should be aware of them and how to implement them. There is some literature on labels and designers (e.g. Dangelico and Pujari, 2010; Golden et al., 2010; Rubik et al., 2008; Seifert and Comas, 2012) that offers indications how labels (should) fit into designers’ work. Specifically within SMEs, it remains unclear as to where labels fit into the PDP, how and whether SME in-house designers are implementing labels and what factors affect this, especially their knowledge and understanding of labels and schemes, given the complexity of label processes and nature of SME designers’ work (Annable and Burns, 2009; Design Council, 2007; Houe and Grabot, 2009). The absence of much consideration of designers in the literature appears to suggest that they are assumed to already know what they need to know. Evidently designers have a significant impact on the outcome of a product. Previously, research has focused on companies as a whole and not designers in the companies, although it has been hypothesised that environmental labels impact on product design (Goggin, 1994). Labelling criteria can be seen as a base upon which to make design decisions. Combining this with the literature on ecodesign in which designers were seen as responsible for knowledge and education, there is a need to investigate further into designers and environmental labels. Questions remain on the role of designers in gaining and disseminating knowledge about labels; the place of designers in the PDP and consequent effect on their ability to apply labels; whether designers design with label criteria in mind; and whether they check for compliance.
To support the future of labelling, it is important to investigate further designers’ knowledge and understanding of environmental labels and schemes, and hence their capability to implement them in their work. Hence, a number of research questions remain unanswered:

2. Where do environmental labels fit into the PDP of SMEs?

3. What do in-house industrial designers in SMEs understand about environmental labels and schemes?

4. How do environmental labels and schemes currently affect in-house industrial designers in UK SMEs?

5. What information do in-house industrial designers claim to need and want to know about environmental labels and schemes?

6. What are the factors affecting in-house industrial designers’ implementation of environmental labels in their work?

Empirical work is required to answer these research questions and satisfy the remaining objectives of the research project. Chapter 3 will present the methods and methodology behind the subsequent empirical research.
3 RESEARCH METHODOLOGY

As introduced in Chapter 1, the overall aim of this research is to investigate factors currently affecting in-house UK SME industrial designers’ implementation of environmental labels. Following this review of existing literature, further data were required to more fully address the research questions. Chapter 2 addressed the first research question: to what extent have environmental labelling schemes been successful in the UK? The remaining five of the original six research questions have yet to be addressed are:

This chapter addresses the selection and justification of the methodology employed for this study and subsequently the methods of data collection and sampling, issues of ethics, analysis, validity and reliability.

3.1 Research purpose

Methodology literature identifies that there are four different reasons for carrying out a research study: Exploratory, Descriptive, Explanatory (Robson, 1993, 2002; Yin 1994), and Emancipatory (Marshall and Rossman, 1999) (see Table 3.1 below). This project is not about proving or disproving existing knowledge, but to build on current understanding and to contribute new ideas.

The research design brings together three stages, two of which (the Preliminary Study and Main Study) were of an exploratory nature aiming to establish an understanding of the field as has been identified in the Literature Review; the third stage, the Case Studies, took a more descriptive approach to, as it suggests, follow up on the findings of the Main Study.
Exploratory  | To find out what is happening, particularly in little-understood situations.  
To seek new insights.  
To ask questions.  
To assess phenomena in a new light.  
To generate ideas and hypotheses for future research  
Almost exclusively of flexible design

Descriptive  | To portray an accurate profile of persons, events or situations.  
Requires extensive previous knowledge of the situation to be researched or described, as that you know appropriate aspects on which to gather information.  
May be of flexible and/or fixed design.

Explanatory  | Seeks an explanation of a situation or problem, traditionally but not necessarily in the form of causal relationships.  
To explain patterns relating to the phenomenon being researched.  
To identify relationships between aspects of the phenomenon.  
May be of flexible and/or fixed design.

Emancipatory  | To create opportunities and the will to engage in social action.  
Almost exclusively of flexible design.

| Table 3.1 Classification of the purpose of enquiry (Robson 2002, p.59) |

The overall strategy of the three stages was emergent in design – it developed as data at the exploratory stages illuminated designers’ current and needed knowledge and level of experience of environmental labels. This chapter explains purpose, methodology, data collection, participants and analysis techniques for each of the three stages; however, in brief each purpose is outlined here. The Preliminary Study survey gathered data primarily on label recognition; however the Preliminary Study interviews were aimed at investigating designers’ understanding of labels, labelling processes and previous experience. The Main Study purpose was to use an elicitation tool to further probe: designers’ claims of requiring specific knowledge about environmental labels (a finding emerging from the Preliminary Study); what they could do with this knowledge; and designers’ position and influence within companies. The Case Studies were used to gain an additional perspective from designers who had practical experience of using environmental labels, to investigate their roles in designing a product with an environmental label applied to it, and hence to outline good practice in order to answer research question 6.
3.2 Research plan

The next stage is the selection of an appropriate research plan. Marshall and Rossman (1999) and Gibson and Brown (2009) liken this to a road map which defines the overall strategy for exploring the area of interest of the project. Figure 3.1 charts the different aspects of the project from Preliminary Study, through the Resource Design and Main Study to the Case Studies. Given the multiple stages this research, in the interests of clarity the plan will be outlined first before justification and description of each of the stages’ design frame, methods and analysis.

Following the Literature Review (Chapter 2), the research continued with the Preliminary Study (Chapter 4) designed to gather data from industrial designers. This was done using an online survey questionnaire and a follow-up interview with survey respondents who volunteered for further participation. After this data was analysed, a prototype resource (‘DELR’) was developed using the findings from the Preliminary Study and Literature Review aimed at answering the research questions (Chapter 5). ‘DELR’ was the basis for a test in the Main Study (Chapter 6), where designers were asked to use it during a task analysis which consisted of an observation and semi-structured interview running simultaneously. This was then followed by a feedback survey. Following analysis of the Main Study data and triangulation with Preliminary Study data, Case Studies were conducted which explored the experiences of three UK SMEs in working with environmental labels (Chapter 7). This was done through semi-structured interviews with designers and other professionals within each company. Also in the Case Study stage, additional data were obtained from company websites and social media (Twitter, Facebook and LinkedIn), labelling awarding bodies (e.g. FSC), promotional materials and products. Analysis of, and reflection on, each stage occurred before design and commencement of the subsequent stage(s).
Figure 3.1 Map of Research Framework and Methods
3.3 *Design frame and philosophy*

The element of research that Thomas (2009) labels the design frame provides a framework for linking the purpose of the research with the methods for collecting data. In this project, multiple design frames and methods prompt first an introduction to the paradigm or philosophy in order to justify the decisions made in this project. Initially the positivist and interpretivist paradigms were considered as oppositional (Kuhn, 1970, cited in Thomas, 2009), based in contrasting philosophies of the nature of knowledge and reality. Researchers were encouraged to select one over another based on their own fundamental understandings of the world and how we could know it. This researcher subscribes to an interpretivist paradigm. This indicates to researchers not to look for a single truth or set of solutions. It fits with an emergent approach (Guba and Lincoln, 2005), being flexible and enabling methods to develop as the project progresses (Robson, 2002, 2007; Denzin and Lincoln, 2005; Charmaz, 2006; Richards 2009). Further data collection may be undertaken as additional questions arise or explanation is needed. Recently researchers have turned to more pragmatic approaches to research philosophy, taking the stance that questions and problems rather than paradigm should drive the development of the research (Teddlie and Tashakkori, 2011). Within this pragmatic philosophy, methods can be selected for their suitability in creating or finding answers, rather than out of loyalty to a paradigm. Thomas (2009) supports the possibility of not only mixed methods but mixed designs, with multiple stages of research being designed to suit the question or problem rather than remaining fixed. Bazeley (2013) explains that design frames are sets of guiding principles rather than rules. In this project the plan is informed firstly by a survey design and secondly a case study design.

Other designs were considered but rejected. Ethnographic study, which Robson (2002) defines as researcher immersion in the field and seeking to capture, interpret and explain how a group or organisation lives, would not have been appropriate for this project as the amount of time required for the researcher to join a group of designers within a working environment could not be justified.
This would not have worked because it relies on a relevant job coming in and it does not centre designers’ thought processes like interviews or other reflective methods. Companies were also anticipated as being reluctant to offer access to this depth. It was considered that similarly rich results could be obtained through other less intensive and time consuming strategies that additionally enable an overview of many industrial designers within a number of companies to be involved within the same time span. A case study strategy could have been an appropriate choice for the Preliminary and Main Studies as data would be gathered via interviewing, observing and document analysis (Denzin and Lincoln, 2005). This would have enabled an overview of both company structure and the design process within that company. Again, this would have required considerable time and resources as well as relying on considerable company cooperation. An exploratory survey of a larger number of designers was selected instead to collate a broader range of experiences and knowledge than could have been gained through a limited number of case studies.

Following the Preliminary Study and Main Study data analysis and interpretation, case studies were created to collect further data with in-house industrial designers in UK-based SME-sized companies who have previous experience of using environmental labels. A case study approach at this stage enabled a more in-depth examination of a company’s decision-making and practices regarding their current use of an environmental label. Thomas (2009, p.115) considers a case study to be ‘a rich detailed understanding’. Cases should be chosen that are of special interest; here, this meant designers in companies who are already applying environmental labels to a product. This can be labelled an “instrumental” case (Stake, 2000) - a case that illustrates something in relation to the research question(s), although not necessarily generalisable. However, an instrumental case does offer understanding of the context in which the subject developed. Stake (2000) also recommends cases be selected from which something can be learned. Thus, the cases used in this study may not be representative of all in-house designers in SMEs but offer illustrative answers. In this way we can also be aware of a need for caution as case study designers may choose not to share all aspects of their knowledge, decision making or practices (Gillham, 2000).
For Yin (2008), case studies are both an approach to research and a method; case studies can be particularly useful where the boundaries between the phenomenon and the context in which it appears are not clearly evident: in this way we might think of a company, its designers, their design process and products (the context) as closely tied to their use and knowledge of environmental labels (the phenomenon under investigation). There is no routine formula for carrying out a case study (Moore et al., 2011). This might also apply to analysis: the researcher looks for a chain of evidence that answers the same set of questions, throughout the multiple sources of data. Within these overall designs there are multiple data collection methods, largely but not exclusively qualitative in nature.

### 3.4 Participants

Participants at each stage of the study were industrial designers in UK SMEs. As explained in Chapter 2, designers are individuals who, although they often work in groups and/or as part of a team and interact with other professionals during the design process, have differing design styles, motivations, positions within teams, and life experiences that affect their perspective on environmental labels and/or ecodesign. Therefore it was decided to consider them both as individuals and as part of the design team within a company. The total number of UK industrial designers is estimated at around 230,000 (Labour Force Survey, 2008, cited in Design Council, 2010). There are 83,600 designers employed in in-house teams (Design Council, 2010). These figures are not restricted to SMEs. The group of participants engaged throughout this research project is not taken to be representative of all UK industrial designers; but their responses are seen as indicative of the larger group, offering insight rather than generalisation (Thomas, 2009). Details of the inclusion and exclusion criteria for designers and companies used in this project are detailed in Table 3.2. Across all stages of the research project, 79 industrial designers participated, of whom 41 were interviewed during at least one phase of the research (listed in Table 3.3). Further demographic information about the designers interviewed in the
Preliminary and Main Studies can be found in Appendix vii. They were purposively recruited (fitting the criterion industrial designer working in-house within an SME in the UK) facilitated by elements of snowball sampling (wherein existing participants were asked to suggest others known to them who also fitted the criterion) to expand the base of participants. In addition, four non-industrial designers were interviewed during the Case Studies. More details on the Case Study interviewees are presented later in this chapter. The designers worked in 15 companies (listed in Table 3.4), although the range of designers is more important to the study and its findings than the range of companies. It is also important to point out that each study was separate from those before and that involvement by companies and designers in more than one stage of the research was not predicated on their previous involvement. At the start of each phase of data collection participants were informed about the history of the project and during each had the opportunity to ask the researcher questions. Recruitment and sampling is described in detail in section 3.5.1.3.

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<thead>
<tr>
<th>Company / Designer</th>
<th>Inclusion Criteria</th>
<th>Exclusion Criteria</th>
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<tbody>
<tr>
<td>Type of designer</td>
<td>In-house designer (current or previous)</td>
<td>Consultancy or freelance only designer</td>
</tr>
<tr>
<td>Designer discipline</td>
<td>Industrial designer</td>
<td>Not an industrial designer (e.g. Graphic designer, engineer, etc).</td>
</tr>
<tr>
<td>Company size</td>
<td>SME</td>
<td>Large company</td>
</tr>
<tr>
<td>Location (of design activities)</td>
<td>Design activities UK-based</td>
<td>Company based overseas</td>
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Table 3.2 Inclusion and exclusion criteria for designers and companies
<table>
<thead>
<tr>
<th>Company</th>
<th>Participant (* if not industrial designer)</th>
<th>Preliminary Study Survey (ID)</th>
<th>Interview</th>
<th>Main Study Interview</th>
<th>Feedback Survey</th>
<th>Case Studies</th>
</tr>
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Table 3.3 Details of designers interviewed during the Preliminary Study, Main Study and Case Studies
<table>
<thead>
<tr>
<th>Company</th>
<th>Market / Industrial Sector</th>
<th>Main Products</th>
<th>Market Served</th>
<th>Size (approx.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company A</td>
<td>Outdoor &amp; camping products</td>
<td>Rucksacks, Tents, Drinks bottles, personal GPS systems, etc.</td>
<td>B2C, B2B</td>
<td>40</td>
</tr>
<tr>
<td>Company E</td>
<td>Furniture</td>
<td>Chairs, Tables</td>
<td>B2C</td>
<td>25</td>
</tr>
<tr>
<td>Company F</td>
<td>Domestic Kitchen products &amp; utensils</td>
<td>Electronic products (e.g. choppers), Utensils (e.g. folding grater)</td>
<td>B2C</td>
<td>75</td>
</tr>
<tr>
<td>Company G</td>
<td>Stationary, Packaging, POS</td>
<td>Self-assembly storage, files, boxes, POS displays, etc.</td>
<td>B2B, B2C</td>
<td>100</td>
</tr>
<tr>
<td>Company H</td>
<td>Domestic Kitchen products</td>
<td>Food slicers, choppers, sealed storage containers</td>
<td>B2C</td>
<td>30</td>
</tr>
<tr>
<td>Company K</td>
<td>Industrial &amp; Domestic electrical goods</td>
<td>Vacuum cleaners, vacuum pumps</td>
<td>B2B</td>
<td>50</td>
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<tr>
<td>Company L</td>
<td>Outdoor and camping products</td>
<td>Jackets, Sleeping mats, Tents, camping utensils</td>
<td>B2C</td>
<td>40</td>
</tr>
<tr>
<td>Company M</td>
<td>Various (Consultancy)</td>
<td>Various, including medical, domestic electrical, kitchen products</td>
<td>B2B, B2C, B2G</td>
<td>15</td>
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<tr>
<td>Company N</td>
<td>Single-use plastic products</td>
<td>Vending cups, disposable cutlery</td>
<td>B2B, B2C</td>
<td>75</td>
</tr>
<tr>
<td>Company P</td>
<td>Casket Manufacture</td>
<td>Design and manufacture of Coffins, Caskets, etc.</td>
<td>B2C, B2B</td>
<td>100</td>
</tr>
</tbody>
</table>


Table 3.4 Details of companies (all UK SMEs) involved in the research project (Preliminary Study, Main Study and Case Studies)

3.5 Data collection methods

The data collected through the Preliminary Study consisted of survey responses and interviews; Main Study, interviews, observational notes, and surveys; and the Case Study, interviews and web-based inquiry. By triangulating data a richer picture can be built up by viewing a phenomenon from multiple perspectives (Denzin, 1978; Moore, 2006; Richards, 2009).
3.5.1 Preliminary Study

The aim of the Preliminary Study was to construct an initial understanding of what industrial designers working in-house within UK SMEs know about environmental labels, how environmental labels currently impact on their work, and what they would like to know about them, in order to move towards answering the research questions formed following the literature review. It was decided that the best data would be obtained through an online survey strategy for designers, and follow-up interviews with a selection of these respondents.

3.5.1.1 Survey of designers via questionnaire

An initial survey of practicing industrial designers in the form of an online questionnaire was considered to be the most suitable method of gathering data from a large number of designers in a short period of time (Robson 1993, 2002). The survey was structured into several sections, each concerned with answering different questions and consisted of a combination of open and closed questions. The cover sheet for the online survey can be found in Appendix i. The two survey questions can be found in Appendix ii and iii. Background information about respondents can be found in Appendix iv. A breakdown of the sections within the surveys are described below:

About you: The survey design followed the convention of having basic demographic and sensitive information at the start (after the introduction to the project and the questionnaire) following a point raised by Rugg and Petre (2007) who suggest that it is better to start with the questions that could be conceived by some as intrusive, so they can refuse at the start. This section was aimed at identifying basic information about the participant such as job title, years of design experience, and type of product(s) they design. As well as being relevant data, it was anticipated that respondents may feel more relaxed starting with questions they knew the answer to and tended to take the form of closed questions.
Your Job/Work: This section identified the role and influence of the design brief on them at different stages of the design process. It looked at any input they had into design brief and what other factors influence the design brief. No mention of ecodesign or environmental labels at this stage to see if they would reveal that information voluntarily.

Design Aids: This section aimed to discover what types of resources the designers had experience of using. They were asked to rate the effectiveness and ease of use of different resource types, and comment on subjects these resources cover.

Forms of Environmentally Sensitive Design: A very brief section to discover their recognition and understanding of various terms such as ecodesign, sustainable design, etc., if their company follow any of these, and if they consider any of them through their work.

Design Process: Building on the ‘Your Job/Work’ section, they were asked at what stages of the design process do they consider economic, environmental and social factors.

Ecodesign Resources and Tools: Building on the ‘Design Aids’ section, they were asked to rate usefulness of various environmental design-focused resources and tools they had experience of using. They were then asked what content and/or features they would like from an aid focused on environmental design, if any.

Environmental Labels: This section began by focusing on the designers’ recognition and understanding of a range of environmental labels and schemes currently in use. They were asked which labels are applied to the product(s) they currently design, and if they considered anything about labels during the design process. The section went on to question who they thought benefited from environmental labels, and who could benefit from knowing about labelling criteria and guidelines. It finished by asking their thoughts and opinions on a design tool or resource aimed at ensuring products comply with specific
labelling schemes, and at what stage(s) of design process they would consider environmental labels if they knew more about them.

**Further involvement in study:** The questionnaire ended with an invitation for the respondent to be involved in subsequent data collection for the project. They could either leave a corresponding email address or contact the researcher directly via phone or email.

A pilot study was carried out to test the methods to be used in the Preliminary Study (questionnaire and semi-structured interview) in order to ascertain whether the questions would, as intended, contribute towards answering the research questions (Moore, 2006). The online survey was piloted with fellow researchers in Loughborough Design School. Feedback from this pilot led to amendments to the online survey. Images of label examples were also added to ensure respondents knew what they were being asked to comment on. Interviews were piloted with employees involved in the design process (including construction designers, graphic designers and marketing representatives) at a packaging company in Nottinghamshire, UK. They were chosen for the pilot because of a professional link with the researcher. Their design process was understood and anticipated to be a valuable place to pilot the study, as all design and marketing was conducted ‘in-house’. The participants were each given a paper version of the survey to complete in the presence of the researcher. The reasons behind this were: to allow the participants to enquire about any questions they did not understand; prevent conferring with colleagues or looking up answers on the internet; and it enabled the researcher to see which questions participants spent the longest time over. After each participant had completed the questionnaire, the researcher spent a few minutes before starting the interview reading their answers and making notes to personalise questions on the protocol sheet based on their responses. These individually tailored questions were designed to either explain an answer given or to uncover the reasoning behind a particular response. At the end of the interview each participant was asked for their feedback on the content, language and structure used in the survey and interview.
The survey was constructed online using Bristol Online Survey (BOS) software. Advantages of an online survey over postal paper copies include ease of distribution, increased opportunities to advertise the survey, a better chance of completion by designers in their workplace in a short time frame (compared to individual interviewing), low cost, and the instant receipt of completed questionnaires (Moore, 2006; Robson, 1993, 2002). The survey included various features to encourage the participant to continue. These included having a ‘progress’ bar and display page numbers, allowing participants the opportunity to save and resume the questionnaire at a later date, and importantly telling prospective participants at the beginning how long they will have to spend filling it in (Moore, 2006). All surveys were conducted anonymously, that is, respondents were not asked their name or the name of their company in an attempt to encourage both participation and more honest responses (Thomas, 2009). Further details regarding the reliability of the data gathered in this study is discussed later in this chapter section 3.5.

The first online survey was launched in April 2009, with a simplified, shortened version replacing it in August 2009. When the surveys closed in September 2009, there were 50 completed responses: 30 suitable completed responses for the first and 14 suitable completed responses for the second (suitable as they satisfied the inclusion criteria), a total of 44. Respondents were not asked for the name of the company they worked for (to avoid breaching anonymity), although there were up to 43 companies represented (two respondents, who were later interviewed, came from the same company). Six surveys were excluded as unsuitable due to the respondents not being UK SME designers and 41 incomplete surveys were also excluded. The aim had been to have between 50 and 100 respondents but having received only 30 suitable completed surveys after four months, the first survey was reviewed to consider factors that might be discouraging participation (Moore, 2006). As a result the shortened version (second survey) was created to address a concern regarding the length of the survey. The initial survey informed respondents at the start that it would take 20 minutes to complete. By shortening the survey to 10 minutes it was anticipated that respondents may be more willing to complete the survey. To shorten it, the replacement survey focused on the key details; additionally
from early analysis of the first survey it was decided that some questions were not obtaining useful data. The new version of the survey also replaced some free text answer boxes with a list of the most common or likely responses (as found in the existing completed surveys), plus an option to type in a free text box. However despite the changes the second survey also encountered a low response rate, achieving 14 completed responses.

The data from the completed online surveys were complied and analysed, using a combination of the Bristol Online Survey (BOS) analytical software and manually using Microsoft Excel; analysis procedures are described in depth later in this chapter. The processed data were used to identify trends, draw initial conclusions and help form questions to be used in planned follow-up semi-structured interviews with designers.

3.5.1.2 Interviews

Online surveys provide a broad picture but by their nature, results tend to be superficial. Moore (2006, p.120) considers that ‘people tend to fill them in quickly, giving an immediate rather than a considered response’, thus advising survey use to build up a broad picture that can then be followed up. This was addressed by use of in-depth interviews to provide a more detailed picture of the key issues.

Rugg and Petre (2007, p.65) state that:

‘Surveys can produce some interesting findings, but as usual, these will just produce more questions, such as ‘why do they do that?’ or ‘could we educate them so they don’t do that anymore?’

This leads us out of surveys and into other designs.’

The intended outcomes from the interviews were to find: further detail about designers’ knowledge and experience of environmental issues and environmental labels; more depth specifically about environmental issues and environmental labelling in the Design Brief; what influence if any they have on
the designer during the Design Process; how well designers understand the
colors of ecodesign they claimed in the surveys; and specific and
personalised requirements the designers had for information on environmental
labelling to assist them through a resource, including content and how it could
be delivered.

The interviews were semi-structured to give the flexibility to change the order of
questions to follow the flow of the conversation, ask additional questions for
clarification or further explanation to answers given (Silverman, 2004; Thomas
2009). This enabled the flow of natural conversation from one issue to another
and revealed the associations the participants made between issues which did
not necessarily follow those of the researcher. At the same time, the interviews
retained some elements of structure and the protocol served as a reminder to
cover certain topics. This allowed for comparisons to be made between
interviews. It was anticipated that a conversational approach would also help to
put the designers at ease and be more open; interviews opened with a brief
informal conversation and interviewees were able to ask the interviewer any
questions they had (Kvale, 2007).

It was considered best to conduct the interviews face-to-face at the designers’
place of work:

‘A great deal is provided by this personal contact … and
interviewees will respond to you, in bodily presence, in an entirely
different way’ (Thomas 2009, p. 160).

It was anticipated that the familiar environment of the designers’ workplace
would help put them at ease and help to reinforce the fact that they were being
interviewed as designers rather than consumers. The interviewees were also
able to use the setting to see and refer to visual reminders of their design
process such as books or favourites on their web browser. Interviews were
audio recorded to allow the conversation to run smoothly and the recordings
transcribed verbatim. Notes made by the interviewer during the conversation
were also recorded on the transcript.
3.5.1.3 Sampling for Preliminary Study

Recruitment at this stage targeted UK industrial designers who were currently or had previous experience of working within an SME. Name of company or type of product(s) designed were not asked on the survey. The online survey was uploaded and advertised in online social networking groups for designers on LinkedIn, Knowledge Transfer Network groups and Facebook, and was forwarded by email to 30 designers already in the researcher’s professional network. Social media sites were used to target respondents because they are recognised as crucial locations for reaching populations beyond researchers’ traditional professional networks, both for recruitment and data collection (Hill, Dean and Murphy, 2014). Increasingly social media are sites for mass participation and places for community and connection, both socially and professionally (Song, 2008).

When the surveys closed in September 2009, there were 50 completed responses: 30 suitable completed responses for the first survey and 14 suitable completed responses for the second, a total of 44 from active industrial designers in UK SMEs. Six surveys were excluded as unsuitable due to the respondents not being UK SME designers and 41 incomplete surveys were also excluded. Of these 44, 17 were invited for follow-up interview as they had indicated willingness to be involved in further research activity. Six designers (all at different companies) responded to the invite and further snowball sampling was implemented with these six participants suggesting suitable colleagues willing to be interviewed. This resulted in another 15 designer-interviewees. The remaining four designers (in Company G) were in the researcher’s professional network and took up the invitation to participate at this stage, although they had not responded to the online survey invitation. This resulted in a total of 25 interviewees for the Preliminary Study.

3.5.2 Development of the prototype resource ‘DELR’
The Preliminary Study suggested that further data collection was needed to investigate deeper designers’ reported need for greater knowledge of environmental labels. This would help to answer the research questions and to further develop an understanding of designers’ relationships with environmental labels. This was an opportunity to identify the various requirements designers indicated and their desire to know about environmental labels (as will be seen in the conclusions of Chapter 4). Based on these findings, a mock-up resource was developed following the Preliminary Study, in line with the emergent approach to the research project, to offer further exploratory data to answer research questions 2 to 6. The intention of the Resource was assist the Main Study to build upon the Preliminary Study rather than repeat any aspects of it.

The Resource was used as a data elicitation tool in that designers could talk about the content (information) and what they would be able to do with the content. It was also used in the observation and the task analysis so data was obtained with designers that would not have been possible with a verbal interview only. This enabled noting of which features or type of information the designers accessed when using the Resource, as opposed to them only talking in interview about what they might want. It also allowed for a discussion to prompt further conversation around labels, designers’ role and influence, beyond the semi-structured interview schedule. Elicitation tools are valuable in this regard for enabling interviewees to lead the conversation. As the study went on to show, the main issue was not access to knowledge but designers’ ability to use knowledge and implement labels based on their position or role. There could have been no probing of this issue without providing the resource and asking designers how they might utilise it.

The Resource was created as a prototype. Allan et al (1999) said that prototypes work better than finished versions because ‘if a prototype is too finished, it actually stops people from commenting. If it is that finished, they think, then it’s no longer under development’ (p.118). The resource produced was a working prototype primarily developed as a mechanism for collecting data (Tracy, 2013). Tracy says that elicitation in interviews can use pictures, videos, text or an object in order to prompt discussion. These objects can serve to drive
the interview in certain directions or understand how an interviewee uses an object or text. She goes on to suggest that ‘through the embodied process of playing with visual materials, participants may provide a more realistic response than the one collected through words only’ (p.149-150) and with this reasoning, using the resource formed a part of the interviews for the Main Study, as will be seen in the following section. The development of the resource is outlined in chapter 5.

3.5.3 Main Study

Having developed a prototype resource, the Main Study was designed to continue the data collection from the Preliminary Study with further depth, by using the resource as an elicitation tool. Again a multiple method design was applied to this study; interviews were combined with task analysis and observation to gain further insight into designers’ knowledge and factors affecting their implementation of environmental labels. This was followed by an anonymous survey questionnaire seeking feedback based on the prototype resource.

The Main study was conducted face-to-face with designers at their place of work. The prototype resource was presented to each participant on the researcher’s personal laptop. The decision to do this, as opposed to the participant accessing it online, included control over the consistent appearance of ‘DELR’, maintaining the sense of it being a prototype, and mitigating the risk of technical issues such as company firewalls or loss of internet connectivity.

Task analysis and observation were combined in order to elicit how designers used and valued the knowledge that the resource provided on environmental labels (Tracy, 2013). Task analysis has long been an acceptable method used for designing and testing software interfaces (Rugg and Petre, 2007). Participants were asked to carry out a number of predefined tasks using ‘DELR’. Each task was based on a feature of ‘DELR’ to find out if they were an
adequate interpretation of what was required. The designer chose the order of the features they accessed whilst imagining they were designing a product, any features not visited were viewed as a separate task at the end of the test. Tasks included “find information about a specific label” and “find which label(s) are applicable to a product they currently design”. Direct observation was used in the task analysis. Much can be inferred from observation, such as how easy a participant finds a task to complete whilst focusing on the task or talking the researcher through it (Rugg and Petre, 2007). This can be useful for working out what a designer really does often or rarely, ‘as opposed to what they claim they do,’ in a survey or interview trying to recall past experience (Rugg and Petre, 2007, p.110).

As well as avoiding the need for recall, as Robson (2002, p.310) says, ‘a major advantage of observation as a technique is its directness. You do not ask people about their views, feelings or attitudes; you watch what they do and listen to what they say’. The designers’ reactions to ‘DELR’ could be seen in the moment. The participants’ progress through the resource, for instance the time they take to read, select information and click through to another page, could be recorded. This was done through audio recording the task as well as researcher’s written notes on the observation. Participants were informed that the researcher planned to make some notes throughout the task.

Semi-structured interviews were conducted alongside the observation of the task analysis. As with the Preliminary Study, all interviews were recorded and transcribed. Questions concerned each feature of ‘DELR’ and participants were also asked their thoughts on the overall resource what would motivate them to use ‘DELR’. (See Appendix vi for Main Study interview question prompt sheet and Appendix viii for sample transcript).

The final stage of data collection in the Main study was a ‘self-completion’ questionnaire. Questionnaires are a commonly used way of ‘collecting information about the subjective features in a standardised format’ (Rugg and Petre, 2007, p.144). All participants involved in the testing of the prototype resource were invited to complete this brief feedback online away from the
researcher. It was anticipated that this would encourage more honest responses from the designers (Moore 2006) as they were not obligated to complete the questionnaire and the researcher could not see immediately how they were responding. Designers were identified by a participant ID (e.g. 1A), enabling the results of the survey to be triangulated with the responses from both the task analysis observation and interview.

The participants were asked to complete the feedback survey after completing the test and away from the researcher in case his presence had an impact on their responses and the reliability of the data. The accuracy of the results was considered to be of paramount importance even though it was at the expense of a lower completion rate of 11 out of 16. The content of the questionnaire was similar to that of the interviews to allow for direct comparison between what was said in interview and in the feedback survey to be made. Screen shot images of ‘DELR’ were included to act as visual reminders. The questions were grouped in the following categories: Prototype Resource Features; Prototype Resource Overall; and “Prototype Resource and You”.

3.5.3.1 Piloting of Main study methods

The piloting of the methods for the Main Study was in two parts as with the piloting of the Preliminary Study methods. The first involved two researchers in the Design School at Loughborough University who had experience of setting up and conducting trials. Firstly the prototype resource was introduced and the pre-planned tasks run through to check they were suitable and understandable. At the same time the researcher made observations. From this, codes were developed. The script for the semi-structured interview was also read through. The volunteers were then encouraged to use the resources in any way they wanted and were asked to highlight any errors, broken or out-dated links.

The second part piloted the methods using four final year Industrial Design undergraduate students, each with at least one year of experience working in industry (gained on a placement year in industry). The pre-planned task
analysis and observation with simultaneous semi-structured interview was run through, where participants could choose the order of features they used. Each was recorded for transcription later and notes of the observation and interview made.

3.5.3.2 Sampling for Main Study

The 25 designers who had taken part in the Preliminary Study follow-up interviews had all indicated willingness to take part in further research and were invited via email or telephone to participate in the Main Study. Unfortunately only four of the Preliminary Study interviewees took up the Main Study invite. There were 19 who were not contactable (due to job moves) and the remaining two declined to participate further. To address this disappointing response further snowball recruitment requested participants to suggest suitable design colleagues within their company who may have been interested in participating. This recruited an additional three participants. In order to reach new designers, details about the project and plans for the Main Study were advertised on LinkedIn, Knowledge Transfer Network groups and Facebook groups following the same recruitment policy as the Preliminary Study, that is, specifically targeting in-house industrial designers in UK SMEs. This was to gain fresh perspectives in testing DELR to check that it was representative of or relevant to other designers, not just the Preliminary Study participants. There were a total of 16 designers from nine companies in the Main Study, as indicated in Tables 3.3 and 3.4. One of the nine companies employing these designer-participants was a design consultancy rather than a company with in-house designers, however all four of these designer-participants had previously worked as in-house designers in UK SMEs and due to the disappointing responses these were included.

3.5.4 Case Studies
After the Preliminary and Main Studies, it appeared that many designers have a desire to use environmental labels but claim to lack knowledge of them (as will be shown in chapters 4, 5 and 6). It left questions about the knowledge and decision making of companies who do use environmental labels. Turning from the previous exploratory design, a descriptive case study approach was selected in order to ask again about factors affecting implementation of environmental labels, but this time directed at designers within companies who have successfully applied environmental label(s) to a product(s). An example of a case study method working with designers in UK SMEs is O’Connor and Cox (2005), who said case studies can involve ‘semi-structured interviews with the principals […] brochures, websites, the authors’ personal experiences and reviewing the organizations’ product ranges’ (p.73).

3.5.4.1 Sampling for Case Studies

A purposive sampling strategy was used. To facilitate identification of eligible cases (the criterion being UK SMEs with in-house designers currently applying environmental labels to their products), companies applying the FSC label to their products were targeted for recruitment. This was because the FSC label is trusted and valued by consumers (as noted in the Introduction) and the FSC published a list of all products that have been awarded the label. From this list, 12 UK SMEs were identified and contacted with an invitation to participate. Two companies took up the invite. They had not previously been involved in the research.

Additionally, one of the companies whose designers were involved in the Preliminary and Main Studies presented a fruitful case for further investigation as it arose that their company had experience of applying an environmental label to a product. These three companies (see Table 3.5 below) form the material for the Case Study Chapter 7.

<table>
<thead>
<tr>
<th>Company</th>
<th>Market / Industrial Sector</th>
<th>Main Products / Services</th>
<th>Market Served</th>
<th>Size (Approx.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company A</td>
<td>Outdoor &amp; camping products</td>
<td>Rucksacks, tents, drinks bottles, personal GPS systems, etc.</td>
<td>B2C, B2B</td>
<td>40</td>
</tr>
<tr>
<td>Company P</td>
<td>Casket industry</td>
<td>Coffins, caskets, urns, tree</td>
<td>B2C</td>
<td>100</td>
</tr>
<tr>
<td>Company Q</td>
<td>Toys</td>
<td>Educational toys, board games, puzzles</td>
<td>B2C, B2B</td>
<td>6</td>
</tr>
<tr>
<td>-----------</td>
<td>------</td>
<td>----------------------------------------</td>
<td>----------</td>
<td>---</td>
</tr>
</tbody>
</table>

B2C = Business to Consumer, B2B = Business to Business

**Table 3.5 Details of companies involved in the Case Study chapter**

The case studies were constructed from various interviews with industrial / product designers, sales and marketing practitioners, and graphic designers (details of interviewees can be seen in Table 3.6); company websites; online catalogues; websites of environmental label awarding bodies / organisations; and social network sites. These elements combined to build a rich picture of each company. The semi-structured interview schedule can be found in Appendix ix, although each was tailored specifically to the company based on information gained through the methods outlined above.
### Table 3.6 Details of interviewees involved in the Case Study chapter

<table>
<thead>
<tr>
<th>Company</th>
<th>Interviewee</th>
<th>Job Title</th>
<th>Design experience</th>
<th>University attended</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company A</td>
<td>1A</td>
<td>Product Designer</td>
<td>5 years</td>
<td>Loughborough University</td>
</tr>
<tr>
<td>Company A</td>
<td>4A</td>
<td>Product Designer</td>
<td>8 years</td>
<td>Brunel University</td>
</tr>
<tr>
<td>Company A</td>
<td>5A</td>
<td>Sales / Marketing</td>
<td>N/A</td>
<td>Oxford Brookes University</td>
</tr>
<tr>
<td>Company A</td>
<td>6A</td>
<td>Graphic Designer</td>
<td>4 Years</td>
<td>University of Huddersfield</td>
</tr>
<tr>
<td>Company P</td>
<td>1P</td>
<td>Creative Designer (product)</td>
<td>9 Years</td>
<td>London Metropolitan</td>
</tr>
<tr>
<td>Company P</td>
<td>2P</td>
<td>Creative Designer (product &amp; graphics)</td>
<td>3 Years</td>
<td>Bournemouth University</td>
</tr>
<tr>
<td>Company P</td>
<td>3P</td>
<td>Sales and Marketing Manager</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Company Q</td>
<td>1Q</td>
<td>Quality Assurance Manager and Product Designer</td>
<td>18 Years</td>
<td>Keele University</td>
</tr>
<tr>
<td>Company Q</td>
<td>2Q</td>
<td>Head of Product Development</td>
<td>20 Years</td>
<td>N/A</td>
</tr>
<tr>
<td>Company Q</td>
<td>3Q</td>
<td>Marketing Manager</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

#### 3.6 Ethical considerations

University procedures on research with human participants were followed. In research with human participants preparations must be made to abide by ethical practices. Following Robson (1993), these include informed consent, voluntary involvement, privacy, respect and equal treatment. Anonymity and confidentiality have been ensured for both designers and the companies they work for; this was crucial as many shared details of their design practices and strategies that they would not want competitors or consumers to know. Some were concerned that if potentially they had inadvertently done something wrong or illegal that it would result in negative publicity. If something had gone well, they were also reluctant to divulge details to their competitors. They felt this was especially important given that they were SMEs.

#### 3.7 Data analysis
Robson (2007) stresses the importance of dealing with qualitative data effectively by reduction and organisation techniques in order to make it more manageable. Qualitative data obtained in this study has been analysed predominantly using a coding and clustering method (Gibson and Brown, 2009). The aim is to ‘distil data, sort them’, and provide a way to make comparisons (Charmaz, 2006, p.3). Analysis was carried out after each study. This was an iterative process between literature and designers’ data to review how the data offered responses to the research questions.

Quantitative data from both surveys were downloaded into Microsoft Excel which enabled all responses to each question to be displayed together. The responses were colour coded into groups. Additionally, the data from the Main Study feedback survey were also analysed using the statistical analytical features built into the Bristol Online Survey (BOS) software. For instance, the software was able to rank responses, show most common or mean response. Triangulating these responses with interview responses and observation notes enabled a richer picture. Where discrepancies arose between a respondent’s interview and survey answers, this will be addressed in the Discussion chapter.

Research observation notes, interviews and free text survey responses were all coded. Transcripts were read through and inductive coding carried out. Subsequently these codes were reviewed and clustered or categorised (see Figure 3.2 for a sample). Constant comparison method was used; codes collated during the Preliminary Study were refined and developed at later stages as new data offered further insight. Other in vivo or inductive codes were also noted throughout. Once complete, codes were reviewed and clustered into themes relating to research questions (Robson, 2007; Richards, 2009). Word files were created for each cluster and segments of open responses were pasted in. Appendix x shows an example of the cut and paste method. The clusters were reviewed for how they fitted the themes deductively in relation to the research questions. Multiple rounds of reading, reviewing and memoing (Richards, 2009) created the results chapters to follow.
Environmental Labels

<table>
<thead>
<tr>
<th>Environmental Labels</th>
<th>LAB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opinions</td>
<td>LAB – OPS</td>
</tr>
<tr>
<td>Positive</td>
<td>LAB – OPS – POS</td>
</tr>
<tr>
<td>Negative</td>
<td>LAB – OPS – NEG</td>
</tr>
<tr>
<td>Neutral</td>
<td>LAB – OPS – NEU</td>
</tr>
<tr>
<td>Knowledge</td>
<td>LAB – KNO</td>
</tr>
<tr>
<td>Current</td>
<td>LAB – KNO – CUR</td>
</tr>
<tr>
<td>Required</td>
<td>LAB – KNO – REQ</td>
</tr>
<tr>
<td>Desired</td>
<td>LAB – KNO – DES</td>
</tr>
<tr>
<td>Improve product</td>
<td>LAB – KNO – PRO</td>
</tr>
<tr>
<td>Improve experience</td>
<td>LAB – KNO – EXP</td>
</tr>
<tr>
<td>Experience</td>
<td>LAB – EXP</td>
</tr>
<tr>
<td>Using</td>
<td>LAB – EXP – USE</td>
</tr>
<tr>
<td>Applying</td>
<td>LAB – EXP – APP</td>
</tr>
<tr>
<td>Cost</td>
<td>LAB – COS</td>
</tr>
</tbody>
</table>

Figure 3.2 Sample of coding and clustering

3.8 Validity and Reliability

In all research, the impact and worth of the findings and conclusions depend on the extent to which the data collection has captured some level of “truth” about the aspect of the real world that is under investigation. In quantitative, experimental approaches, the generally accepted notions of reliability and validity of a project refer, respectively, to the extent to which an experiment can be repeated and achieve the same results; and does a study measure what it set out to measure (Patton, 2002). As this project takes up a largely qualitative framework, there is a particular type of “truth” that can be achieved and the concepts validity and reliability have different meanings. Lincoln and Guba’s four concepts of credibility, dependability and transferability have replaced the traditional quantitative concepts of validity, reliability and generalisability respectively.

In terms of reliability, interpretive research does not claim to be exactly repeatable. On a different day the participants may have had a different product
or design brief in mind and provided different answers based on these reflections; and indeed the position and effect of the researcher in the project should not necessarily be seen as a limitation but as something that contributes to the nuance and complexity of a project in the social world (Patton, 2002). Lincoln and Guba’s (1985) redefinition of validity into credibility in qualitative projects prompts consideration of the trust that can be placed in the data. Do the data sound credible? The least trustworthy data could be the quantitative element, the online survey. Respondents’ claim to be industrial designers in UK SMEs was taken at face value; being both anonymous and filled out online, away from the researcher, respondents could have claimed to be designers even if they were not. This cannot be ascertained. However, in all the later data collection stages, in interview settings, all participants were known and so it could be confirmed that they did work as industrial designers in UK SMEs. Answers could be probed and expanded upon, confirming that they were being truthful about their knowledge and use of environmental labels.

Research that tests or checks knowledge has a potential for a learning effect from one stage to the next, where a research participant gains knowledge or understanding of a subject that they did not have prior to the research, which then may have an influence on subsequent testing. Six designers who were involved in more than one stage of the project had a potential learning effect in terms of label recognition (see table 3.2). If present, this would have affected survey respondents (as the survey enquired into label recognition) who were involved in Preliminary Study and/or Main Study interviews. Any learning effects from individuals involved in previous studies were considered minimal as each was designed to obtain different information. The Preliminary Study survey gathered data primarily on label recognition; however the Preliminary Study interviews were aimed at investigating designers’ understanding of labels, labelling processes and previous experience; the Main Study focused on designers’ position and influence within companies, and what knowledge of labels would enable them to do (not their level of knowledge); finally, the Case Studies investigated the designers’ role and historical experience of designing a product that had an environmental label applied to it. However, this also allowed
the opportunity for clarification of responses to the Preliminary Study from these six designers in the Main Study.

Thomas (2009) invites us to think about the researcher’s ‘positionality’ in relation to the research field and the participants. By this, Thomas means, ‘you are interpreting on the basis of you being you, interviewing someone else being them’ (Thomas, 2009, p.106). As an active agent in the research, especially where interviews and observations are carried out, the researcher’s biography as well as the ways in which he forms relationships with the participants should be acknowledged, even while measures to allay the effects would be unnecessary (Thomas, 2009). This is repeated by Richards (2009) who says it is ‘important to reflect on the ways in which you enter and effect a situation, and create and use ‘data’ from that situation’ (Richards, 2009, p.21). Having studied and taught Design and Technology, the researcher has an understanding of the importance of the role of designers in the design process from theoretical and practical positions. Despite an interest in the environment, he does not “wear green-tinted spectacles”. Motivations to study environmental labels included gaining an understanding of why they are not used more frequently by designers, but it was not to force designers to use them more. Reflection on the complex and personal drivers of the project and the researcher’s history was retained throughout the data collection and analysis processes.

The researcher made all participants aware of his background as a trained industrial designer. It was anticipated this would help to establish a common understanding so they would feel more willing to provide detailed responses about their work as designers. The researcher had existing relationships with four participants, who were Industrial Design graduates from Loughborough University. These participants were considered invaluable to the study as they provided a gateway into several companies. These participants were also believed to have given some of the most honest responses and feedback as they understood the accuracy of their answers was important.
3.9 Summary

This chapter has outlined the procedures and rationales for the research design used in the empirical aspects of this study. This project used an emergent design combining exploratory survey and descriptive case study design frames where each of three stages of data collection informed the next. A Preliminary Study consisting of an online questionnaire and follow-up interview aimed to establish designers’ knowledge and experiences of environmental labels through their work. The findings suggested that designers felt they could benefit from knowing information about the various environmental labels and schemes currently in use within the UK. A mock-up of an online resource for designers with various features about environmental labels was developed. This prototype resource (‘DELR’) was then tested through a task analysis and observation whilst simultaneously acting as a data elicitation tool for interviews in the Main Study. Following this, participants were invited to complete an anonymous feedback survey. Case Studies were subsequently created to provide further insight into companies who have successfully applied environmental labels to their product(s). The next chapter presents the themes that emerged from the Preliminary Study, with these findings enabling the introduction of the prototype resource in Chapter 5.
4 PRELIMINARY STUDY

The Literature Review concluded that designers have a role to play in ecodesign and in the implementation of environmental labels by a company. This role may be heightened in SMEs, where designers can often fulfil multiple roles, such as being involved in the marketing of products. Despite this, little research on designers’ knowledge of labels has been conducted compared with the knowledge that has been gained on consumers. Designers’ propensity to use labels, and how labels might affect their work, is one focus of this study. As outlined in Chapter 3, an exploratory study (the Preliminary Study) was designed combining online surveys (n = 44, in <44 SMEs) and follow-up interviews with a number of in-house industrial designers in the UK (n = 25, in seven SMEs) (See Tables 4.1 and 4.2). This chapter presents the interpreted results in line with the research questions, addressing in turn the place of labels in the design brief; the influence of labels on designers’ work; other factors affecting implementation of labels; designers’ existing knowledge of labels; and their requests for further knowledge.
<table>
<thead>
<tr>
<th>Company</th>
<th>Participant (*) if not industrial designer</th>
<th>Preliminary Study</th>
<th>Main Study</th>
<th>Case Studies</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Survey (ID)</td>
<td>Interview</td>
<td>Interview</td>
<td>Feedback Survey</td>
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<tr>
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<td>1A</td>
<td>Yes (Part26)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Company A</td>
<td>2A</td>
<td>Yes (Part27)</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Company A</td>
<td>3A</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Company B</td>
<td>1B</td>
<td>Yes (Part36)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Company B</td>
<td>2B</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Company B</td>
<td>3B</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Company C</td>
<td>1C</td>
<td>Yes (Part39)</td>
<td>Yes</td>
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<td>2C</td>
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<td>Yes</td>
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<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Company C</td>
<td>4C</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
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<td>Company D</td>
<td>1D</td>
<td>Yes (Part22)</td>
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<td>Company E</td>
<td>1E</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
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<td>Company F</td>
<td>1F</td>
<td>Yes (Part30)</td>
<td>Yes</td>
<td>No</td>
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<tr>
<td>Company F</td>
<td>2F</td>
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<td>Yes</td>
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<td>3F</td>
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<td>Company F</td>
<td>4F</td>
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<td>Yes</td>
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<td>No</td>
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<td>7F</td>
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</tr>
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<td>No</td>
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<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Company G</td>
<td>2G</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Company G</td>
<td>3G</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Company G</td>
<td>4G</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

Table 4.1 Designers interviewed during the Preliminary Study

<table>
<thead>
<tr>
<th>Company</th>
<th>Market / Industrial Sector</th>
<th>Main Products</th>
<th>Market Served</th>
<th>Size (approx.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company A</td>
<td>Outdoor &amp; camping products</td>
<td>Rucksacks, Tents, Drinks bottles, personal GPS systems, etc.</td>
<td>B2C, B2B</td>
<td>40</td>
</tr>
<tr>
<td>Company E</td>
<td>Furniture</td>
<td>Chairs, Tables</td>
<td>B2C</td>
<td>25</td>
</tr>
<tr>
<td>Company F</td>
<td>Domestic Kitchen products &amp; utensils</td>
<td>Electronic products (e.g. choppers), Utensils (e.g. folding grater)</td>
<td>B2C</td>
<td>75</td>
</tr>
<tr>
<td>Company G</td>
<td>Stationary, Packaging, POS</td>
<td>Self-assembly storage, files, boxes, POS displays, etc.</td>
<td>B2B, B2C</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 4.2 UK SMEs involved in the Preliminary Study
4.1 The Place of Labels in the Design Brief

For the survey respondents, it is clear that the design brief has a significant impact on both their work and the designs they produce (Figure 4.1). However, very few of them are always involved in the writing of the design brief.

![Figure 4.1 How often are designers involved in a) writing the design brief and b) responding to the design brief (n=44)](image)

There was a clear correlation between what designers perceived as their input into the setting of the design brief and their influence on the product through the Design Process; that is, the greater input they had on the design brief, the greater influence they had on the Design Process. 30 respondents of 44 said they as a designer, or other designers in their company, had involvement in the production of the design brief. However, only seven said they were always involved. This data is shown in Table 4.1 for the respondents who said they always or occasionally were involved in writing the design brief. They ranged from being the most influential professional to having little or no control over the product outcome. Knowing the relationships between designers and design briefs helps to contextualise the findings to follow.
The results from both the questionnaires and interviews indicate that environmental issues are rarely raised in the design brief for these designers. A number of designers commented that they have noticed that in recent years concerns for the environment from customers have dropped steadily alongside the decline in the global economy. All appeared to understand and accept that their customers wanted “value for money” as they have profit margins and budgets to meet. Companies’ need for profit to survive and thrive was also clear. There was a strong sense that considering environmental issues, at least in the eyes of customers, was seen as an additional cost and time consuming.
When environmental issues are specified within the design brief, they tend to be for product or company marketing purposes. For example, with the packaging that companies use for their products, decisions can be easily made to make their designs more environmentally sensitive. 4G gave the example of this from their own work:

‘Using carton board is better than petroleum-based plastic for the environment, and that there are a number of “environmentally-friendly” types of carton board available such as FSC certified, x% recycled content board, and recycled foil-backed board’ (4G).

Many interviewees cited that the extent of flexibility or “openness” in the design brief has a significant influence on what the designers felt they were able to do in terms of personal design decisions. The more tight or closed the brief, the more they felt that they were being prescribed what to design rather than making design decisions themselves, to the point where briefs are effectively telling the designer exactly what design decisions they should make and/or what the outcome should be:

‘…although it’s a very narrow brief […] the size, the shape, the colour, and so on is still up for debate […] The reason for that is the management needs to know that there is going to be an outcome at the end of it.[…] they know that after six months we will have a product that they can sell.’ (1A)

More open design briefs were seen as risky:

‘Because the more open the brief, the higher the risk of not delivering it on time or on budget and so on.’ (1A)

Another issue is when a brief contains insufficient detail for designers to act upon. For example, 3B said that technically there should be a product design specification (PDS), but briefs they work to are often insufficiently detailed. While risky for the company or client, this may be where designers have some scope for thinking and acting more creatively or more in-line with ecodesign values. From the interviews, two pressures can be seen to dominate the design decisions made throughout the Design Process: costs and time. Costs include
those of manufacture and materials; the investment required to develop; the
upfront costs and product profit margins. Time concerns included from the
design of the product to launch into the marketplace. The longer this whole
process takes, the higher the risks (such as release of rival products).

When asked at what stage(s) of the PDP they would consider environmental
labelling, one respondent answered ‘things like this have to be considered from
the start. The company has to be on it as the individual is virtually powerless to
change a company due to existing systems and hierarchies in place’ (8F). The
overall view from the interviews was that environmental labels may influence
several stages of the PDP such as materials selection and marketing of the
finished product. This influence can even occur before the PDP starts by
attracting the initial business, as suggested by 1G, who said that an increasing
number of companies are specifying that they want to use sustainably sourced
material to ‘reflect well with customers’. 2C explained that as well as their
company’s own in-house standards they now follow ISO14001 guidelines as
well. ISO14001 ‘sets out how you can go about putting in place an effective
Environmental Management System (EMS). The standard is designed to
address the delicate balance between maintaining profitability and reducing
environmental impact’ (International Standards Office, 2010). 2C spoke about
how appearing to be environmentally sensitive benefitted companies by
increasing the potential for tendered work, especially from the government, by
complying with ISO14001:

‘Well it’s a cynical way of getting more business because a lot of
tenders, certainly government organisations that tender out work,
they will fast-track you in if you’re seen to be environmentally
friendly, if you have certain ISOs and stuff, you will be shortlisted
for certain work to the extent that if you haven’t got it [ISO
compliance] you won’t get it [the work being tendered]. So it’s not
because everyone wants to save the planet it’s because they want
a bit more money.’ (2C)

There was evidence that environmental labels can and do appear in the design
brief for a number of reasons. Firstly, those compulsory labels related to
legislation and standards that must be applied to products such as the Waste Electronic and Electrical Equipment (WEEE) Directive logo were regularly cited by participants. For example from the survey, ‘mainly from a compliance perspective and as a company most eco-decisions are more heavily weighted on the Economic perspective. WEEE and RoHS is important to us. As is recycled packaging.’ (Part11) and ‘sometimes - to comply with standards’ (Part36). Those labels which are required for the market they are to be sold in, such as the Green Dot, were also mentioned a number of times. Labels were also mentioned as specified by the marketing practitioners within the designers’ company. Environmental labels also appear in the design brief when they have been specifically requested by the client. In their opinion, 4G explained, they believe the reason for this is that clients see environmental labelling as a marketing tool which forms part of their corporate image that they wish to uphold. However, several designers said that they have recently experienced a drop in the number of customers and companies who specify environmental criteria in the design brief.

4.2 Effect of Labels on Designers’ Work Currently

Just over half of the respondents agreed that at least some ecodesign principles affect their work. This most commonly took the form of maximising the use of resources (i.e. materials) to reduce waste and to be more economical. 21 survey respondents said that environmental factors are considered when choosing materials; 10 said that environmental factors are considered while writing the design brief. This offers some overall context for considering the influence of labels.

Survey 1 asked three questions concerning the benefits of labels and knowing more about labels (In Survey 2 these questions were removed as part of making the survey shorter, with a greater focus on what designer-respondents knew about labels). Firstly, respondents were asked about who they think benefits from environmental label schemes; secondly, who they think benefits from knowing about the criteria required for labels; finally, who would benefit
Few felt that they as designers, or other designers, would benefit from labels per se, but many thought that they would benefit from knowing the criteria or having guidelines. High numbers also felt that their company would benefit. Just over half (16) felt that labels would benefit the product, but this drops to around a third who thought that knowing about the criteria for labels, or having guidelines, would benefit the product.

12 survey respondents identified the labels that they currently use on their products (see Figure 4.2). Although some environmental labels such as the Universal Recycling Symbol appear on the products that most survey respondents design, only four said that they currently use them to aid their design decision making. For those who did, this was mainly due to compliance. These labels which require compliance have a direct influence on these designers’ work; however this was sometimes expressed simply as remembering to place the logo on the product. The rest claimed not to use any labels currently.

<table>
<thead>
<tr>
<th></th>
<th>Benefit from labels</th>
<th>Benefit from knowing criteria required for labels</th>
<th>Benefit from guidelines advising ways to design with labels in mind</th>
</tr>
</thead>
<tbody>
<tr>
<td>You as a designer</td>
<td>10</td>
<td>23</td>
<td>24</td>
</tr>
<tr>
<td>Other designers</td>
<td>7</td>
<td>22</td>
<td>23</td>
</tr>
<tr>
<td>Your company</td>
<td>19</td>
<td>18</td>
<td>23</td>
</tr>
<tr>
<td>Consumers</td>
<td>23</td>
<td>23</td>
<td>11</td>
</tr>
<tr>
<td>The product/service</td>
<td>16</td>
<td>9</td>
<td>11</td>
</tr>
</tbody>
</table>

Table 4.4 Results from three questions on the benefits of labels, asked to respondents of Survey 1 (n=30)
At other times, time and resources were factored in for requirements to send products out for external testing for the EU Energy Label. Some designers (1B and 2B from Company B) cited waiting times up to six months for new products to return from test houses. There were a number of negative opinions initially expressed towards environmental labelling by the interviewees. Some said they felt wary of using any environmental labels on their products for fear that it could make them look bad if they did not match the performance of their competitors. For voluntary schemes to be successful 1A said:

'I would suggest that kind of approach would only be adopted by the majority of manufacturers if everybody were to do it or for it to become a legislative thing where you are forced to do it' (1A).

2C revealed that they feel ‘quite cynical about the whole thing so it’s kind of like a pat on the head.’ However they then went onto say ‘I guess it’s worth having if you’re a company and other people recognise it then yeah I guess it’s a good thing, but it’s like any other reward isn’t it’ (2C).

Some of the designers looked to the positives once they had a period to think about how knowing about labelling schemes could benefit themselves and their
company. For example, both 3B and 8F stated that it would be a positive thing for their company to be seen as environmentally sensitive; this specifically arose in relation to recycled and recyclable packaging and the development of public perception of a company. Designer 2A talked about the satisfaction they would feel if their company were to employ a recycling “take-back” strategy with related labels on the products they design:

‘Some companies [in their industry sector] are doing product recycling schemes where you bring back your old [products] and they recycle it. So some people […] are doing it and I would like us to do that too and if we did do that yeah it would enhance my whole kind of warm fuzzy feeling about doing a decent job, not just creating tat for people to bin’ (2A).

These examples suggest a positive attitude held by these designers towards the idea of their company’s acting in an environmentally sensitive manner. These then might be the companies and designers who are more willing to consider or use labels.

4.3 Other factors affecting the implementation of labels

Almost all of the designers said that they are not explicitly asked to consider environmental issues during the PDP by their company. Some said they personally don’t and wouldn’t consider environmental issues through the idea generation or concept development stages; with some saying they would not consider them at any stage of the PDP. Of those who did say they would consider environmental issues, their responses are displayed in Figure 4.3. The 10 respondents who say that they would consider environmental issues when writing the design brief are from a total of 24 who previously said that they have some involvement in the writing. The most common times were in design development and materials selection stages.
Figure 4.3 Times during the PDP that designers would consider environmental issues (n=30)

1A said that the reason they do not consider environmental issues during the early stages of the PDP is:

‘Because it would be an extra time pressure and already we [designers] have enough to think about […] it’s always tough, even when you’re not in a recession, and time is always tight, so to have to then think about an extra thing which you don’t really have to think about. The product will still be sold and be successful whether you think about it or not arguably. So it’s an extra thing which is really not needed during the design process.’ (1A)

This is quite intriguing given their positive view of the value of ecodesign through their survey and interview responses. It was further argued by 1A that actually implementing an ecodesign strategy depends upon the background, previous education and personal interests of the individual designer. They clarified this by saying:

‘I would suggest that the only reason I would even consider the eco-impacts or the sustainability of a product at the development and material selection stages is because I have a background in it. I would suggest that other people [designers] who don’t have such an involved background in it probably might not even consider it at those stages either.’ (1A)
This suggests a need for designers to have access to knowledge of ecodesign principles and methods.

Approximately half of the participants regarded the protection of the environment to be important, but the other half did not express much of an opinion as they were more concerned with money and profit as a professional. 1E said ‘Every process has its own key performance criteria. Sometimes cost, mostly cost I would have thought.’ The attitudes and opinions of individual designers about their responsibilities towards the environment and society varied greatly, even amongst designers within the same company. When asked about designers in general, 1G’s response was ‘It should be designers who push environmental design’, while 3G within the same company (Company G) said that designers were ‘…no more responsible than other people in the general public [consumers]’.

What was of real concern was that designers who appeared to receive the most open briefs often seemed resigned to the fact that they couldn’t make a difference even if they wanted to try. 3G claimed customers and clients were only concerned with the environment if it was to improve their corporate image. Other designers expressed their disillusionment at the difference they felt they could make to reducing the environmental impact of a product during the PDP. Although they provide different design solution options where possible, ultimately the final decision rests with the customers and clients because ‘at the end of the day it’s their business. We can only take them so far down the process’ (1E). As mentioned previously, it was the designers’ understanding that this was primarily for the benefit of the company with the aim of attracting more business by appearing more environmentally and ethically conscious.

There were some examples of designers who did implement labels, such as those at Company F. As part of their design team, they had designers who were also involved in conducting market research and marketing strategies. This meant that the designers had more involvement in the Brief setting and in the marketing of products. 1F and 6F both said that it was very beneficial to the company and to the products they designed, because they had a better
understanding of their target markets, thoughts and knowledge of environmental issues and some labels. They designed some products that carried labels, and had known that their consumers were aware of these specific labels before they were applied to the products. This is in contrast to other participants who did little to no market research beyond looking at competitors’ products. If large competitors implemented a label, some of these designers decided to follow, but they were not willing to make the first step. 2G said:

‘If the big boys use a particular label, then we would consider it. If they don’t use a specific label, then we would question why should we? Surely if there was any benefit to be had from using this label the larger companies would already be doing so.’

Company C, although not actively using any labels aside from recycling symbols, had recently become ISO14001 accredited with the main objective of securing government contracts that were put out to tender, because of increasingly green public procurements. Designers in this company said that by becoming ISO14001 accredited, and making the required changes, they had also experienced additional unexpected benefits, such as reduced materials use and waste, by designing reusable modular components as opposed to bespoke units for every project.

From these two examples we can see that market and client factors have had a role in influencing designers’ to apply labels in their work. Given the two concerns above, of profit and designers’ low control over the design brief, questions are raised over the responsibility of designers towards ecodesign, despite some literature stating that this is part of their responsibility (e.g. Lefebvre, 2003; de Eyto et al., 2008), including the use of labelling. In these circumstances, it is important for us to discover what designers know about labels.

4.4 Designers’ existing knowledge of labels
During the questionnaires respondents were shown a range of environmental labels currently active in the UK and/or EU and asked whether they recognised and could identify them. Participants’ knowledge and understanding of ecodesign and environmental issues were varied. Most respondents claimed to recognise different forms of environmentally sensitive design (green design, ecodesign, sustainable design), but very few provided accepted definitions (as offered in Chapter 1). Some labels clearly stood out as being recognised by the vast majority of designers, including the Tidyman logo (Figure 2.11) and the WEEE logo (Figure 2.16) whereas some were hardly recognised at all, perhaps most significantly, the EU Ecolabel (Figure 2.3). As a European wide Type I label, this is available to be used on a variety of product ranges and has been in existence since 1992.

However, when it came to their understanding of what information the label was trying to transmit, there was quite a gap. The meaning of some labels could have been ascertained through their design, allowing participants to make an educated guess. Examples of these include the WEEE Directive and the Tidyman logos which both visually represent the information they are trying to deliver. Other labels use text such as the Soil Association’s Organic Standard logo (Figure 2.5) to enable their message to be easily identified. However, the use of text is not always sufficient to avoid confusion. One example of this is the Carbon Trust’s Carbon Reduction Label (Figure 2.8). Most participants considered that it was displaying the Carbon Footprint of the product, but further questioning revealed that they were not aware of what constituted a “good” value or where the most significant areas of carbon emission are during the product life cycle.

Another source of confusion occurred because of the similarity between some label designs. This was particularly highlighted by the Green Dot (Figure 2.13) and the Universal Recycling Symbol (Figure 2.9) with respondents regularly claiming that both labels meant the same thing, which is not the case in this example. These results indicated that even if a label is familiar, it is not necessarily understood correctly. Hence, although many participants showed some level of knowledge of environmental labels and schemes, it was
sometimes limited and misinformed or even incorrect to the point of being the exact opposite of the label’s intention. For example one participant thought the Tidyman logo was a 1980’s advertisement campaign and no longer in use. Some participants believed the EU Ecolabel to be something associated with the Euro currency. As noted above concerning when label processes are implemented, of note was that one respondent said that applying labels is a last minute thing. This also suggests some low knowledge of how to implement labels and when they need to be considered in the PDP.

4.5 Requests for more knowledge

Given that there was some low knowledge of labels among these designers, this stage of the study also asked participants to identify whether they desired further knowledge, and what this might look like. One common response was that they would like to know what each label means. Considering these findings, it may be possible to find a way to incorporate the features and benefits of environmental labels into ecodesign strategies employed by companies. Alternatively to develop an ecodesign tool or methodology based around environmental labels, improving the design as well as facilitating easy labelling of products. A number of methods and strategies were raised in the interviews for delivering the information that designers felt they needed to know about environmental labels.

Two thirds of respondents indicated that a tool which ensures the products they design are eligible for specific environmental labels would be most beneficial to designers (themselves and/or other designers) and their company. A high proportion of respondents said they use resources to assist them with aspects of their design work. When asked if they thought that they should be made aware of resources such as databases of environmentally sensitive materials, most agreed that it would be beneficial to their work. Table 4.3 suggests that designers find ecodesign guidelines very or quite useful and that many look at the products of their competitors for inspiration. They also do not have a lot of experience with LCA software; this is important considering that many
environmental labels are based on carrying out an LCA; if it is something that they are unfamiliar with, they may feel less inclined to suggest applying a label of this sort.

<table>
<thead>
<tr>
<th>Rate usefulness of ecodesign resource/tool if you have used them</th>
<th>Materials Selection Databases</th>
<th>Life Cycle Assessment (LCA) software</th>
<th>Inspirational Products / Materials</th>
<th>Ecodesign Guidelines</th>
<th>Environmental Label Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Useful</td>
<td>10</td>
<td>2</td>
<td>15</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>Quite Useful</td>
<td>13</td>
<td>11</td>
<td>11</td>
<td>20</td>
<td>8</td>
</tr>
<tr>
<td>Not Very Useful</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>No Use At All</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Not Used</td>
<td>19</td>
<td>27</td>
<td>11</td>
<td>11</td>
<td>26</td>
</tr>
</tbody>
</table>

Table 4.5 Usefulness of tools/resources, if used (n=30)

In a free text box, survey respondents were asked to suggest features they would like in an environmental label-based tool or methodology. Most common were answers concerning clarity: ‘clear set of guidelines for each stage’ (Respondent 7) and ‘to clearly state the regulations by which you must comply’ (Respondent 9) and integration into existing practice: ‘make it easy for me to include it in my work, make it a no-brainer’ (Respondent 25). Importantly, others asked for examples of successful application, and information on the benefits:

‘I would like something that would clearly show benefits to the company and provide [an] education’ (Respondent 10)

‘Past examples of successful products and features which can be incorporated’ (Respondent 1)

Asking more specifically what information might look like, in interviews the designers considered methodologies, references and tools. The idea of telling designers what to do by imposing a methodology upon them was not popular:
any resource will ‘... have to be careful not to lecture designers on how to design’ (2C). Most designers said they work by using their own personal approach to designing; and others a process set by their company. Others claimed that using a methodology could be more time consuming and not practical:

‘should you go back to say being at university and all of the theory stuff that was taught about how to choose and narrow down concepts and all that stuff, all that sort of methodological approach just doesn’t apply in my experience to the real world scenario’ (1A).

A view often shared by the designers who were recent graduates in this study was that the way in which students are taught to design may have little relevance once they are in the world of work. Pressures of time especially for in-house designers mean product generation or conception stages are short and there is less creativity at the “fuzzy front end” (Koen et al, 2004 cited in Annable and Burns, 2009).

An alternative option was a reference source which appeared to be more popular. Interviewees had experience of using reference materials, such as those used to find information on materials in catalogues; component specifications from manufacturers or suppliers; and product comparison and inspiration through online searches. 2A said that the reference resources they use are ‘really good, it’s quite often the case that there is just one bit of information that is relevant to what I am designing, so it’s quite specific.’ 3C suggested a search function that could perform very relevant searches and allow them to filter results to quickly find the specific required information. References can be used intuitively and are then already a part of designers’ experiences. However, due to time pressures it was clear that specific information must be easy and quick to find if a reference source were to be used regularly. A reference source could enable designers to find out which labels are relevant to their project before they start designing, and to have information on what label criteria means for their designs before and as they are designing. This could be used by those designers who influence the setting of
the design brief to inform colleagues about relevant environmental labels and the potential impacts of using them.

The final approach proposed was an interactive tool which the designer engages with throughout the design process. One benefit that was suggested by interviewees was for them to see how their design decisions impacted on the product and the labels that could be applied to their design in real time. The interactive tool could also suggest different design ideas and solutions such as considering a different material or alternative label. An example 1B gave:

‘I would like to see something that is a bit more organised in that you have a certain product and you have a list of all the labels so that when it went through production and you have a works order where you pick all the parts for the job, at that point it prints you off a works order it prints you off all the labels needed for that batch of products with the correct serial numbers on and so forth so that’s it’s all there and you can’t not put the labels on’ (1B).

1B worked in a company (Company B) where they actually had a lot of experience of having to subject products to testing (both in-house and at external test-houses) in order to satisfy legislative requirements (e.g. safety compliance), which could take up to six months. Given the amount of work this created, 1B’s position on labels was that information needed to be offered simply and easily for designers. 1B shared a story of a client demanding a product comply with a specific standard which Company B had to purchase, read and make sense of – only to find it was not actually relevant to the UK market where the product was to be sold. Other designers said that some customers have asked for specific product information (e.g. energy efficiency ratings) but they do not always seem to understand what they are asking for.

This raises an issue about the level of general or working knowledge that designers have in being able to make quick decisions about the relevance of a label or piece of legislation before spending unnecessary time pursuing a fruitless route. It can be difficult to work out which standards and guidelines are relevant to a product especially if they are new. For instance, British Standards
must be purchased before they can be read and understood for relevance to the product. More simple or accessible information would enable designers like 1B to quickly share information and advise clients. This example is indicative of designers asking for a tool to inform decision making at all stages of the PDP. Similarly, 2A said:

‘I need to know which sort of which labels […] apply. Are any compulsory for certain end outcomes or depending what I am trying to achieve I guess? So I would need to know the legislation and the thinking behind them’ (2A).

Interviewees suggested that the resource should be internet-based. One reason for this was the speed at which information can be found and retrieved:

‘A website would probably be … more relevant [than a book] [and be where] I would actually find the information more quickly.’ (2A)

A physical catalogue of environmental labels could become outdated quickly, a problem not suffered by an online resource which could be updated instantly. Regular updated information about the latest scheme developments and new label information could be beneficial to designers in companies looking to take a lead in the marketplace. Interviewees indicated that they already use the internet for other research including on new materials (2A, 3B), market research (1A), component and specifications (3B). 2C said the ‘internet is quicker and easier to use [than other sources].’ An online resource also has the advantage of directly linking to other sites for more information, such as those for label-awarding bodies.

Summarising from interviewee responses, other features that an interactive tool might comprise included:

- Examples of products designed with environmental labelling criteria in mind
- Good and bad examples of environmental labels applied to products
- “Ask an expert”
- Forum
- Frequently Asked Questions (FAQs)
• Rating of labels e.g. which are the best, the easiest to apply, the most recognised or respected
• Costs e.g. application, annual subscription, percentage profits
• Access to labels and labelling schemes

4.6 Conclusion

Much of the data presented in this chapter indicates that knowledge of environmental labels, and the processes for applying them, was at times low among some of these industrial designers. Those who knew most tended to have experience of applying labels previously in their design work, or were those with a recent university education where they had been exposed to a number of ecodesign practices, potentially including labelling processes. However for others, their knowledge came from their experiences as consumers of products with labels rather than as designers who had applied labels to their own designed products. Their understanding of the meaning of the different labels were often an educated guess based on the appearance of the label. This was often incorrect and occasionally the exact opposite of the label’s intended meaning. The results also suggest that the influence of environmental labels on industrial designers varies depending on the type of label.

Those participants who demonstrated an understanding of some label schemes said their knowledge had come from encountering them during their work. Some who had used labels had been motivated by what they saw as shifts in the market, but having launched a product with a label, they encountered poor sales. Some claimed they needed more information or simpler, easier to access information in order to successfully implement labels. Within some companies, notably Companies A, B and G, individual designers varied greatly in their position on environmental labels: one might be supportive of and knowledgeable about labels, and another cynical or naïve. Each company had at least one designer who expressed an interest in environmental labels. Decisions concerning whether to use a specific label are often not in the hands of designers and may depend on their involvement and influence in the setting.
of the design brief. However, knowing more could potentially help them to persuade those with the power to make that decision. Some felt unable to use labels through a lack of resources and time, were scared to begin, or had perceptions of green processes being expensive or risky.

At this stage of the research project, the designers said that they felt there would be benefits from knowing more about labels, but what those benefits might be could be investigated further. There was a general sense that being better informed would enable them to make more educated decisions about using labels. If designers claim to need certain knowledge of labels, what happens when we give them this information? Do they still recognise that it would meet their needs? Some expressed a desire for simpler, easier to access information, and others disclosed a misunderstanding and hence a need for further attention if designers are able to successfully implement environment labels on their products. They wanted facts about what the labels mean, where they are applicable, and which labels are suitable for the products they design. They also wanted to know the potential advantages they could expect from using a particular label, such as increased market share or improved consumer confidence in the product. This information is considered key if designers are to convince their company and/or clients to apply a particular label to their product, especially if there is a cost involved. Once they know this information, they need to know the process for applying a specific label and how that is likely to impact on their design process. What happens if we provide them with the knowledge that they claim to need? Will this help? Might this uncover reasons for existing resources on environmental labels such as Ecolabel Index not being used? Hence, a resource was designed and prototyped to elicit further data collection (in the Main Study) with designers, discussing their use of label knowledge and capacity to implement it. Following the analysis of the data gathered through the Preliminary Study as presented in this chapter, it was decided that the next stage of the research project would be to create a prototype environmental labelling-based resource for designers. The resource was to consist of the features and content suggested by the participants during the interviews. This is introduced in Chapter 5.
5 RESOURCE DESIGN AND DEVELOPMENT

This chapter outlines the design and development of the prototype Resource ‘DELR’ (Designers’ Environmental Labelling Resource) based on the findings from the Literature Review (Chapter 2) and Preliminary Study (Chapter 4). It documents the design and development of ‘DELR’ using the criteria identified in Chapter 4.

5.1 Overview of the Design and Development Process

The purpose of producing the prototype resource was an attempt to further investigate the findings from the Preliminary Study: that the majority of the designers indicated that greater knowledge of environmental labels would be of benefit to themselves, their company and/or the products they design. The Preliminary Study gave an insight into the current use of labels in the PDP of SMEs (research question 2); designers’ current knowledge of labels (research question 3); and the current influence of labels on designers (research question 4). However, research question 6, on the factors affecting implementation of labels, was not fully answered: what would designers be able to do if they were provided with the knowledge they claimed to need concerning labels? Additionally, it would be possible to further consider research question 5: if designers claim to need certain knowledge of labels, what happens when we give them this information? Do they still recognise that it would meet their needs?

5.2 Web Based Format

From the findings of the Preliminary Study it was decided that the most appropriate method of presenting information to designers was using a mock-up of a web based format. The justification for a web format included supporting a strong visual format, so reducing the amount of reading required; ability to
instantly update the information/contents; provide direct links to related websites; offer access whenever required, making it easier to integrate into design processes; contents can be shared with other practitioners within a company and potentially with clients; and potential for content to be interactive, making it more appealing and relevant if it could be personalised.

In an attempt to make ‘DELR’ both recognisable and believable as a website to the designers who would be interacting with it, literature on website design was consulted to inform the creation of a mock-up that looked like a website. Ease of use, navigation and maintenance were guided by Employers’ Forum on Disability (2001) and effective Website design by Zhang and von Dran (2000), Tan and Wei (2006) and Tarafdar and Zhang (2008). The researcher also looked at a range of well used information and retail websites in order to identify aspects such as appearance, common layouts and navigation. This built on the work of Tarafdar and Zhang (2008) who studied 190 websites to identify successful features. It was anticipated that using this information would help to make ‘DELR’ look more professional by conforming to these common features. The Employers’ Forum on Disability (2001) guidelines on accessibility were also of particular assistance on text alignment, density and graphical icon use.

However, ‘DELR’ was not meant to be the perfect representation of the final version of the Website. It was felt that a “prototype-feel” to the resource encourages feedback from users (Allan et al., 1999) and would help focus attention on the content rather than the aesthetics. As mentioned previously, the primary objective of the resource was to verify the findings from the Preliminary Study through being scrutinised as an elicitation tool in the Main Study. For this reason the design and function of ‘DELR’ had to be compromised to allow for the necessary tests to be conducted.

A variety of software packages were used to create ‘DELR’. Adobe Photoshop 7.0 was used for designing the overall background theme, page templates, buttons, as well as general image manipulation. ‘DELR’ was developed using Microsoft’s® Office PowerPoint™ 2007 using the ‘Browsed at a kiosk’ Show type. The site was constructed using slides within a number of presentations
that were hyperlinked together. The user clicks on animated buttons to navigate through the resource. Each button uses a hyperlink to take the user to a specific page within a designated presentation. This gives the impression of a functioning web site by allowing the user to choose the order they wish to view the pages.

Creating numerous presentations to construct the body of the Resource had several advantages. Firstly this made the resource a more manageable size rather than having to deal with a single PowerPoint presentation of over 400 slides. Each presentation formed a different feature of the website, which made it easier to number hyperlinks between sections and any amendments made to a feature, adding additional slides to a feature for example, would not have a knock-on effect on all the hyperlinks that followed it. The whole resource was stored and run from a USB memory stick. Features found on internet browsers such as a back button to view the previous screen were simulated using hyperlinks too. Having the files available to access allowed for errors to be fixed quickly and amendments based on feedback made instantly.

The Forum and Ask an Expert feature was constructed using a template on a free online survey website. This was quicker and produced a better result than was anticipated from attempting to create a mock-up. This also allowed the forum to be up and running throughout the testing phase and beyond. The online forum was accessed directly by a hyperlinked button on the Home Page of the resource. Although some features which used databases would have included an enhanced search facility (allowing the user to type in a key word) this proved difficult to simulate in the prototype. Instead the option was presented so designers who took part in the testing of the Resource could indicate if they would have used that particular function. Selected images to simulate how the resource could appear on a touch screen smartphone where also shared with Main Study interviewees as an example of how it might look as a mobile app.
5.2.1 Navigation

This section describes the navigation mechanisms utilised throughout the web-based resource and how they aid usability. The way in which a user moves around a website is known as navigation. To maximise the usability of the website navigation should be logical so users know where they are. They should also know how to return to the previous page or the beginning should they become lost (Employers’ Forum on Disability 2001). Tan and Wei (2006) recommend when designing a website, ‘...focus on the users’ needs, which is to find their way around in the Websites easily, comfortably, and enjoy the process’ (Tan and Wei, 2006, p.269). ‘DELR’ consisted of several streams, with each stream providing information through a feature of the website. These streams were all connected by a Homepage as illustrated by the schematic diagram in Figure 5.1, with each stream shown as a different colour.

![Schematic diagram of the navigation chart for the prototype resource](image)

**Figure 5.1** A schematic diagram of the navigation chart for the prototype resource

The Homepage (see Figure 5.2) formed the starting point for navigation around the site. From the Homepage the user could access the stream (feature) of their choice by clicking the mouse on one of the (animated) title buttons. Doing this would take the user to one of the pages illustrated in section 5.4 of this chapter.
As can be seen in Figure 5.2, a brief description of each feature is provided next to the buttons to inform the user about what they can expect from them. An example of each style can be seen in Figure 5.3 and navigation of an individual page in Figure 5.4.

**Figure 5.2** The Homepage of ‘DELR’
Figure 5.3 The 8 different styles used throughout ‘DELR’
5.2.1.1 Creating levels of information

The content of the various features of the Resource was structured in a tiered system. This approach presented small amounts of key information with the option for the user to access further data if desired. This was facilitated by the user clicking on the relevant hyperlinked button or words in the text (see Figure 5.5). Doing so would take them to another page containing more detailed information. This system avoided users having to read lots of text before deciding if that data was relevant to them (Employers’ Forum on Disability, 2001), and at the same time providing access to the important data which would
have been lost if only a basic overview was given. It also enabled users to move onto a more appropriate section quickly which could be significant because of the time pressures on designers that was stressed in the Preliminary Study.

Links were made between the different streams to a related page. For example, the material information page for plywood in the Material Selector feature displayed which labels are relevant, which were linked to pages including the FSC in the Label Information feature. This is illustrated by the green arrow on Figure 5.5.

Figure 5.5 A schematic diagram to illustrate the links between the various streams and external websites

5.2.1.2 Navigating beyond the resource

Hyperlinks were also made to external company and organisation websites from features within resource where suitable (as illustrated by the red arrow in Figure 5.5). This enabled users to access more specific detailed information, and in some cases make direct contact with experts who could assist with their work. These links included awarding bodies responsible for specific labels, companies
featured in the Case Study feature for more information about their experiences, and detailed data sheets for properties of materials (Figure 5.6).

The Carbon Reduction Label helps consumers see at a glance which companies are working to reduce the carbon footprint of their products.

Independent third-party verification by the Carbon Trust Footprinting Certification Company helps to ensure measurements are robust and credible and gives integrity to company claims. It can also help identify hidden opportunities for greater efficiencies and carbon savings within your operations and supply chain.

5.3 The Presentation Style of the Content

The presentation style of ‘DELR’ has already been illustrated in the figures presented earlier in this chapter. Feedback was gathered during the development of the resource from researchers, undergraduate Industrial Design students and practicing professional industrial designers, who were all shown mock-ups of the background theme, layout templates and various features. The decision to involve a number of people from a range of backgrounds and
experiences was an attempt to replicate the process commonly used in web design today.

The development process was considered essential for the potential success of the Resource. Tan and Wei (2006) said ‘badly designed Websites frustrate users and cause them to leave as they cannot find what they need’ (Tan and Wei, 2006, p.271). A number of amendments were made to the layout template during the development process, which is illustrated in Figure 5.7. This shows the initial design (left) and the developed final design (right) of the same page on the Product Selector feature.

Another of the findings from the development phase testing was an overwhelming preference of the inclusion of images when making selections rather than relying purely on text. An example of this was two different versions of the Product Selector feature which is shown in Figure 5.8. The vast majority of testers preferred the more visual nature of the image and text version (right) over the purely text-based version (left). Some remarked how it looked more professional and believable as a similar style is used by large online retailers. Because of this feedback, only the image and text version was developed to the stage of testing ready for the Main Study.

![Figure 5.7 Example of amendments made during development](image-url)
Images were used wherever possible (and relevant) in order to make the information more visually appealing, provide examples of what is being discussed e.g. a specific label on a product or packaging, and reduce the amount of lengthy text required. There was a general consensus amongst the designers involved in the development of ‘DELR’ that they could see that the content was aimed at designers. They all remarked that the presentation style made the information clear, although some thought that in its current form it was visually “plain” and “boring”. At this stage of the research project the primary focus was on the content of the resource so the graphic design was purposely kept clean and simple. However, the aesthetics and appearance were also recognised as important factors for use and re-use.

5.4 The Content of the Resource

The content and structure of the Resource came mainly from the findings of the Preliminary Study in which designers said they wanted information divided into features such as examples of products designed with environmental labelling criteria in mind; the costs associated with applying specific labels; and details about compulsory schemes or legislation. Findings from the Literature Review were also considered, such as the level of detail (e.g. Houe and Grabot, 2009) and type of information about labels given (e.g. Kishita et al, 2010). The information was presented in separate sections or streams. This section explains the content of each feature that makes up ‘DELR’. They are presented
in the order that they appear on the Homepage (see Figure 5.2) which itself was ordered based on findings from the Preliminary Study and grouping of similar features.

5.4.1 Environmental Label FAQs

This feature aimed to quickly, clearly and simply answer a number of questions commonly asked about environmental labels. The list of questions (that are listed on the left of the screen in Figure 5.9) were formed based on both the responses from the Preliminary Study and some were adapted from websites including those of DEFRA, Carbon Trust, Energy Saving Trust, etc. The answers to these questions were derived from these websites and the Literature Review. The information was presented in three sections: firstly an initial overview consisting of a couple of lines; second a bit more detail, and the third in bullet points. The reasoning behind splitting the information in that way was to give the reader the choice to read as much or as little as they like without the need for additional clicks. If they only wanted to scan the information they could move down to the bullet points after reading the first section. The repetition of information was intentional to emphasise key points to the user (see Figure 5.9).
5.4.2 Case Studies

This feature was designed to provide real life examples where an environmental label has been applied to a product and/or service. It contains case study examples of both labels applied to products and products which have had a label applied to them. Both could be searchable e.g. find examples of products that have had the Carbon Reduction Label applied to them. The company case studies were listed on the left hand side of the page in the same way as the questions were displayed in the ‘FAQs’ feature. It was intended that each case study would contain important information relevant to designers, including costs, how it was applied, benefits to product, benefits to the company, impact on market share, etc. Both examples given were based on the same label (Carbon Trust’s Carbon Footprint label) to allow for direct comparison of information between the two examples, as each had slightly different information applied.
These are taken based on the information available from the Carbon Trust website.

The information was presented on a single page. This made it clear and concise, easier to make comparisons, and could be kept as screenshots or printed out as a single page case study. Further information was available via the hyperlinks to the company’s and labelling body’s websites. Each page consisted of a headline in bold font about the relationship between the company and the label. A few short paragraphs containing key information considered relevant or interesting to designers followed.

The first example (Figure 5.10) included a picture of the product and the label, whereas the second example (Figure 5.11) showed the label placed on the packaging of the product as well as the label itself. Although a food product, Walker’s Crisps is a well-known brand; explaining their use of this label to designers was relevant as they would have been aware of the brand. Walker’s were also one of the first companies to work with the Carbon Trust in this way. The information in these slides has come directly from the Carbon Trust website. There are very few examples of companies using environmental labels which provide this level of detail or statistics. Walker’s were also the only case study available at the time which gave a monetary value to the savings made through working with the Carbon Trust.
The Dyson Airblade™ hand dryer is the first hand dryer to be awarded the Carbon Trust’s Carbon Reduction Label.

The machine’s total carbon footprint from its lifecycle was measured and certified by the Carbon Trust.

The footprinting process revealed that the Dyson Airblade™ AB04 - hand dryer emits 550 kg/CO₂ per year. Total emissions during its lifetime are 1.5 g/CO₂ per dry. Each dryer is equal to the carbon emissions created by watching just less than 3 minutes of television.

Unlike conventional hand dryers, the Dyson machine does not require a power-hungry heating element to dry hands – making it 80% more energy efficient. And it avoids paper towel waste in landfills.

As part of the certification, Dyson has committed to reducing the Airblade™ hand dryer’s carbon emissions further in the next two years.

Further information available on collaboration of Dyson and Carbon Trust.

Walkers were the first ever brand to display a Carbon Reduction Label on their packets in 2006.

Walkers teamed up with the Carbon Trust to map the carbon footprint of their Cheese & Onion crisps back in 2006. Since then they have worked closely with the Carbon Trust to ensure consumers understand the significance of the world’s first ever Carbon Reduction Label.

Results have been substantial – in just two years Walkers has reduced its carbon footprint by 7% (or 8g of CO₂) to 80g per packet. The carbon emission reductions saved them an estimated £400,000 which they have reinvested into more environmental initiatives, for example hosting Sustainability Summits with suppliers.

Walkers were the first company to retain the use of the Carbon Trust’s Carbon Reduction Label as their customers claim they welcome the Label and commitment it represents.

Further information available on collaboration of Walkers and Carbon Trust.
The Product Selector feature aimed to reduce the confusion associated with applying different labels to a product by illustrating which compulsory and optional environmental labels are applicable to the specific product and market the user is designing for. Results from the Preliminary Study revealed that not only is there confusion about which labels could and should be applied, there were occasions when clients had specified a label be applied to a product which turned out to be irrelevant. The user starts by choosing the category of product they are designing (Figure 5.12). Their selection is refined down through further selection pages until they have found the product (e.g. a kettle) or nearest comparable product (Figure 5.13a,b). They are then asked what market the product is to be used in from a choice of ‘Domestic’, ‘Industrial’, or ‘Domestic and Industrial’ (Figure 5.13c). The feature then presents the results in two lists of environmental labels that are specifically relevant to that product. The first list displays the compulsory labels which must be applied e.g. WEEE logo for any electrical products. The second list displays the optional labels that can be applied which range from free-to-use voluntary labels to use through to subscription-based third-party certified labels (Figure 5.13d). The user can find further information on any of the labels by clicking on the image of them (button hyperlinked to Label Information page of that label.)

![Figure 5.12 Product Selector Menu screen](image)
Figure 5.13 The progression of pages in the Product Selector feature
5.4.3 Material Selector

The main aim of the Material Selector feature was to show which environmental labels – both compulsory and optional – are applicable to a specific material. The feature also provided some basic information about the selected material and suggested alternative materials that could be used that could have environmental labels applied to them. The user begins by selecting a material using one of a number of options as illustrated by the Material Selector menu screen in Figure 5.14. Most of the Preliminary Study designers already had a material predefined but some had some say in selecting materials. Therefore the menu screen was included to gauge in what capacity designers would want to search for materials. It acted as a visual prompt to two questions asked during the interview: 1. Which would you use to find information about a material you already know you are to use e.g. Polypropylene?; and 2. Which would you use if you did not know / unspecified a material you are to use for your product e.g. it has to be a polymer/plastic? It was possible to use the same template pages and structure created for the Product Selector feature, and in doing so improved the usability through familiarity for the user. Figure 5.15 shows the stages of the process of finding plywood using the Material Category selection criteria, where the user’s choice is refined through a series of selections.

Figure 5.14 Material Selector menu screen
Once the desired material had been selected, the user was taken to the first of three linked pages associated specifically with that material. The first page displayed the ‘compulsory labels’ that had to be applied to the material, from which the user could find further information about a label by clicking on the hyperlinked image that would take them to the Label Information feature (see section 5.4.5). The user could also choose to see the ‘optional labels’ that could be applied to the material (see Figure 5.16) or see suggestion for alternative materials that could be used that qualify for different environmental labels. All
three pages also contained links to external sources of information, in this case to materials databases.

![Material Information](image)

**Figure 5.16 Material Information optional label information page example**

### 5.4.4 Label Information

A selection of 20 environmental labels that are the most prominent and currently used in the UK were chosen to populate ‘DELR’. This selection included representatives from each of the types of labels noted in Figure. 1.21 and Table 1.3, including Type I, Type I-like, Type II, usage and disposal information, certificate of compliance, recycling and ecological labels. The scope of the labels selected covers all labels types available in the UK, the labels are in common usage and also include the two most significant labels not used in the UK (see Boundaries of Study section 1.4.1). There are 458 labels in 197 countries currently (as of November 2014) listed on Ecolabelindex.com, however most are not relevant to the UK. Additionally, this index does not cover all Type II labels, given the nature of self-declaration claims that this Type
covers. The aim of this feature was to provide clear and concise information about a specific environmental label to the user. This information included a basic overview of the label, impacts of that label on designers, and impacts of that label on manufacturers. This feature was constructed in two parts: the first was a method for selecting a label. Like the Product Selector and Material Selector features, the user had a choice of how they would locate the label they wanted information about. The menu screen they were presented with can be seen in Figure 5.17. An example of the ‘View all labels’ screenshot can be seen in Figure 5.18.

Figure 5.17 Label Information menu screen
The second section of the feature was the information about the labels themselves. The information about a label was spread across three pages. The basic template used for each page was the same as that of the material information section of the Material Selector feature, with an image of the label displayed on the left and some key information about the label on the right (see Figure 5.19). The criteria of the key information list remained the same for all labels, allowing for quick and easy comparisons to be made. The first page also included a basic overview of the label so the user could quickly decide whether the label was of interest to them. Two further pages displayed information on how the use of that label would impact the work of the designer or the manufacturer (see Figure 5.20).
Figure 5.19 Label Information overview page

Figure 5.20 Label Information impact on manufacturer
5.4.5 Label Design Assistant

This feature aimed to provide specific assistance and advice to designers regarding environmental labels. From the Preliminary Study results there were a number of suggestions as to what this advice could include, but there was no real consensus as to what or how it could function as a feature or features. Therefore it was decided not to simulate it, instead using the space to display the ideas suggested in the Preliminary Study so feedback and ideas could be invited during the Main Study. All the suggestions were grouped into three categories: Before the Design Process (BDP), During the Design Process (DDP), and After the Design Process (ADP). These were used as a basis for a discussion within the interview for the designers to talk about the ideas whilst being able to see them for reference.

5.4.6 Forum & Ask An Expert

This feature aimed to combine an interactive online community of professionals considering or using environmental labels with a helpdesk. In the Preliminary Study a number of designers said they would look to use an online forum to find information about environmental labels or to answer a specific question they had. It was hoped that designers would use the forum to share experiences of applying labels to their products, both positive and negative. The forum also acted as a contact point between designers and professionals involved in the awarding of specific labels, where a question could be put to an expert in the field.

The forum was constructed using a free online forum maker and host from myfreeforum.org. Within the forum, sections were defined as ‘Types of environmental labels’, ‘Questions on Environmental labels’ which featured the same list of FAQs as in the feature in ‘DELR’ and the ‘Ask an Expert’, ‘Environmental Labelling in action’ for people to share experiences of using
labels, and ‘Background to the Designers’ Environmental Labelling Resource’ which included information about the research project behind the resource. A screenshot of the forum upon launch can be seen in Figure 5.21.

The Forum was launched in June 2011 at http://environmentallabelling.myfreeforum.org and was live for the duration of the Main Study. It was intended for the forum to evolve to fit the needs of users.

![Figure 5.21 Screenshot of the Forum](image)

### 5.4.7 Background to Resource

This final feature provided the user with background information about ‘DELR’ and the research project behind it. The first page outlined the research project undertaken by the researcher and the reasoning behind it. The second page detailed the data collection phases of the Preliminary Study and the design and development of the resource (see Figure 5.22). The third page explained what was to happen after this stage of testing and the proposed plan for future
developments of the resource which ultimately would result in a functioning resource being launched to aid designers in the UK.

**Figure 5.22** Background feature – Development of the Resource

### 5.5 Conclusion

The two most important elements of 'DELR' were presentation and content: what it looked like and what it said. In presentation terms, it was important that the features and the Resource as a whole were accessible, readable and encouraged users to continue to access it. It was possible to incorporate a great deal of the Preliminary Study suggestions and requirements into the Resource. 'DELR' represents an investment into creating a resource for labels in which designers have had a significant impact. The result is a single site in which knowledge and advice on environmental labels was gathered for designers' practical use. It represents the first attempts made to present specific and relevant information about environmental labels to industrial designers. Its
primary use however was as an elicitation tool for the Main Study – once faced with the information they asked for, did designers find it met their needs? How might it help to convince colleagues or clients, or enable designers to contribute to PDP or brief setting? The resource was to be used to elicit responses on further factors that could and do affect designers’ implementation of environmental labels. By working through specific information and a mock-up of real life design issues, including suggestions of how environmental labels may be ideally presented in the design brief (for example, a key part of the marketing strategy for the product to carry the FSC logo so materials must be from a certified source and produced using an accredited manufacturer in order to comply with the FSC label criteria ), prompted further discussion of designers’ use of labels.
6 MAIN STUDY FINDINGS

This chapter outlines the findings from the testing of the resource. The testing involved a task analysis, observation, semi-structured interview, and anonymous feedback survey questionnaire with 16 designers in nine SMEs. One company (Company F) was a consultancy with four designers and the rest had in-house designers. See Tables 6.1 and 6.2 for full details of designers and companies. Additional demographic information of the designers can be found in Appendix vii. Designers are referred to by their code name e.g. 1H. Questions and comments quoted from the researcher are denoted by the initials DH. The data is drawn mostly from the observations and interviews, with additional significant results from the feedback survey also used where pertinent. This feedback survey is in Appendix xi and the data is tabulated in full in Appendix xii.

<table>
<thead>
<tr>
<th>Company</th>
<th>Participant (* if not industrial designer)</th>
<th>Preliminary Study</th>
<th>Main Study</th>
<th>Case Studies</th>
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<td>Interview</td>
<td>Interview</td>
<td>Feedback Survey</td>
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<td>Yes</td>
<td>Yes</td>
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<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
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<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
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<td>Yes (Part39)</td>
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<td>Yes</td>
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<td>Company N</td>
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Table 6.1 Designers interviewed during the Main Study
Table 6.2 UK SMEs involved in the Main Study

<table>
<thead>
<tr>
<th>Company</th>
<th>Market / Industrial Sector</th>
<th>Main Products</th>
<th>Market Served</th>
<th>Size (approx.)</th>
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<tbody>
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<td>Company A</td>
<td>Outdoor &amp; camping products</td>
<td>Rucksacks, Tents, Drinks bottles, personal GPS systems, etc.</td>
<td>B2C, B2B</td>
<td>40</td>
</tr>
<tr>
<td>Company H</td>
<td>Domestic Kitchen products</td>
<td>Food slicers, choppers, sealed storage containers</td>
<td>B2C</td>
<td>30</td>
</tr>
<tr>
<td>Company K</td>
<td>Industrial &amp; Domestic electrical goods</td>
<td>Vacuum cleaners, vacuum pumps</td>
<td>B2B</td>
<td>50</td>
</tr>
<tr>
<td>Company L</td>
<td>Outdoor and camping products</td>
<td>Jackets, Sleeping mats, Tents, camping utensils</td>
<td>B2C</td>
<td>40</td>
</tr>
<tr>
<td>Company M</td>
<td>Various (Consultancy)</td>
<td>Various, including medical, domestic electrical, kitchen products</td>
<td>B2B, B2C, B2G</td>
<td>15</td>
</tr>
<tr>
<td>Company N</td>
<td>Single-use plastic products</td>
<td>Vending cups, disposable cutlery</td>
<td>B2B, B2C</td>
<td>75</td>
</tr>
</tbody>
</table>

This builds on the work of Chapter 4 by using the Resource, ‘DELR’, as an elicitation tool during interviews with designers. The Resource was a visualisation of the information that the Preliminary Study participants claimed to need and/or want to know specifically about environmental labels. By presenting this information to them, the Main Study also picks up on themes arising in the Preliminary Study, enabling further probing relating to the research questions 2-6:

2. Where do environmental labels fit into the PDP of SMEs?
3. What do in-house industrial designers in SMEs understand about environmental labels and schemes?
4. How do environmental labels and schemes currently affect in-house industrial designers?
5. What information do in-house industrial designers claim to need and want to know about environmental labels and schemes?
6. What are the factors affecting in-house industrial designers’ implementation of environmental labels in their work?
6.1 Designers’ current knowledge of environmental labels

This section looks at designers’ current knowledge of environmental labels and labelling schemes. Firstly, how and where they acquired information about environmental labels, and then what knowledge they have and the accuracy of that knowledge.

6.1.1 Previous experience of finding information about labels

Around a third of the designers involved in the Main Study said that they had previous experience of finding and dealing with information about labelling in the past, although this was not just specifically about environmental labels. All said that they had started with an internet search using the Google search engine. From the results displayed, they looked for various specific types of website and viewed their content. Usually one of the first links to a website returned near the top of the Google search results page is for the free to use online encyclopaedia Wikipedia. All but one of these designers admitted selecting Wikipedia. They felt the need to defend or justify their choice by describing it as a good first call for answers because the information is presented in an accessible and consistent format of an overview, history, breakdown by type or topic, etc. However, these same designers also said that they did not entirely trust this information provided as it can be written by anyone. They all stressed that Wikipedia was not their sole source of information and used it more as a springboard or gateway to other sources of information on the internet. Some used the external links suggested on Wikipedia, with others returning to the Google internet search results page with a slightly clearer understanding of the topic.

‘I looked on various different sites. I think in the end I read a lot about it on Wikipedia and I know that is wrong but it laid out the information that I required in quite an easy way to read, and then
that had links to pages that I went to that were a bit more reputable.’ (1B)

Only 1A denied using Wikipedia in his previous searches for information about labels because they considered it to be a waste of their time, justifying it by saying ‘I would generally ignore everything on Wikipedia…’ (1A).

2B, 1B and 1A all said that they looked for information on the British Standards Institute (BSI) website. However, this was for general labelling advice on areas such as gas safety certification and fabric care labels. 1N said that they visited the WRAP website. 1N

1A had previously contacted Trading Standards after seeing a link on local council web page with information for consumers about various labels to look for on packaging. 1A was also the only designer said that they had visited the website of an organisation responsible for a specific label, that being the FSC.

Away from the internet, 1A admitted to looking at competitor products for guidance on which labels may apply:

‘With recycled logos we have in the past had quite long discussions about it because it does seem that different companies [use] different logos and that there is no one resource, no one overriding authority on what those graphics should be, what they should look like, or the text that should accompany them. So we have looked at our competitors and generally followed suit.’ (1A)

This could be a question about the standard of education this designer had? Although in this case 1A holds a first class degree in industrial design and has 3-4 years professional experience as an in-house designer (as revealed in the Preliminary Study online survey) and also has demonstrated an ability to search for information from a variety of sources. So does this instead reveal an insight into the reality that designers in SMEs may not feel they have time and/or the company have sufficient resources available to conduct their own research, instead relying on looking at what competitors in larger companies have done? This notion of companies lacking resources is common and was shared by 4A.
6.1.2 Understanding and misunderstanding of labels and labelling schemes

Designers generally demonstrated some knowledge and understanding of different labels and labelling schemes. They were all able to make educated guesses about what some labels could mean based on the design of the label when asked. At least some of the designers admitted assuming the meaning of a concept or label from the name, which were often incorrect. For example:

‘I see “eco” as more kind of energy and “green” more as resources, “environmental” probably more resources and carbon footprint, so I would try to break it down into those categories in my head, because that is how I personally see them.’ (3M)

Perhaps of greater significance were examples of clear misunderstanding of the meaning of some labels due to a lack of education or information about the label, both as a designer and a consumer. The type of misunderstanding that leads to consumers actively avoiding a product is likely to put off companies. One scare story could have a bigger impact than all the positive ones.

“I gave up buying crisps because it worried me that it contained that much carbon, that that much carbon was used but then I didn’t have anything to compare that to because I wasn’t fully aware of that logo… after a discussion in a pub about the bad, the, yeah the way they are produced [you] can tell how bad it is for the environment so I decided to boycott Walkers’ crisps. So that’s not really very good is it because they were just the first people [to put the carbon label on their crisps].” (1B)

1B is speaking as a consumer here. However it does imply that a lack of knowledge may be a key reason why designers don’t implement environmental labels. As a consumer a label designed to provide more information had put off 1B from purchasing that product. As designers too, some participants shared their worry at gaining misleading information or information they are unsure how
to properly deal with. From a label perspective, figures such as carbon footprint can be misleading if there is little context offered.

Another slight area for concern was that some designers questioned what made a label compulsory because, for instance, it is related to legislation:

‘But I don’t really know what it means by ‘Compulsory’. I mean I know what that means as a word but I don’t know why it is compulsory, and maybe [include] another little sentence saying after the waste reduction initiative that it is compulsory or whatever.’ (1M)

Some were surprised not just by the amount of compulsory and optional labels for their chosen product, but also by the number of labels which they did not recognise or know the meaning of:

‘As soon as I saw that [screen with the labels on] I thought wow, there is a lot there and a lot I didn’t really realise existed or that was compulsory.’ (1A)

Whilst reading through the ‘Development of the Resource’ page, 1H reflected that the Resource highlighted how little they knew personally about environmental labels. They found this surprising because they had only graduated in the last couple of years and assumed that they would have been taught about them.

### 6.2 Designers’ need for knowledge

Here designers’ self-identified claimed need for knowledge is presented, firstly in terms of content, and then methods of delivering and displaying that information. This is used to both scrutinise the findings from the Preliminary Study in an attempt to enhance their reliability and to develop their credibility and meaning.
6.2.1 Information that designers need or want

6.2.1.1 Introduction to environmental labels

2M suggested a brief introduction to environmental labelling at the start of the Resource as well as FAQs:

‘What might be worth doing is just thinking like if you are a complete novice as to the environmental labelling stuff then just a “why?” section so just outline the benefits.’ (2M)

2M had experience of using labels (in current position within a design consultancy) and said that the client had provided most of the information and done most of the work. As a designer in a consultancy, 2M’s knowledge came almost entirely from the information provided in product specifications and design briefs from the client and 2M’s experience of finding information alone was low. This might be why 2M expressed that some designers would need to know basic information. This shows that in this case, the designer relied on being told what to do; whereas SMEs with in-house designers may not have this external source of knowledge. It would be hard for a person not familiar with a product to know the standards. However, 3M (who worked in the same consultancy as 2M) could not even give a definition of environmental labels. 3M would have to be told what was needed; they wouldn’t even know where to check what was needed. So in-house designers might know if a label is relevant and use it again next time, but consultancies would potentially be learning afresh each time. Labels might result in less innovation because designers stick to what they know will achieve it. Designer 2M said that following label criteria could stifle innovation; it was also pointed out that labelling criteria cannot keep up with technical advances and market innovations.

6.2.1.2 Basic key information about each environmental label and scheme
The key information that participants in the Preliminary Study indicated that they needed included label type, whether the label is compulsory, the costs associated with applying for and/or using the label, and where the label is relevant. All of this information was presented in ‘DELR’ on an ‘Overview of Label’ page for each label, along with links to further information about the label specifically for designers and manufactures, and hyperlink to organisation responsible for awarding the label. Speaking about this key information 2M said:

‘There is obviously further information out there, this is just a quick synopsis, and you can probably make your decision as to whether or not you want to go further just on these four points.’ (2M)

6.2.1.3 Financial

Many of the designers stressed the significance of highlighting of the costs involved with a specific label.

‘Having the membership costs on there is really useful.’ (1N)

‘You have got costs and so on, this is stuff I wouldn’t have even thought about.’ (1A)

1A looked to the Case Studies feature for specific financial information such as the investment required or savings as a percentage of turnover or of profit, as they would be much more inclined to read because this is something they have not read elsewhere. The majority stated that facts about economic savings and profits were the most important. Partly this was because it could be easily understood (which is not the case with other types of information such as a percentage of CO2 saved), and also because it was felt that it would be the most powerful aspect in persuading others in the company to consider using labels. For example:

‘I think that is really good having how much it saved because I can see the company getting on board with that.’ (1M)

Financial information was also important because of a misconception many design companies seem to have that anything “eco” or “sustainable” would cost
more, as Designer 1J indicated when explaining their previous employer considered that anything sustainable would result in a cost to them. Resultantly, any evidence would help designers to show what the application of a label could achieve. However, as was pointed out by Designer 1A, figures are only impressive when in context and in relation to other factors, for example savings set against investment. In the feedback survey, 1A continued,

‘I need facts and figures relating to costs/savings to enable designers to promote eco-labelling to company directors! Designers will only be able to make use of this tool if allowed to by non-designing decision makers.’ (1A)

6.2.1.4 Compulsory or voluntary

Another piece of key information designers picked out was the indication whether a label is compulsory or not. Designers considered the reasoning behind this important:

‘I was going to say I want to know why it is compulsory, (...) you have got it here in the body of the text, although again in terms of speed I would pick that out. So for example in here “The Green Dot scheme is covered under the European Packaging and Packaging Waste Directive” that’s great so that is very credible, you have told me I need it and you have told me why. I would pick the title of that directive out.’ (1A)

6.2.1.5 Information about LCA if required for label

Several designers requested that the Resource include information about LCA such as an explanation of its purpose, which aspects of a product need to be assessed during an LCA for a specific label (e.g. carbon dioxide emissions for the Carbon Reduction Label). They would also require links to external sources for more detailed information and access to various software packages.
designed to assist with LCA of a product. Another solution may be to integrate environmental label information into existing LCA tools which designers are already familiar with using.

6.2.1.6 Examples of other companies and designers using labels

A number of designers indicated that seeing a big brand company using environmental labels was encouraging; they looked to successful manufacturers to "lead the way":

‘And it says that they [company in the case study] have retained the use of their label, maybe slightly more detail on how they have retained it. I mean is it because they are a massive name it does the Carbon Trust good to have it on Walkers? (1M)

‘It’s a good thing I’m sure to have it but when there is a fee involved and stuff and no doubt regulations to comply to, it would be good to know, right: What are the results of it?; How has it succeeded in the market place so far?; Are there any surveys been done that shows that consumers look out for it and choose one product over the other one because it has got that label? So some kind of success stories if you like, I think you had a case studies thing in the past but maybe if you could get to that, so maybe a case studies link with specific regard to that label might be useful. (2M)

They also wanted case studies to offer contextualising information on the meanings behind the facts and figures surrounding environmental label use, such as amount of energy saved;

[Dyson Airblade case study] ‘I don’t know what a conventional hand-dryer emits so it is nice to compare it to television but I would also compare it to your average one [hand-dryer] that you get in a normal gents [toilets] because if that might be roughly the same or
it might be ten-times [better], I don’t know because I’ve got no qualification for it.’ (2M)

Other convincing yet factual information that was identified as needed by designers included to be provided with real life examples of designers going through their design process and dealing with labels throughout. This was anticipated to feature details of the desired label in the design brief, the process of application, any external testing or internal verification required for the product in order to achieve the desired label, limitations and timescales. Again this would be from the designer’s perspective. However, participants understood why this depth of information is not generally available; companies want to retain their advantage in the market place and this may be affected by making the results of their efforts available to competitors.

6.2.2 When to consider labels

There was no consensus as to which stage of the design process that assistance would prove most beneficial, which this section will explore.

6.2.2.1 Before the Design Process (BDP)

Assistance before the start of the design process was considered most beneficial for those without previous experience of applying a label to a product.

‘I think that before designing would probably be the most essential for people who have not had experience of it before. That is definitely useful.’ (1H)

Most importantly 3M suggested that information about labels may be more useful at the beginning of the PDP as they could be incorporated with other client requirements or desires in the design brief; subsequently designers can aim to meet that specification and check that at the end of the design process. This does at least indicate 3M was informed about the place of labelling
processes in the PDP. Other designers recognised that having the criteria of the label in their mind (and in the design brief) would mean that they can ensure the product satisfies the label criteria:

‘I think before designing is always quite a good one so you can get an understanding of where you are before you get to it rather than designing something and then having to retro-fit something onto it.’

(1K)

Designer 1L appears to stress the potential importance of knowing information about what would be required to obtain all labels:

‘Yeah I think that’s really important to know what you have to do to get all the labels.’ (1L)

However, this may be a little naive of 1L as environmental labels are not simply a set list of achievements or prizes that can be gained through jumping through the most hoops.

However, getting designers to consider this on all products could be an issue, as suggested by 1H: ‘That would be something I would look for before anything else if designing a sustainable product; that is where I would go’ (1H). The implication is that it would not be used if not designing a “sustainable product”, suggesting that a specific decision has to be made, in 1H’s design processes, to design a sustainable product.

1M pointed out that the desired label would determine when assistance would be required. For example, labels based on an LCA would involve consideration from the setting of the design brief, others from the design stage onwards such as selecting and sourcing materials to lower carbon footprint, and some would come after the design is complete such as a declaration of the recycled content of a product. Another issue is the other pressures on designers at the start of the design process e.g. time, cost, and limitations of design brief, as well as the usual things they have to consider.

‘At the start of the [design] process I would say to be honest that I would be more worried about the product so I will be making sure
that it’s in terms of minimising materials, and the number of parts, and that sort of thing that will be. My focus will be on design for assembly and design for manufacture and cost that I am trying to keep that down for. So at the start of the [design] process I probably wouldn’t be thinking about labelling stuff.’ (2M)

6.2.2.2 During the Design Process (DDP)

During the Design Process was highlighted by some designers as being the most beneficial time for assistance. 2M said,

‘I think this has got to be during the design process to be honest because after completing presumably you are pretty much done.’

(2M)

The Compliance Checker feature allowed designers to input details about the product they were designing or had already designed and it revealed which labels the product would be qualified for. The results would instantly update automatically every time an amendment to the product was inputted, such as changing a material. This proved to be a very popular idea with many of the designers, although again some of the designers did come across as not fully appreciating or understanding the process of ensuring a product conforms to the criteria required for some labels. For examples:

‘That is useful, “Real-time compliance” because it might be somewhere down the line that you decided that you wanted to have a label and you didn’t want to go all the way back to the drawing board.’ (1M)

‘I guess if I could just, if I completed like a questionnaire then on the coffee maker [sample product] and it is stuff like what groups of materials are you using?; what size is it?; what are the packaging implications?; where is it going to be made? That sort of thing, and then it just ticks off and filters through basically that would be quite cool. And if it said something like ‘if you made this
polyethylene instead of polypropylene then you can use this label and it is better for these reasons then that is probably good.’ (2M)

In contrast, 4M did not think any assistance would be required during the design of the product as information about labelling guidelines and awarding criteria should be in the design brief.

6.2.2.3 After Design Process (ADP)

Assistance following completion of the design process was considered to be the least intrusive. 1M said this would be the most useful time to consider labels as they would be more likely to be applied to help with the marketing of the product. As 3M put it: ‘You kind of have got it all done and you just want to slap a label on to inform the user’. 3M went on to explain that many of the considerations and decisions during the design of a product: ‘...are not done for the sake of a label, they are done for the product as an entity so you want to minimise materials and cost and energy use and weight to ship it and obviously that goes onto the label eventually but it is not because of the label you do it, you do it for other reasons’ (3M). However, this raised concerns that a reliance on only considering labelling criteria after a product has been finalised or even manufactured would mean restrictions in which labels could be applied and a question over what benefits a label could potentially bring to a product. It raises concerns; do some designers just think it is something you do as an after-thought? Is it just labelling for marketing purposes? Are they suggesting that they might not actually change their practices?

This concern about designers being naive about the process of applying an environmental label might be enhanced by the fact that very few designers appeared concerned or valued information offered to them about the length of time required for a product to be awarded a label. As the literature has shown, depending on the label, the certification process can be anywhere from 1-2 days to 1-2 years.
6.2.2.4 Ability to download labels to use

Continuing on this idea of designers not understanding the application process required for many labels, a link to download high quality image files of free to use labels (such as the Tidyman) proved to be very popular. They only appeared on slides for labels that are free to use and self-certify. Users requested more choice of file types to download. One idea suggested for further improvement would be to provide a selection of ‘stock’ or ‘standardised’ label images for designers to use or adapt to encourage more uniformity across the market; for instance using WRAP symbols on packaging as well as or instead of the Universal recycling Symbol (also known as the mobius loop). Designers indicated they wanted this, but it does throw up the potential for these labels to be misused and contribute towards greenwashing.

Similarly, the sub-feature of Self-Declaration Claims assisted designers with making self-declaration claims about their product. It informed them of the correct ways to use these labels and the type of information they may wish to convey to consumers. This attempted to eliminate greenwashing, prevent misinformation and the misuse of labels. Feedback on this idea was generally positive, especially from those designers who realised that self-declaration claims can often be made easily and without cost. 1B said that this would help to add value to a product and help to improve sales through marketing.

This could be further evidence of the time pressures that designers feel they are under, by them apparently being enthusiastic about the potentially “quick and easy” method of self-declaration (Type II) environmental labelling?

6.2.2.5 Which labels are relevant to a particular product?

A significant request to improve the Resource that was suggested by designers, including 1L, was to allow users to produce a “shopping list” of labels they require.
‘What would be quite nice is if you could click on here [Label images?] and it could make you like a shopping list of things you had to do. So if you were designing you could do multiple things so if you had like to do some speakers you wanted plywood and then you wanted some plastic and you wanted, say five different materials, then you could add them, like a little plastic symbol here, you could add it. So you could add all these labels up and print out like a check-list.’ (1L)

1L raises questions about the place labels can have in designers’ work, requesting simple checklist information or a ‘to do’ list. 1L was young and relatively inexperienced as a designer (in terms of time practicing as a professional designer – although they had worked in several design consultancies and in-house design teams) so perhaps understood less about the design processes required or the practical approach to design.

### 6.2.3 Where to find information on labels

When asked, every designer in the Preliminary and Main Studies said that they would use the internet to search for information on labels. Alongside Google, Wikipedia and BSI websites, designers indicated that they would visit government websites, .orgs, that are seen as trustworthy because they belong to leading authorities on a subject. The Cambridge Engineering Selector software was offered as a potentially useful source because ‘it tells you a lot about in terms of production as well mainly because of the use and the kind of things that go into things, also processes’ (3M). Others stated that they would ask experienced colleagues. Surprisingly, there was no mention of the DEFRA website, despite DEFRA being responsible for award of EU Ecolabel and having several pages of their website dedicated to environmental labels. There was also no mention of websites of label awarding bodies, national or international directories of ecolabels (e.g. Ecolabel Index) or organisations promoting green design and manufacture (e.g. GreenSpec).
In terms of what the designers would be looking for when searching the internet, they would visit websites of organisations that they felt were authoritative or verifiable, as some felt that they would need to take the information on Wikipedia, for example, “with a pinch of salt” (2M). The importance of correct information was highlighted by 1A:

‘Obviously when you are printing 100,000 bits of packaging you don’t want to make an embarrassing mistake and use the wrong logo - something that is going to mislead consumers is going to get very expensive to replace. It is not just the cost of the packaging, it would be the cost of reworking the packaging on all the products.’ (1A)

Not only is incorrect information costly to remedy, it can have costs for a company’s reputation.

An additional method of finding information about a label which was discussed but not simulated in ‘DELR’ was a feature where a photograph could be uploaded and recognition software could identify it. This would enable designers to take a photo of a label that they did not recognise and potentially learn about whether it was relevant to them or their products.

### 6.2.4 Style of presentation of information on labels for designers

#### 6.2.4.1 Concise detailed information

Some designers in the Preliminary Study highlighted that the standards they have to work to are long and text-heavy, making them difficult to read and understand. Hence, the Resource was designed to include some slides that contained lots of blocks of text in order to replicate this. This elicited the response from some designers that if there was too much text in the information about a label, this could discourage designers (and others) from continuing their interest? One response to this was that these slides were too wordy:
‘I don’t know, maybe if it was a little more concise though. I mean just as a person like myself I just hate reading big lumps of text. I find it hard to take in because you get half way through and you are trying to link it through but perhaps that is just because I am a designer. And more of an infographic kind of think like the key words and stuff.’ (3M)

Designers said they preferred a concise, quick and easy information source so that they would know if a label is relevant and how it would affect their work. More images were offered as a way that the page of text could be broken up, with greater use of contextualisation and example.

6.2.4.2 **Highly visual**

3M suggested different ways of presenting or visualising the information such as combining multiple aspects of a product, for example materials and cost, and displaying the results in a graph or grid to show where things cross over and where the labels fall:

‘It’s quite OK looking at information in tables but if you can see how it all links together you might be able to make some more informed decisions’ (3M)

This is potentially very complex information to display. Although it may be difficult to understand complexities of the data in just a graph or grid, it could help as an introduction to the subject.

The use of images was also very popular, especially with highlighting labels which they were unaware of:

‘The images definitely help because I hadn’t seen the Blue Angel one and yet I thought I had seen them all before.’ (1H)

6.2.4.3 **Direct links to more detailed information**
Participants acknowledged that there were other sources external to the Resource where they could access more in-depth information. In the case of the ‘Material information’ feature, all understood the primary purpose of the feature was to make them aware of labels relevant to specific materials. An example of an external source suggested by 1L in the feedback survey was to have a link with the CES, a materials database. As a very recent graduate, 1L had been taught to use tools and resources to aid their work, for example, CES. More experienced designers mentioned that they have more developed familiarity with materials, ties to existing suppliers or that specific materials are mentioned in the brief. Designers’ context, position and existing knowledge provide complexity:

‘From a designer’s point of view I don’t think they’d [other designers] need to know any more than that. You don’t need a link to a website that then tells you all about the layout methods of plywood, it’s fairly well known and standard. But in terms of the compulsory and optional labels, that is quite a nice thing.’ (1K)

So 1K is saying that they already know about materials, but require additional knowledge on the labels that may be applied to those materials. Similarly, 1M wanted more detail as to why a label would be compulsory for a specific material and reasons why the alternative materials suggested would be superior.

6.2.4.4 **Unbiased, yet persuasive**

Designers stated in the Preliminary Study that they desired clear instructional factual information about labels rather than opinions about the use of labels. After looking at the ‘Material information’ slides 1A said they were pleasantly surprised as they had assumed the feature would try to “push” the use of environmental labelled materials onto the user.

Some designers asked for those beyond the basic facts, such as promoting the benefits of environmental labels to encourage uptake.
“Why should I put one on there?” might be another [question] that you want to put in here. Just maybe expand on that a little bit and say “look Phillips started putting them on in 2005 and in 2007 sales went [gestured upwards] and now it is the industry standard in terms of white goods that everyone has this on and there isn’t a washing machine priced above £300 that is not C rated [energy efficiency]”. I guess that is your Case Studies.’ (2M)

Others however were suspicious of information that they perceived as trying to “sell” labels or ecodesign to them. 1A said:

‘I don’t think I need to be [on the Case Studies features], the fact that I am even here [using the Resource] and I am even reading this kind of implies that I have already bought into environmental labelling, that I don’t need to be persuaded by it. It might be some interesting bedtime reading I guess and for other companies that might persuade them to start doing it [using labels].’ (1A)

6.2.4.5 Trustworthiness of information

As outlined in chapter 5, there was the Forum feature where designers and other professionals could share experiences about applying labels to products. Also there were opportunities for users to pose specific questions to an expert using the ‘Ask An Expert’ section. During the Main Testing of the resource only 1M selected to use the feature as part of their simulated use. This was a real surprise to the researcher as a forum had been a frequent suggestion during the Preliminary Study. 1M said that the description of the Forum on the Homepage should say that contents are monitored, to reassure users. Other solutions could be to have a Wikipedia-style review of answers before they are published, but this would take even longer and still not guarantee the accuracy of information. This concern about trusting information on forums was also expressed by 1M and 2M who said trust of information would be the main reason for not wanting a Wiki. This signifies the important issue of trusting information, as 2M put it:
'I guess it’s trusting the information. (...) if I am designing something for a client in a professional environment I wouldn’t really trust any of that information. But that is just my suspicion and that could be right or wrong.’ (2M)

A less obvious reason for a reluctance to use a forum is that some see forums as an inferior source of information and think of themselves as cheating if they need someone else to explain something:

‘Even though they [forums] are really useful, I don’t know if it is out of pride or what, but I always tend to go to them last just because the information is probably already there, you just have to find it.’

(1J)

Therefore if they have to resort to using a forum to find information, then designers may think that they are not doing their job properly. 1L wouldn’t use a forum to find information normally as they considered themself technically-minded and hence not in need of asking others for help. However, despite the negative opinions of forums outlined above, a number of designers admitted that they would actually rely on a forum. After each user had been asked to take a look at the Forum, other positive comments came forward about the feature and forums in general. 1B indicated that they would ‘probably would read other peoples’ responses but I probably wouldn’t post on it. But it is always useful to see how other people have dealt with problems’ and this was echoed by other users.

### 6.3 Motivation to find information about labels

Both the Preliminary and Main Studies identified that designers involved generally had low knowledge of labels and the process of applying them. Additionally, they raise questions about the motivation of designers to locate specific information. This included personal motivation and being instructed to as part of their design process. It was also equally important to discover why they would not seek information. This section presents findings relating to why
designers may or may not feel the need to find information about environmental labels, and how they would go about doing so. These are important in understanding the situations which users of the Resource could be in, what they would be looking for, and how to encourage them to access the Resource. For this reason every interview opened with these questions.

6.3.1 Reasons to find information about environmental labels

6.3.1.1 Required for product

Several designers including 1B, 1M and 3M said that they would look for information about labels if they felt it was a requirement for the product. For example:

‘If it was needed perhaps, so if it had to have this label on then obviously I would go and look for the information and try and find it and see what was appropriate but I wouldn’t do it for fun you could say. I think it would be done for a need if it was required.’ (3M)

When these designers were asked how they would know if a specific label was required for a certain product, the majority said that they rely on being told: ‘It would have to be mentioned. It wouldn’t be intuitively assumed’ (3M). They expected this information would be communicated to them at some point during the design process through the design brief, colleagues, fellow designers or directly by the client. 1M said that they would feel motivated to find information about environmental labels ‘If I had been briefed to’.

DH ‘So how would you know which labels have to be applied to a particular product? Do you rely on the client to tell you that?’

4M ‘I rely on other people that I work with knowing.’

6.3.1.2 Legislation and Directives
A few designers said that they are aware of an increasing number of directives and legislation concerned with various environmental aspects of products. Both national and international were anticipated to impact on the work of designers:

‘I think if all these directives come in that products need to be designed in a certain way you can’t go from nothing to having everything, there needs to be a stepping stone … as these WEEE Directives come in and as peoples’ [consumers] energy awareness comes up that these will be more sought after.’ (1K)

2B and 1A stated that they already conduct their own research into what labels are currently required for a product by researching ISO (International Standards Organisation) and BSI (British Standards Institute) standards. This was because they had products that had specific Standards requirements. 2B was asked why they would look for information about environmental labels, to which they replied:

‘Mainly obviously because one of the things I know the government are trying to push on us is “eco-friendly” products.’

(2B)

This choice of phrase is interesting. As mentioned before, 2B was an experienced designer and it suggests that they felt they had got thus far in their career without needing to know about eco/green principles. 2B was also cynical about forcing designers to be “eco-friendly”. Personal motivation could play a large role in knowledge, development and use of labels.

6.3.1.3 Influence of company

It was commonly indicated that designers would look into labels if their company had asked them to. For instance, designer 1M said that working for a different company may influence their decision to look for information about labels:

‘possibly if I was working for a very “eco-company” that was interested in sustainability and things like that’ (1M)
1H said they thought they would search for this information if their company requested them to work on a particular project:

‘I’ve never had any thoughts about finding out about labels or ecolabels... I’ve not really brushed with any sustainable design in any professional practice but I think definitely if I were to be asked to do a project on sustainable design or think of doing that then I would need to be looking for that...’ (1H)

6.3.1.4 Asked to use by client

Many designers said that they would have to be asked or instructed to specifically use or find information about environmental labels by their clients.

‘It is rare that we would, that the sort of optional labels to put on products – especially the ones that cost money – they [client] I think, it is more likely that a client in the know would ask us to put one on a part on the product as a marketing kind of thing for them to tick a box and say “we conform to this thing” and put the logo on the packaging.’ (4M)

Others also relied on the client to request labels. 2M said that even this would not make them look for information, instead relying on the client to have done the work to ensure the product will comply with the required label(s) in the past:

‘The client has done the majority of the investigations really (...) They managed the supply chain for it so they manage it getting it made out in China and also their marketing people and their, I guess management people, are the ones that are ensuring that everything is on there. So for me it’s kind of like I am just a third party that basically puts the label on there. (...) In terms of the process that you have to go through to get accredited for it and to make sure that it is all right, the client has done all that.’ (2M)

However, 2M did say that they had in the past checked regulations provided by the client for positioning of label on product:
‘I’ve done some stuff in terms of like the actual regulations in terms of the logo so like making sure it is the right size and the right colours and black on white and that sort of thing so real literal stuff really.’ (2M)

This suggests that some designers such as 2M appeared more concerned about the visual placement of labels on products and packaging rather than how using a particular label could influence the design of the product. This could be because they do not understand what is involved with different types of labels. The implications of this applying a label versus following the requirements will be discussed later.

In contrast, designers 1L and 1M said that they would look for information about labelling if they thought it would be used for marketing of the product:

‘If it was to benefit the product, so if it was to increase its market appeal.’ (1M)

‘I think it will be when you [the designer] are deciding who [are] the target markets.’ (1L)

Designer 1L was a recent graduate who was working in a small design team where they were actively involved in identifying potential gaps in the market for new products. Designer 1M was working in a consultancy and had input into the marketing of products they were designing for clients.

6.3.1.5 Seen on competitor’s product

A recurring theme throughout the testing of the Resource was the reliance that designers and companies had on seeing what their competitors are doing rather than taking steps to become market leaders or set precedents themselves. For example,

[The client asking for a specific label] ‘…is not quite how it works in our sector often. Let’s say we’ve seen it on a competitor’s product and we think “oh s**t, why haven’t we got that?” then I would
generally Google the name of it and look at the top thing that comes up.’ (1N)

1N indicates here that (s)he is unsure about the best place to find relevant information on environmental labels, but it does highlight the power of markets and competition to influence designers’ engaging with labels.

6.3.2 Reasons not to look for information on environmental labels

6.3.2.1 Assumption that labels are self-explanatory

In contrast to the above positive influences on motivation to seek information, one participant did not seem to share this urge to look up the meaning of a label they did not recognise or understand:

DH ‘Is there anything that would motivate you to want to find out information about environmental labels?’

2B ‘Erm, not really. So I mean I look at a lot of labelling as [being] quite self-explanatory and obviously seeing the labelling that is on it [points to a product].’

However, when they went on to explain what they thought various labels on a plastic bottle meant, they were not able to identify the type of plastic or what they should do with that information, and could not give the name of the label or a definitive meaning. They knew that some types of plastic are recyclable and some are not. While this may explain why some designers may not look for information about labels, again it raises concerns that correct information is not reaching designers. 2B was an older designer and also expressed scepticism about environmental issues.

6.3.2.2 Pressure of limited time to find and retrieve information
One of the main reasons cited by a number of designers for not accessing the Forum feature during the task analysis and observation was because of the time it takes to receive a response to a posted question.

‘I wouldn’t use the forum. I just want the decision then, I want something that is instant. Decision made, done, out the way.’ (4M)

This impatience appears to be a direct result of the time pressures that many of the designers highlighted they were under:

‘I can’t be bothered to wait long. If I have got a deadline I would rather work it out myself than sit there and wait for someone, especially if they get the wrong end of the stick and you have to converse again and again and again.’ (3M)

6.4 Other factors affecting implementation

This section explores possible factors for designers not implementing environmental labels through their work other than their lack of knowledge of labels and labelling schemes.

6.4.1 Commitment / support of whole company

Designers acknowledged that the steps necessary to attain certain environmental labels would require a big commitment and involve investment and risk, so it would be something the whole company would have to get behind. In light of this, 1A also pondered where designers fit in with this:

“Commit to reduce carbon emissions of product in future” – well as a designer that is not really for me to say because of the way in which this organisation operates for example the whole company would need to be on board with that.’ (1A)
Financial information was also important because of a misconception many design companies seem to have that anything “eco” or “sustainable” would cost more. Designer 1J spoke about how their previous employer considered anything sustainable would result in a cost to them, so any evidence would help designers to show what the application of a label could achieve, such as that presented in the Case Study feature of the Resource. However, as was pointed out by Designer 1A, figures are only impressive when in context and in relation to other factors, for example savings set against investment. In the feedback survey, 1A continued,

‘need facts and figures relating to costs/savings to enable designers to promote eco-labelling to company directors! designers will only be able to make use of this tool if allowed to by non-designing decision makers.’ (1A)

It is also important to ensure that manufacturers and suppliers are also aware and agree to comply with relevant labelling requirements. Otherwise the efforts of one could be in vain. This is neatly explained by 2M:

‘…I would, as a consultant, we would have to make sure that the manufacturer would be OK with doing it as well. So say I satisfied all the criteria through the design and I was like yeah that’s fine, I can meet the scheme requirements, I can pay the £275 - but then I went on this [the Resource] and I was like right, the manufacturer would have to pay £500. I would have to make the decision probably are they likely? Na they ain’t going to do that, and therefore it’s worth nothing. So I would look at both of these as a designer. Don’t just think of it as only the manufacturer is going to look at the impact on the manufacturer.’ (2M)

1A explained how this could be an issue even for companies who specify particular requirements to their manufacturer:

‘Again, in our instance, it is not our manufacturer that would do those things, it would be us on behalf of our manufacturer because in the Far East they are probably 10 years behind I would say in
terms of their procedures and their environmental policies and so on. So they wouldn’t have the time or the inclination, even if we really specified it and asked them to do it for us they still wouldn’t. So we would have to do that part on behalf of the manufacturer.’

(1A)

Where a product is not manufactured by the design company, these steps may have to be taken beforehand by the designer, and then information specified to the manufacturer. So there may be little point in designers making decisions based on acquiring a specific label if the supplier or manufacturer ignores them and makes it their usual way, meaning a label might not be able to be awarded. Although designers work in teams which include other practitioners responsible for aspects such as sourcing materials, designers in Company H said they still had involvement in the manufacturing stage of the PDP.

6.4.2 Specified in design brief

If we compare this to designers who felt that labels would be specified in the brief, we might make some comments about the place of designers in the PDP, their influence over it and ability to influence those who set briefs, and the knowledge designers seek out or feel responsibility for. It is concerning that 1A, who claimed to already search for information and has responsibility, was still surprised at what he/she didn’t know. 2B, who had label and other requirements stipulated to them in the brief, didn’t feel like it was necessary to find information on labels. However, 2B’s colleague 1B did look for information but was occasionally left misunderstanding, as for example we saw in their Walkers crisps example and in looking for CE information:

‘I was looking at the CE Mark on various searches even though I have read a lot about it, I still didn’t know [until talking to you today] that it also had environmental criteria. That’s not very good then is it?’ (1B)

One said that designers rely on the brief to know what the outcome is meant to be.
‘Often designers don’t know where to start when they have to design a product – what standards they want you to meet. This would be good.’ (2B)

2B might say this because they are used to being told what to do regarding compulsory labels and standards.

**6.4.3 Position/influence of designers within company and the PDP**

1N pointed out that designers are not the decision makers:

‘You say about designers but designers aren’t the decision makers so often it will be the brief writer or specifier… Joined-up initial thinking is the key because most of the things [labels] you can’t get after, there is going to be something which makes the product have to be changed even if it is changing one material for another, different paint finish. If you’re not doing it from the start you haven’t got a chance… You can’t exceed the specification… you can’t say “what about the environmental impact?” as a designer.’ (1N)

They followed this up by also saying that a designer would have to make the case to others, specifically marketers and those who set the design brief. This was echoed by 1B who appeared to indicate that they would feel at least partly responsible for educating colleagues about labels and encouraging their use:

‘That would be useful. It’s useful to know that definition, to explain to colleagues in other departments the importance of [labelling] because again it helps with sales and helps with marketing.’ (1B)

This information about labels would be useful to others in their company such as sales and marketing practitioners as they could then explain to clients and customers which labels and/or environmental claims can be made about a product. This might help towards generating orders or winning contracts:

“It would be quite useful for our customers if they could know what they could display about our products (...) they may want to know
what claims they can make about their product and we can direct them to a resource for that then that may help them.” (1N)

So both 1B and 1N are saying that although they do not have direct input into the design brief, they still feel that they could and/or should make the case to others about including labels in the design brief. They acknowledged that this was not easy, but having information about labels was perceived as important from the perspective of having to justify design decisions to others within the company, especially if those decisions involve changes from what is set in the brief or cost money.

An important point was that the majority of participants recognised that labelling was not something a designer could do alone within a company. It requires the involvement and co-operation of other practitioners in the PDP:

‘Some designers might want more detail (…) to get to the level of detail that might be required for a sellable product or release it to the market you’d need a few people working on it.’ (1H)

This suggests that any Resource aimed primarily at designers may also need to influence other people in the design process in order to make an impact. In particular, a number of participants (including 2M, 4M and 1N) indicated that the Resource could or would also need to present information for marketers:

‘…it’s probably marketers within companies who need to be exposed to the labels to really drive the use of them within organisations rather than the designers themselves because it is the marketers that have the power to say “I want to put this label on this product that we are doing”.’ (1N)

2M said that if the Resource were to convince marketers it would need to include information on sales and consumer confidence for each label. This would be a lot of information to provide that designers may not require, and much of this information is already available in existing resources such as the subscription section of the Ecolabel Index PRO website (as described in Chapter 2).
Designers 2M and 4M (who both currently work in a consultancy but have previous experience of working as an in-house designer) suggested that the relationship between a consultancy and a client will be different to an in-house team. A consultancy may be listened to more by their client. However, 2M suggested they needed basic information and as they might not know about a specific label, this communication might not happen.

‘If you are a consultant you could go back [to the client] and say that you could achieve the Ecoflower for this product because you are trying to do a sustainable product we feel that this is possible. So yeah in that way.’ (4M)

6.4.4 Designers are unconvinced about benefits of environmental labels?

In creating the Resource, the researcher tried to strike a balance between factual information and positive promotion of the advantages of applying labels. This was for all labelling in general as well as individual schemes. There were efforts to avoid promoting one label over another. One or two participants questioned the balance, finding the Resource too impartial:

“Presumably with this website you want people to put environmental labels on stuff because it is, you know, you are trying almost to entice them to do it so really play on that a little bit more. I appreciate that it is a resource of facts and everything else but yeah highlight the advantage of having them a little bit more prominently.” (2M)

2M had expected to leave the Resource feeling that they simply had to pay attention to environmental labels. As said in chapter 3, the researcher was concerned not to push greenness or appear biased towards environmental labels. 2M’s comments suggest that some designers don’t consider caring about environmental labels to be part of their job, and that 2M felt it was the researcher’s or the Resource’s job to convince them of it. Therefore, this
designer may not feel the need to inform or persuade others in the company about the advantages of using environmental labels.

However, the impartial factual stance of the Resource was valued by several other designers, saying it made it appear more trustworthy. If it had been more biased or “pro-labels” then designers may have assumed that negative aspects of labelling had been ignored and they become overly suspicious. 1A suggested that the benefits from using labels may be seen as only possibilities and not certainties; hence, can be seen as opinion:

‘… maybe the overview at the beginning of every label should be a one-lined thing “this is what it does”, then you can go onto tell me about the benefits and if I don’t want to read the benefits I don’t have to. The chances are the fact that I am here already and even entertaining the idea of this in part I am already on board with it, although I understand that not everyone will be and that some people will want to read about the benefits, but maybe by separating those out it might help a little bit.’ (1A)

6.4.5 Perceived consumer awareness

Highlighting the extent to which consumers are being educated about environmental labels was suggested as a valid aspect of encouraging their use among designers. 1N pointed out that this could include advertisement campaigns around labels, new labels on products, ratings, sales of labelled products, or reviews of labelled products. Information about consumers could be offered, such as consumer confidence, and recognition of labels. Potential sources of this information include consumer groups such as Which? (www.which.co.uk) and sales figures from, for instance, Nielsen (www.nielsen.com). 1L discussed this in a way which reflects their involvement in the setting of the design brief:

‘One thing I would have is the effect on the consumer, so maybe say why it would be good to have it on your product because if I
was designing a washing machine then I would want to know that that label was going to have some positive effect in the marketing. If there was a bullet point maybe at the start saying “98% of consumers asked thought that the product with this on gave them a better or higher trust in the product” then I would think OK and they might trust my product more and my branding more. If people look at the label and think “I don’t really care if it is Energy Saving Trust” then I wouldn’t want it on.’ (1L)

1K indicated that marketers may become more interested ‘as people’s [consumers’] energy awareness comes up’. 1J suggested that designers are often already aware and that increasing visibility of labels would help others, including consumers, to learn more. 1J was a more recently educated designer (less than two years professional experience) and clearly already had knowledge and applied it. They perhaps made assumptions about other designers. On this point, 1N suggested that it is the responsibility of companies who produce and market products to educate consumers, not the labelling schemes. If designers cannot convince colleagues or clients then how can they convince consumers? They considered that the Resource could have a section covering recent consumer awareness schemes or campaigns. Similarly, they requested information concerning industry trends:

“What are the industry trends that we should be in? What are our competitors already doing? [Use this] as a benchmark.” (1N)

However, 4A reflected that there might be reluctance by many to be market leaders when it comes to labelling, despite many boasting they are market leaders in their sector.

**6.5 Conclusions**

The aim of the Main Study was to use the Resource to elicit further discussion with industrial designers about their knowledge of labels, their use of labels, and
factors affecting implementation. The Main Study contributes towards addressing research questions 2, 3, 4, 5 and 6. It provided the designer-participants with the information they asked for in the Preliminary Study concerning label types, schemes, criteria and the resultant potential impacts on their work, in the form of the Resource. Using the Resource, a number of themes came out of the interviews and other methods.

This Main Study built on the knowledge and understanding around labels that designers in the Preliminary Study indicated that they need. Information such as that presented in the Resource was considered beneficial to them and their work. A majority of participants said that if they were able to access this type of information regularly they would be able to use it to incorporate label criteria into their decision making. This highlights the complexity of labelling – information on labels is not easily understood, certainly on first reading. Designers may also be concerned about the number of labels or frequent changes in criteria that require staying up-to-date.

The study also indicates that designers need to be motivated, or perhaps instructed, to find information about environmental labels. The participants felt that they had responsibility to convince others in their companies that using labels can be beneficial. Some, as a result of using the Resource, suggested that they felt encouraged to communicate the benefits of labelling to those involved in the brief setting. Nevertheless, this still relies on designers to drive forward ecodesign and manufacture. A major obstacle to any resource aimed at designers is that information would also need to be aimed at marketers, brief setters or manufacturers. This is because they are all involved in the setting of the design brief, and labels need to be in the design brief at the start in order to be acted upon realistically. In addition, the Main Study indicated that there is some lack of understanding, or naivety, about the processes of applying labels, especially among inexperienced designers. Older or more experienced designers tended to be aware that the processes of applying labels would be similar in complexity or commitment to testing products to ensure compliance with standards.
What were more difficult to elicit were reasons why designers would feel motivated to search for the information without any prior prompting from the company or client. This raises the question why participants in the Preliminary Study claimed that they required this specific information presented in a personalised format that would be suitable for their effective use. The Main Study participants also importantly raised that other factors affect their capability to apply labels, such as their position with the company and a lack of commitment to environmental issues among colleagues. These designers would not be able to implement changes alone. For instance, information for designers might also need to be presented to convince others such as sales and marketing professionals. Hence, from an understanding in the Preliminary Study that designers need further knowledge in order to implement labels, the Main Study adds to this by suggesting the wide range of involvement and influence that designers have on the setting of the design brief and other professionals within their company and the connections here to implementing labels. The Main Study nevertheless left a question concerning companies and designers who have successfully applied labels and incorporated these ways of designing into their processes. Chapter 7 presents the case studies of three UK-based SMEs. Each company employs in-house designers who have applied environmental labels to their products. The thoughts, opinions and experiences of designers and other professionals within the three companies offer a comparison to the Preliminary Study and Main Study participants.
7 CASE STUDIES

This Chapter presents case studies of three UK-based SMEs with experience of applying environmental label(s) to their products. Each company employs in-house designers, whose thoughts, opinions and experiences of using environmental labels, together with those of other practitioners within the three companies, are compared to the previous findings. Within the emergent research design, and following the questions raised with the analysis of the Main Study data, case studies were added to the objective of the research project to understand further the experiences and situation of companies who have been successful in applying environmental labels to their products. The Chapter begins with an introduction and overview of each company. This is followed by the presentation of data obtained through interviews, social media outputs and the analysis of websites and product catalogues. Subsections begin with a question to focus attention on the key issue within.

7.1 Overview of Case Study companies

Background information to each of the three case study companies is given here. Each requested to remain anonymous. Market sector, share and company size are offered in Table 7.1. Table 7.2 contains details about the professionals interviewed within each case study company.

7.1.1 Case Study Company P

Case Study Company P is a leading manufacturer of coffins and caskets who own production facilities in England with a total staff of approximately 100, including 2 in-house designers. Its primary market is the UK, but they trade internationally. Their focus on the environmental impacts of their activities has been an increasingly important part of the firm’s business strategy (including ecodesign). They have been accredited the ISO 14001 standard and obtained FSC accreditation for their production facilities. This focus on the environment is
a means to differentiate itself from its competitors, becoming the self-proclaimed market leader in the “green” coffin industry. These include producing products such as FSC certified coffins and caskets, fair trade coffins, and green services. In recent years Case Study Company P and their products have won several awards, including: ‘British Chambers of Commerce National Green Award’ and ‘The Sunday Times Best Green Companies’ award.

This case study focuses largely on their experiences working with the FSC and use of the FSC label on their products. It also looks at their experiences working with the Carbon Trust and becoming ISO 14001 accredited, and other labels used such as recycling symbols.

### 7.1.2 Case Study Company Q

Case Study Company Q design and manufacture various types of educational toys. They are based in England and employ 8 people, including 2 in-house designers. They develop their own product ranges and have licences for several brands. They sell mostly to independent and major toy retailers in the UK who stock their products. They also sell abroad in over 30 countries through their distribution network.

This case study is to focus on Case Study Company Q’s experiences of producing a range of wooden toys which carried the FSC logo (Type I-like) in 2010/11. Interviewees were also asked about use of other labels such as recycling symbols and the WEEE logo.

### 7.1.3 Case Study Company A

Case Study Company A design and manufacture a wide range of outdoor and camping equipment from rucksacks and microfiber towels, to drinks bottles and electronic mosquito devices. They employ approximately 40 people, including 3 in-house designers. Within the overall company, they have three different brands under which they market their goods. All of their products are sold through major retailers, mostly but not exclusively, in the UK.
This case study focuses on a project that Case Study Company A undertook in 2010 to design and produce a new range of “eco” products marketed with the assistance of a Type II (self-declaration) label. Interviewees were also asked about use of other labels such as recycling symbols and the WEEE logo.

<table>
<thead>
<tr>
<th>Company</th>
<th>Market / Industrial Sector</th>
<th>Main Products</th>
<th>Market Served</th>
<th>Size (approximate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company A</td>
<td>Outdoor &amp; camping products</td>
<td>Rucksacks, Towels, Drinks bottles, Electronic mosquito devices, etc.</td>
<td>B2B</td>
<td>40</td>
</tr>
<tr>
<td>Company P</td>
<td>Casket Manufacture</td>
<td>Design and manufacture of Coffins, Caskets, etc.</td>
<td>B2C, B2B</td>
<td>100</td>
</tr>
</tbody>
</table>

B2C = Business to Consumer, B2B = Business to Business

Table 7.1 UK Companies involved in Case Studies

<table>
<thead>
<tr>
<th>Company</th>
<th>Interviewee</th>
<th>Job Title</th>
<th>Design experience</th>
<th>University attended</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company A</td>
<td>1A</td>
<td>Product Designer</td>
<td>5 years</td>
<td>Loughborough University</td>
</tr>
<tr>
<td>Company A</td>
<td>4A</td>
<td>Product Designer</td>
<td>8 years</td>
<td>Brunel University</td>
</tr>
<tr>
<td>Company A</td>
<td>5A</td>
<td>Sales / Marketing</td>
<td>N/A</td>
<td>Oxford Brookes University</td>
</tr>
<tr>
<td>Company A</td>
<td>6A</td>
<td>Graphic Designer</td>
<td>4 Years</td>
<td>University of Huddersfield</td>
</tr>
<tr>
<td>Company P</td>
<td>1P</td>
<td>Creative Designer (product)</td>
<td>9 Years</td>
<td>London Metropolitan</td>
</tr>
<tr>
<td>Company P</td>
<td>2P</td>
<td>Creative Designer (product &amp; graphics)</td>
<td>3 Years</td>
<td>Bournemouth University</td>
</tr>
<tr>
<td>Company P</td>
<td>3P</td>
<td>Sales and Marketing Manager</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Company Q</td>
<td>1Q</td>
<td>Quality Assurance Manager and Product Designer</td>
<td>18 Years</td>
<td>Keele University</td>
</tr>
<tr>
<td>Company Q</td>
<td>2Q</td>
<td>Head of Product Development</td>
<td>20 Years</td>
<td>N/A</td>
</tr>
<tr>
<td>Company Q</td>
<td>3Q</td>
<td>Marketing Manager</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Table 7.2 List of interviewees from Case Study companies

7.2 Presence of environmental issues on company website

An analysis of each company website was conducted prior to interviewing designers and other practitioners within.
Case Study Company P was the only one of the three to feature information about the company’s considerations about the environmental impact of their business, and it was highly visible including on the home page. Their dedicated ‘Environment’ page includes information about what they have done to reduce their impact on the environment, including: ISO 14001 accreditation; all wood and wood effect materials sourced from FSC accredited sources and certified by the FSC as compliant; FSC accredited production facility; Carbon Trust Standard audited carbon emissions and found they are being reduced year on year, and in 2011 company was re-assessed and re-certified. It also explains their efforts to reduce their impact on the environment include: electricity (using “Green” energy tariff electricity, an reducing usage by 22% in the last 5 years); water (collection of rain water to use on site in toilets and vehicle washing, saving estimated 200,000 litres of mains water usage per year); heating (wood off cuts power the factory heating system); transport (company cars converted to LPG, encourage travel by public transport, operate a bike to work scheme); recycling waste (e.g. paper is shredded and used to fill pillows in coffins, professional collection of cardboard and metal waste for recycling).

Case Study Company P also offers information about the environmental initiatives they have introduced. The website also includes links to external sources of information about these awards and the environmental labels they are using. In contrast, it is of interest that no evidence could be found of either Case Study Companies A or Q ever having used an environmental label on their websites or product catalogues. Neither of their websites included any information about the environment or any company policies they may have connected to the environment.

Of the three companies it was only Company P that has an active social media presence on Twitter with over 700 tweets and almost 2,000 followers (November 2014) and Facebook with over 2,000 ‘Likes’ (November 2014). They appear to utilise these media for advertisement and also for connecting with past, current and potential consumers.
7.3 Structure of the design team

Company P had two creative product designers, one sales and marketing manager and one managing director. Company Q had two product designers, one sales and marketing director and one marketing manager. Company A had three product designers and one product manager, one graphic designer, one sales and marketing director, two marketing managers and two sales managers.

In Case Study Companies Q and A there was evidence of designers’ roles expanding beyond the design of the product in SMEs, for example:

‘Well let’s just say we are a small company so you are talking around 7 or 8 employees. And in terms of design and development, I’m actually the QA Manager as well as a Product Developer and I work closely with the Head of Product Development. So there is the two of us basically who work together on the design of the products and on sort of compliance.’ (1Q)

‘So it’s my responsibility to design all the new product and existing product from concept stage all the way through to manufacture and development and then quality control the product through the lifecycle time of it. So I draw up and brief all the products and then also have to get them manufactured in the Far East so there is a lot of Far East connection as well. That’s pretty much it.’ (4A)

This was not the case for the two designers in Case Study Company P who were just involved in design.

7.4 Brief setting

Are designers involved in and/or influence setting the design brief?

Designers are not involved in the setting of the design brief in Case Study Company P. They both said they feel as though they have little to no influence
over these mostly narrow design briefs. In contrast, both designers in Case Study Company Q are involved in the design brief setting and claim to have some input and influence over the contents of the briefs. These briefs are said to be fairly flexible in that designers can make suggestions of things to be amended or included even once a project has started. In Case Study Company A the product designers and the product manager are also involved in the production of the design brief, although their range of influence varies depending on the project, from little or none through to the greatest influence. They also claim to sometimes write the brief themselves:

‘Ok, we don't always receive briefs as such, its dependent on the product and the project. Sometimes the management have a very clear idea about what it is they want us to do, other times they don't, so they ask us to investigate the front end, sort of thing, to decide what the product should be and stuff like that. So to create our own brief but within given boundaries.’ (1A)

[About writing briefs vs. given a brief] ‘Yeah, it's a bit of a mixture, I'd say it's probably 50:50, it's kind of changed over the few years that I have been here but there used to be very strict and that yes we were given briefs and they were very strict briefs and we kind of realised that we were better at writing our own briefs and we were coming up with better work than we weren't so restricted. So now it's probably more like 60:40 writing my own briefs.’ (4A)

However, they were keen to stress that they were not as free or open as this may sound:

‘...management needs to know that there is going to be an outcome at the end of it. (...) they know that after six months we will have a product that they can sell.’ (1A)

And the risks associated with an open brief approach:

‘Because the more open the brief, the higher the risk of not delivering it on time or on budget and so on. So even when it is a fairly open-ended brief, you would generally look to your competitors and see what they do, because they would have
already gone through those hurdles of working and ironing out kinks and stuff” (1A)

Do labels feature in the design brief? Voluntary Type I-like labels, in this case the FSC label, are specified in the design briefs for Case Study Company P:

‘Well yes in terms of if we say to them [designers] we need to come up with a design for, if we are doing it for a coffin for instance, we would make sure we used FSC material in the design process.’ (3P)

Case Study Company P appeared to want every product they design to be able to be awarded an environmental label. Although this is not currently possible, they claim to be doing all they can:

‘The pressed panel coffins remain un-certified as the supplier who presses the board is not FSC accredited; however we still ensure the wood used is sustainable and correctly sourced.’ (Case Study Company P’s website)

Case Study Companies B and C did not include voluntary Type I-like environmental labels in their design briefs. However, Case Study Companies B and C did include mandatory labels required for products, such as ensuring the WEEE logo is applied to electronic products. All three Case Study Companies also used voluntary Type II labels to inform consumers about recycling of packaging, such as the universal recycling logo and resin identification codes, but are not considered an important part of the design brief.

7.5 Company decisions to use environmental labels

Who within the company suggested the use of environmental label(s)?
In Case Study Company P, the ideas and main driving force behind the use of labels and other environmental initiatives comes from the Managing Director (MD):

‘The owner of the company is very keen on that kind of environmental work. So he really pushed us towards that to get those kind of accreditations. But it ethically it is really what the company stands for.’ (3P)

For Case Study Company Q it was one of the designers who suggested the use of an environmental label, specifically the FSC label, on the range of wooden products they had begun working on. In Case Study Company A the brief setting team as a whole came up with the idea of using some form of environmental label. However, the actual label or even type of label was not suggested at that point and research in the options was conducted by the design team.

Who within the company decided on the use of environmental label(s)?
Within Case Study Company P all decisions are made by the board who set the design briefs, with the final say coming from the MD. These included the use of the FSC label on products, having production facilities accredited by the FSC, working with the Carbon Trust and being audited for the Carbon Trust Standard, and becoming ISO 14001 accredited. Designers are not included in this decision-making process. In contrast, in both Case Study Companies B and C the decisions to use the FSC label and a Type II self-declaration label respectively were agreed by the whole brief setting team, including designers, and were based on information obtained by both designers and the marketers.

Motivations for company decisions to use environmental label(s)
All three companies chose to use environmental labels primarily for marketing purposes. This being to make their product(s) appear more attractive to consumers, giving them a competitive advantage in the marketplace over rival products, and potentially to command a price premium. In addition to this, there were other anticipated benefits for companies to use an environmental label.
Case Study Company P also used labels to reinforce and develop the brand and the company’s reputation for being sensitive towards the environment. The marketing manager said about their use of labels ‘…ethically it is really what the company stands for’ (3P). It was the same reasoning behind their decisions to become ISO 14001 accredited and to start working with the Carbon Trust in 2008:

‘It was just another step towards our environmental credentials. To be honest with you we need to keep moving as to how we present ourselves and how we move forward. So it was just another element of that really.’ (3P)

Similarly, Case Study Company Q thought that using an environmental label on their new range of wooden toys would enhance the appeal and fit into perceived consumer opinions of the brand.

All three Case Study Companies also expressed that they thought some consumers would want to know environmental information about their specific products. 2P thought that many people think more about their impact on the environment as they reach the end of their lives, and this is reflected in the enquiries about and sales of their products. The designer who suggested the use of the FSC label in Case Study Company Q thought that environmental information about wooden products would be wanted by consumers:

‘I think we [the design team] sort of wanted to do some wooden toys and sort of hand-in-hand with that decision was “well, if they are going to be wooden toys, you know, consumers would want to see some sort of labelling with regards to those wooden products” because there seems to be a lot more awareness about sustainable forestry and things like that and we [the design team] chose FSC as what we thought was the most recognisable logo or system to support that really.’ (1Q)

5A said that Case Study Company A decided to use an environmental label on their new a range of products (including rucksacks), which were made with materials containing recycled content, because they believed that consumers would value their efforts in producing an “environmentally friendly” range. This
belief came from the assumption that their consumers have a stronger connection and appreciation of the environment because of the time they spend in the countryside hiking, cycling or mountaineering.

7.6 Knowledge about environmental labels

Where do they get the information from? In Case Study Company P the MD carries out his own initial investigations. He will then ask for some research to be done by sales and marketing such as looking for statistics on consumer recognition and understanding of label or scheme in consumer reports, gather opinions from customers who stock their products, and looking at information about sales of products already using that label or scheme. A lot of information comes from contacting the labelling organisation directly – in this case, the FSC.

Case Study Company Q also went directly to the FSC for all of their information. 1Q (Product Designer & QA Manager), who suggested the use of the FSC label, was aware of the label and its meaning from his experiences as a consumer seeing it on other wood and paper products. When asked why the company chose FSC over PEFC (similar label) both 1Q and 2Q said that they were not familiar with that label as designers or consumers. 3Q considered the FSC to be more established in the UK marketplace and would be better understood by consumers.

Designers in Case Study Company A were tasked with researching and finding suitable label(s) for the products they were to design. As part of this research they looked at what competitors were using on their products and also listen to what their retail customers wanted:

‘Generally we [members of the design team] are responsible for researching the market that we are designing for because we are quite a small company. The money required to invest in things such as official market research reports just isn’t there. So again,
looking at your competition, what they are doing, very heavily led by demand. Not only the end consumer but also our retailer customers who stock our products. We sell to highstreet shops and online retailers who then sell to the public. So it doesn't matter what Mr Smith on the highstreet wants, first and foremost it’s what does the retailer want, and normally they are the same thing.’ (1A)

Despite this approach, designers in Case Study Company A were experienced in finding important information for their products for themselves:

‘From receiving the brief I then go away and look at patterns and materials and technologies, chemical treatments and other stuff that we put on…’ (1A)

‘As a design team we need check for things like legal requirements for our products to pass standards so we get British Standards to check for compliance.’ (5A)

When did they get information about environmental label(s)?

Here there were some differences. Case Study Company P got all the information they needed before the formation of the design brief. This meant that from the start of the PDP the two designers knew what they had to do in order for the product to be certified at the end of it. Case Study Company A also did their research into which label to use before finalising the design brief. In contrast, Case Study Company Q only sought information once they had decided to go ahead with their range of products:

DH OK, did you approach the FSC before you started the project?

1Q Erm, well we actually started the project just to get an idea of whether we liked the products that we were developing, and once we were happy with the sort of concept we then approached FSC to understand what we would have to go through in terms of accreditation, etc., in order to be able to use their logo.
7.7 Labels and designers

What information did designers use during their PDP? Designers in Case Study Companies A and B used the information from the FSC. These designers claimed that they required no additional information during the PDP or for product certification as what the FSC had provided them with was sufficient. None of the designers interviewed in Case Study Company A said that they used any official sources of information during their PDP for the Type II self declaration claims and labels they used. They did not use sources of information on Type II labels that are available including ISO 14021 (this standard provides guidance on the terminology, symbols, testing and certification methodologies that these organisations should use), advice on DEFRA website, or others such as GreenSpec or Ecolabel Index. Instead, they relied mainly on looking at what competitors had used on their products. From this, they decided to use the Universal Recycling Symbol (also known as the Mobius Loop) with a number and percentage inside which is commonly accepted as representing the recycled content of the product, and also designed their own label based on others they had seen (see Figure 7.2).

Previous experience of using labels All designers interviewed said they had no professional experience of using voluntary Type I or Type I-like environmental labels (such as the FSC label) prior to the projects being focused on either in their current or previous jobs. Many of them said that they were already familiar with Type II self declaration labels such as the Universal Recycling Symbol and SPI Resin Identification Codes on product components and packaging. The all had at least some knowledge, and most had experience, of compulsory labels such as the WEEE logo being applied to products containing electronics.

Designers’ knowledge of labels now (after use) Since the use of the FSC label on products, the designers and marketers in Case Study Companies A and B had a better understanding about the labelling process and appreciated the requirements such as sourcing certified materials and either becoming or
using accredited manufacturers. In contrast, the designers in Case Study Company A did not appear to understand the implications of such, having only experience of using a self declaration label. Although they decided to source materials containing recycled content, they admitted that they had little or no guarantee as to the authenticity of this and the manufacturer they chose did not have to conform to the same environmental standards that would be required to become accredited, such as for something like the FSC scheme. They did not seem to appreciate the process of certification and time required for some labels, such as having to conduct an LCA for instance:

‘The process of labelling would be the last thing that you would do before the product went on the shelf if you like, and doing that would be arguably, predominantly to help clinch the sale.’ (1A)

Designer 1Q did have some knowledge or awareness of other labelling schemes which they had not used before:

‘We don’t use anything like the German Green Dot or anything like that because all of these require a licence fee so we don’t actually.’ (1Q)

1Q had carried out some research into labels, but suggests that the decision not to pay for the licence for the Green Dot was because of cost rather than not being relevant.

**Designers’ need for knowledge** In Case Study Company A, Designer 1A thought that they didn’t really need to know about labels in their company because they may not be applicable:

‘We recently launched our 75% recycled luggage range which includes recycled fabrics and so on, but I think that because we are largely a fabrics-led company I would assume that [environmental labels] would apply less to us than say a company that only dealt with injection moulded plastics.’ (1A)

However, designer 4A thought that they may need to know about them:
'Yeah I think I guess I need to know which sort of which labels just because there are quite a few eco-initiatives or labelling initiatives, and I guess I need to know which ones apply. Are any compulsory for certain end outcomes or depending what I am trying to achieve I guess? So I would need to know the legislation and the thinking behind them. And also what they all mean because I know about two! Yeah I guess I’m just quite naive about them, you know that they exist but I’ve never spent any time trying to look into them properly so I basically need a book about them to find out what is going on.' (4A)

Designers’ opinions of labels  The views and opinions expressed by designers in Case Study Company A also varied greatly, both in terms of what labels could achieve and how labels impact on their work.

‘My personal attitude towards it [environmental labelling] is that perhaps a proactive approach to using less in the first place would be better than to just label what you do use. However, that needs to be in balance against the commercial viability of packaging.’ (1A)

‘There are a lot more priorities for a designer than the eco-bit unfortunately, and it’s not a great situation but it’s what we have to do to survive. […] And it will also depend on what the company needs to do in terms of its investment to achieve that label. If it is going to take a lot of time and money then the chances are, especially at the moment given that no one else is doing it, arguably this award scheme is not an investment we would make.’ (1A)

Despite these opinions from 1A, in contrast 4A indicates a belief that labels would benefit the company:

DH  OK, do you think any form of environmental labelling would benefit the company?
4A Yeah definitely, especially in our market experience, sort of the travel products company and then obviously the environment and travel are quite closely linked so yeah, I think it would only boost peoples’ confidence in your company if they thought that you were accredited with whatever the scheme is. So yeah, absolutely. (4A)

Even within the same company and among designers who worked on the same project, designers have different perspectives on labels and their benefits to the company.

### 7.8 Labels and the PDP

Is the PDP for a labelled product different to the PDP for other products?

Case Study Company P said that all products are designed and manufactured in the same way, as they have been for long time, and a majority of their products are labelled. They also follow ecodesign principles through their work such as maximising use of resources, waste reduction, recycling, etc. As it says on their website:

> ‘Product Design – we have worked to redesign our coffins to focus on reducing waste, utilising raw materials and making use of new more eco friendly materials.’ (Company P website)

This contributes towards financial savings for the company and reduced environmental impact. It is also part of their ISO 14001 accreditation and Carbon Trust Standard commitments. Designers involved in the sourcing of materials said they have to do more than the “usual” aspects such as cost, material properties and aesthetics. They also need to ensure that materials are FSC certified and sourced from an accredited supplier. However, because they have been using certified materials for a long time now, they have already built up contacts and relationships with certified suppliers both in the UK and abroad.

There was no change to the PDP for Case Study Company Q, and it still involved typical aspects such as sourcing a materials supplier and a
manufacturer. The only difference was that these suppliers needed to be accredited manufacturers and materials from a certified source.

‘I don’t think we had to change the product from what we initially decided. No I wouldn’t say there were any changes in that regard, no.’ (1Q)

‘Fortunately, with them being wooden toys, the design of them was the same… We were confident that we could find a manufacturer in the Far East who could get the right FSC wood and manufacture them in the right ways so it would be given the FSC label.’ (2Q)

‘We chose an accredited manufacturer who sourced certified material for us so we didn’t have to worry about that. They know local suppliers and could deal with any issues so we agreed a single price per unit for the manufacture which included material costs.’ (3Q)

For Case Study Company A there were some issues in sourcing recycled materials in China. Their materials are sourced in China as well as manufactured there. However it meant they were reliant on suppliers or those who sourced the material telling the truth about the materials. As it was a small quantity that was purchased, the material was more expensive. Relationships with suppliers were important for Case Study Company A:

Finding good suppliers is very difficult. Building up relationships with suppliers takes a very long time so when you do have a very good one you will generally try and use them for as many things as is reasonable and in doing so you can end up limiting your own product range because you are suiting it to that supplier. (1A)

As the materials were unfamiliar to the manufacturers, they spent more time and money testing the strength and durability, producing samples to see how
the material would work in the machinery. This all involved extra work and changes to the PDP in comparison to usual processes for Company A.

### 7.9 Outcomes of using labels on products

**Product successes** Case Study Company P experienced and continue to enjoy success in the marketplace and make a profit. They consider themselves market leaders, with high sales. They could not quantify exactly how much of that success was down to the use of environmental labels:

*DH* When you first started using them was there a big difference or change in the way in which you went about the design or the marketing [of products]?

*3P* I think marketing-wise, in terms of pushing that to the front, definitely in terms of the ethical credentials of it, making sure we used it wherever it was possible to use.

**Product failings or disappointments** As mentioned earlier, Case Study Company P was disappointed that not all their products could be FSC certified because some of their products require manufacturing in an external production facility which has not been FSC accredited. Company Q experienced delay from starting the design process to the product being on the market because of the time required to find a new supplier and manufacturer. If the company had considered this at the start of the PDP, this process could have been shorter. They were also fortunate that they found a suitable manufacturer who had the capabilities to produce their products, so no revisions to the product were necessary.

Case Study Companies Q and A both experienced weaker than expected sales. Case Study Company Q did not blame this on the use of the label, instead saying that the market demand was not as big as anticipated. They also cited cost of label;
DH So you say that you have not done an FSC-accredited product for a while. After you did this one, was there any reasoning behind that?

1Q Well, the level of sales of these product wasn’t really sufficient to justify carrying on with a range of FSC products. Because obviously we had to pay a fee for FSC, plus there was the whole maintaining of the accreditation system, and the sales of the products just didn’t justify it so they were basically dropped from our range.

Case Study Company A thought that the label may have contributed directly towards the lower sales. However, they could not differentiate causes, such as the label itself, related claims through the advertisement campaign, the use of recycled materials in the product and a perception that this means lower quality, the price premium, or a bold change in colour schemes compared to those used on other products in their range. The firm did not have the resources to investigate the actual reasons why the product sales were low. One way they could have done this would have been to use market researchers to ask consumers their thoughts in stores at the display stand. Instead all they could do was ask retail managers in some of the stores that stocked their product as to their thoughts on why sales were lower than expected. However, these retailers were also unable to explain, hypothesising again on the higher costs, customer confusion about the claims and concerns with quality.

A closer look at some of the marketing for this product range from Case Study Company A is possible (Figures 7.1 and 7.2).
Figure 7.1 Advertisement poster for Case Study Company A’s recycled content range of “eco-products”

The actual recycled content was around 85%, not the advertised “75% recycled”, reported 1A. Other information on the poster includes “Packs that last a lifetime. Guaranteed”; 5A and 1A explained that this was made prominent on the promotional material as they felt the need to stress this guarantee in order to reassure consumers because of possible misconceptions about recycled content. They have this commitment on all their ranges of products they produce, but this guarantee is not advertised in the same way. Compared to other similar but non-recycled products, these had a price premium. The promotional material also refers to cost, but an environmental cost rather than economic, suggesting that a price increase is minor compared to taking care of the Earth.
Looking at a close up of the Type II self-declaration label on the poster, we can see the phrase “2% for the environment”. The meaning of this phrase is unclear in this context, as it does not refer to the recycled content of the products.

As they could not isolate a reason or be sure what had affected sales, the company decided to revert to their previous products as these were felt to be “safe”, in terms of certainty that they would sell. This might indicate a lack of ambition or innovation confidence in this company, but could be seen as the reality for SMEs unable to conduct market research to identify reasons for poor sales and consequently make changes to the product. 1A phrased it as a decision to stick with existing processes and chains:

‘So if you ignore [existing] suppliers, timescales and budgets, (…), then you wouldn’t have a business after a few months because you wouldn’t be putting out product which was wanted by people.’ (1A)

Additionally, 1A did not believe that labelling intrinsically offered any improvements to the products:

‘To improve the product? I don’t think it does improve the product at all, I think it improves your chances of selling it in the first place and I think it improves the feel good factor for the person buying it, but does any ecolabelling of any description improve a product? I’m not sure that it does.’ (1A)
4A said that they would like to include more environmental information to consumers about their products, but appeared to express disappointment at the approach taken with this product range, describing it as feeling that they had jumped on the “eco-bandwagon” and were guilty of greenwashing:

‘Yeah, well I would like to add it [environmental information] on ours more. So we’ve done a recycled ‘eco-range’ of products which is a bit greenwashed to be honest. It’s just jumping on the eco-bandwagon.’ (4A)

These perspectives might go some way to explaining why the commitment to the recycled product range had not continued. 1A and 4A suggest here that the company do not “buy in” to labelled or ecodesigned products and remain unconvinced or uncommitted following their bad experience. 4A’s comment does acknowledge that some of their labels were greenwashing, which can lead to consumer scepticism and mistrust.

7.10 Future use of labels based on experiences

Case Study Company P confirmed that they would continue to use labels on their products as they have enjoyed success. This remains the decision of the MD. Interviewees explained that environmental issues are something the MD both cares for passionately and believes are key in positioning the company in the marketplace. Because of this, the MD would be unlikely to decide not to use labels anymore. He may be influenced by sales figures or consumer views on a particular label or environmental issue, but he would more than likely just switch to a different label or focus on another environmental issue rather than cease.

Case Study Company Q’s decisions to use environmental labels in the future would depend on the perceived benefits in the marketplace for similar products. They do not see the benefits of using other Type I or Type I-like labels, but this is not based in tangible research - again, they rely on knowledge they have as consumers. These decisions would be made by the brief setting team.

DH  Do you think there is anything that could or would make you more inclined to going back to using the FSC in future?
1Q Erm, I mean it is difficult because I think the wooden toys category that we were involved with, there just wasn’t the uptake that we were hoping for so unless there was a particular demand from retailers for wooden toys I don’t think it is something we would go back to. I mean it is nothing really to do with FSC, it was more the demand for wooden toys per se.

3Q on the other hand suggested that a database of certified manufacturers would assist them in locating a supply chain that could lead to using labels again:

‘It would help us massively if the FSC had a list or database of companies in the Far East who are accredited to supply or manufacture stuff that can then be labelled. I don’t know if they have that now or not. Of course, we have now got some experience and a contact to go back to if needed.’ (3Q)

In Case Study Company A it would appear that both designers and the company itself have been scarred by what they consider to be an unsuccessful or negative experience. They considered it a risk not worth taking again. This decision was made by team who set the brief. Additionally designers were also wary of making environmental claims:

‘So we actively limit the amount we shout about it because of the worry that people would start to look into it further and then actually start to say that we are not very eco-friendly at all.’ (1A)

The project began with the Type II label in the brief, with the label and related factors considered the main selling point. As a first step into the green market it set the tone for their beliefs. A positive experience may have resulted in future use of more reputable labels such as Type I or Type I-like labels, and greater commitment. 1A explained why they initially chose to use a Type II label:

DH Would you not feel that the official schemes adds weight or trustworthiness to the claims rather than one that you could make yourself?
Quite possibly if any one given scheme grew big enough and recognisable enough to the end user to be able to make direct comparisons between certain products. But I feel that in the markets that we are in, our consumers don’t have to make that comparison because our competition aren’t doing what we are doing in terms of using recycled materials. So where we do use recycled materials we like to shout about it in our own way, which is why I am interested in knowing about recycled materials now to make recycled product but I am not interested in knowing how to label it according to any given standard.

It is suggested that many of their decisions, not just about labelling, are based in a reluctance to change because of the risks they perceive. They consider themselves a small player in the market and cannot afford to take the risks that they see bigger companies taking.

**7.11 Concluding comments**

The chapter has presented data from interviews, website and social media analysis from three companies, to offer case studies on the experiences of designers whose companies have successfully applied labels to their product(s). Of the three companies, one (Case Study Company P) had long-term experience of using several environmental labels including Type I-like, and working with an awarding body. This company continues to use labels. The second, Case Study Company Q, had used a Type I-like label on a product range. However, they no longer use that label, as production of that range ceased. The third, Case Study Company A, used a Type II self-declaration label on a product, but again ceased production of that product. These case studies reveal a combination of positive and negative aspects for these companies in the application and use of environmental labels with three different experiences. There are some similarities among the companies. At each, designers had low knowledge of labels and their meanings to begin with, and low understanding of what was required to apply a label, before using them. All three companies
required agreement from project leaders or brief setters in order to apply labels or incorporate them into the PDP. Following these decisions, Companies B and C had their designers research information on relevant labels; in Company A it was sales and marketing professionals who researched the information. Only in Case Study Company Q did a designer suggest the use of a label, and this happened once the PDP was underway. Case Study Company A designers were given responsibility for finding a suitable label to use. This suggests that designers in some companies are involved in design decisions relating to labels, in some cases being involved in setting the design brief, and have – or gain – knowledge on labels. Knowledge is primarily sourced directly from labelling organisations. The influence of some designers here on design briefs highlights potential opportunity for environmental labels to be considered as part of designers’ work. Some designers are able to promote ecodesign and environmental labels, although at other times these decisions are made by others in the company and information or instructions are given to designers. This offers consideration of the responsibility of designers to promote label use, and at which stage this might happen for successful label use.

Chapter 8 will discuss the findings of the Case Study chapter in relation to the outcomes from the Preliminary Study and Main Study, and wider literature. Each of these phases of the research project offer valuable themes in the implementation of labels by designers.
8 DISCUSSION

This chapter discusses the findings from the Preliminary Study, Main Study and Case Studies in relation to existing literature. It highlights major themes that have arisen through this research.

Within this research project, in the Preliminary Study, one of the major initial self-reported reasons industrial designers’ gave for not being able to implement environmental labels was a lack of information. They claimed that if they were given relevant and specific information about environmental labels, then they would be able to implement them into their work. However, in the Main Study wherein designers were presented with the information they claimed to require, in a format that was suggested by designers, it transpired that information alone was not going to enable them to implement environmental labels into their work directly. DELR prompted further conversations with designers about the need to have information with which they could convince others within the company to “get on board” or “buy into” the idea and see the potential benefits of environmental labels for their products and company. Therefore, decisions to take up environmental labels are not the industrial designers’ to make. The Case Studies showed that the company that enjoyed the most success from using environmental labels had a top-down company policy that engaged all professionals in the process. As acknowledged in Chapter 3, a learning effect could have taken place from one stage of the project to another. This would have affected six participants who were involved in multiple stages. However no learning effect was noted. Six survey respondents were interviewed in the Preliminary Study and/or Main Study. For these respondents, recognition of labels may have increased but not their understanding of label meaning or application process, unless they went away to research labels themselves in between completing the survey and being interviewed. None expressed having begun to use environmental labels in that time, nor did they demonstrate any specific knowledge of labelling processes. In the Case Studies, the focus was to learn about the participants’ previous experience of label use and their position or role in the company, which did not change.
Designers need to follow the label criteria or processes and have a role to play in ensuring that label criteria are met. Industrial designers could influence the decision whether to incorporate labels (in the PDP, design brief or company policy), depending on their place within the company. It was not always the responsibility of designers to drive label use or act as the company’s environmental champion. A crucial factor in designers’ use of labels is other professionals being involved in implementing labelling processes or criteria at the early stages of the PDP including highlighting it in the design brief. The cooperation of colleagues with designers throughout this application is also valuable: for instance, as marketers plan marketing strategies they will need awareness of the process and outcome in order to be effective. Knowledge of labels and labelling criteria are now important: designers might be the source of this knowledge but equally information might be given to designers by others who have done the research, especially if the top-down policy means that colleagues have researched labels before implementing them early in the PDP. It is not just designers that need to have knowledge, it is also not just designers who need to have the skills, experience, or enthusiasm. There are some further potential barriers for SMEs and their designers in implementing labels, including costs and time for certification, and a number of risks such as the uncertainties for product outcome, sales and consumer response. These themes will be expanded upon in this chapter, highlighting specifically the factors affecting designers’ implementation of labels and potential obstacles for SMEs. This chapter will discuss in order of importance the themes introduced here.

8.1 Designer’s position and influence within SMEs

Within the context of environmental labels, there are important considerations to be made on the factors affecting designers implementing labels: stipulation of label in the design brief; designers’ responsibility for the environment; the place of designers and other professionals in the PDP; and the investment of the company as a whole.
8.1.1 Designers and the design brief

It was clear from the literature that ecodesign (including working to label criteria) is most effective when implemented early in the PDP, including in the design brief (Bhamra and Lothhouse, 2007; Karlsson and Luttrop, 2006; Luttrop and Lagerstedt, 2006; Powell, n.d. cited in McDermott, 2007; Rubik, 2008; Seidel et al., 2008). The importance of the design brief in terms of its influence on designers and their design process appears paramount; this was stressed by a majority of participants in both in the Preliminary and Main Studies. This was also supported in the Case Studies, with 3P stating that designers are instructed through the design brief that a product will be awarded the FSC label and as such the designer must make sure they use appropriate materials. In this study all designer-participants worked to a design brief. Findings have indicated that if label use is not stipulated in the design brief, designers are unlikely to be able to implement them. Very few of the Preliminary Study interviewees reported being asked to include ecodesign in their design decisions. Main Study participant 1N stated that in their experience designers are not decision makers and would be unable to question environmental impacts.

In general, decision makers may be designers, and the study found a range of influences and involvement of designers in the production of the design brief. This was more likely if they were involved in the writing of the brief or fulfilling multiple roles such as marketing. In the survey, 24 of 44 respondents stated that they had involvement in writing the design brief, although only seven of them were always involved. In Companies A and Q, there was evidence of designers’ roles expanding beyond the design of the product. For instance, 1Q was the Quality Assurance (QA) manager as well as a product developer and 4A was involved in designing new and existing products from concept stage to manufacture; hence, they felt they would be able to influence the content of the design brief. Only 10 of the 24 survey respondents who were involved in brief writing, however, said they would consider environmental issues.
More often, the setting of the design brief is led by senior management and is typically influenced by the company’s strategic plan (Annable and Burns, 2009). While all designers have to respond to the design brief, it is not clear that designers are increasingly making choices about the environment (e.g. Bhamra and Lofthouse, 2007; Rubik, 2008). If it is included, sustainability can be seen as one of many factors on a design brief and as such it may not be given priority. Designers 1A and 2M suggested that there are a number of pressures on designers at the start of the process, such as time, costs and limitations of the brief, such that thoughts of applying an environmental label would be low on their priorities (also Richardson et al., 2005). This suggests that the application of an environmental label would have to be a requirement rather than just be desirable in the design brief to ensure designers took notice of it. It may be that only when prioritised earlier or by decision makers that environmental labels are effectively implemented. Suggesting that lack of commitment among designers is a cause of ecodesign failure (Lindahl, 2006) seems a little harsh given their ambiguous position and potential lack of influence at a strategic level or the preparation of briefs.

8.1.2 Designers’ responsibility for the environment

In reality many of the participants said they frequently had to work to a fixed or narrow brief where labels did not feature. Given the ambiguous position of designers in relation to the design brief, designers’ responsibility over environmental labels or being the environmental champion can be questioned. This is a notion that can be found in much previous literature (Lewis and Gertsakis, 2001; Post and Altman, 1994; Press and Cooper, 2003; Richardson et al., 2005; Simon et al., 2000). Simon et al. (2000) note that Designers may especially be expected to take this role in SMEs where there is no colleague who solely takes this role. Those who feel it is the responsibility of designers to push labels and ecodesign should remember that their ability to do so is directly affected by their involvement with the preparation of the design brief. In this study, many designer-participants felt that they could not make a difference and were disillusioned about this. Within one company there were differences
among the designers’ thoughts on responsibility: 1G said ‘it should be designers who push environmental design’ while 3G said designers were ‘no more responsible than other people in the general public’. Mackenzie’s (1991, p.8) idea that ‘designing with environmental impact in mind is ‘a matter of personal taste or individual moral responsibility’ still seems to be supported by some designers, such as 3G, two decades later. This indicates a great variation for designers.

**Promoting label use within companies**

In this study, some designers did feel that it was their responsibility to promote labels within their company. Designer 2A said that creating an ecodesigned product could give a “warm fuzzy feeling” because it represented a shift from the throwaway society. The more recently graduated they were, the more likely the designers were to have had some environmental design theory education. Designers may be considered as the source of information, skills, and theoretical and practical knowledge needed to implement ecodesign as it is perceived to be included in formal design education (Richardson et al., 2005). Education and technical expertise have been associated with environmental initiative (Lefebvre et al., 2003). In discussing information provided to designers about labels, 1B said that gaining knowledge about labels is useful for them in order to be able to convince others to use labels. Additionally, those designers who were involved in marketing felt it was their responsibility to promote labels.

It could be argued that interviewees’ personal low influence had an impact on the answers they gave about the responsibilities that they as individuals felt they had towards the environment and society. Generally, the designers who felt they had low responsibility were the designers who wanted to change things but did not feel confident doing so because there were hierarchies in their company and did not feel in a position to enact changes as an individual designer. As one participant said, if they were to refuse to make something, or even question its need, the company would still make the product but would get someone else to design it, and fire the refusing designer. 1Q, with two decades of experience, had suggested and initiated the use of the FSC label on an entire product range. It appears then that designers who have influence may be more
likely to have their suggestions implemented and designers’ ability to implement labels was affected by their position in their companies.

8.1.3 Place of designers and other professionals in the PDP

Designers’ position within the product design process and within their company (hierarchical relationships with colleagues, for instance) has a major influence on their capability to successfully implement ecodesign. As O’Connor and Cox (2005) and Rubik and Frank (2005) state, the path to successful implementation of ecodesign and environmental labels is complex and dependent on multiple actors and stakeholders. In relation to labels, professionals other than the designer have to be involved in the PDP or to be onboard at the start of the PDP and cooperate.

Case Study Company A’s marketers (brief setters) obtained all the information up front from the labelling organisation, and passed it to the designers in the design brief. Designers from this project and elsewhere have claimed that they are too low down in the PDP or company hierarchy to have an effect (Richardson et al., 2005). As noted in 8.1.1, where designers do have design brief influence, or other roles such as marketing and quality, they may be able to make greater changes. This has been noted as especially evident in SMEs (Annable and Burns, 2009). The importance of the engagement of other professionals in the design process must be recognised, as it affects the decision making of industrial designers and the outcome of their work (Deutz et al., 2013; Luttropp and Lagerstedt, 2006; Richardson et al., 2005).

In some cases the designer-participants shared examples of where their designed products had had a label applied after the design process, about which the designer had no prior knowledge or input. Evidently this meant that no improvements had been made to the product such as reductions of environmental impacts. This type of activity raises concerns about the possibility of companies applying voluntary Type I or Type I-like labels as it is difficult and potentially requires major changes to retrospectively apply these types to an
existing product. In contrast, there are examples of retrospective label application that are more successful: Company Q had started to design their range of wooden products and then decided to inquire about the requirements for the FSC label. Fortunately for them, the FSC did not require them to make any changes to the design of the product; the criteria of the label specified they needed to use certified materials in an accredited manufacturer – so this meant changes to materials and place of manufacture. While the FSC label criteria allowed for this retrospective application, it increased the time between the start of the project and the product going to market. If Company Q had included the criteria for the FSC label from the start of the PDP, this extra time would not have been needed.

When using the Resource the designers differentiated between information that was descriptive or persuasive in tone, and information that was instructional or factual, explaining that the former would be useful for convincing colleagues while the latter would be useful for themselves. Some participants felt that educating colleagues was their responsibility. Without an influential position in the company (or at least their perceived position) may suggest designers are unable to convince colleagues. In many cases they require to be instructed to find out about labels by a customer or senior colleague. A holistic approach to ecodesign and environmental labels would likely be beneficial. There are, then, implications here for companies.

8.1.4 Company Policy

Golden et al. (2010) and Tukker et al. (2001) have noted a need for commitment by senior management to these processes. A whole company approach might be needed. 8F said that ‘the individual is virtually powerless to change a company due to existing systems and hierarchies in place’. Case studies of manufacturing SMEs by Dangelico and Pujari (2010) identified a number of important drivers for green product development, some being a sense of social or ecological responsibility and values that reflect well on the company yet also may originate in personal commitment in management. The
coordination of information and resources is also highlighted by Dangelico and Pujari (2010), top-down management assisting with this. This was certainly the case with Company P, whose decisions to implement labelling on their products were driven by the Managing Director; he did this in order to enhance company reputation. Similarly, 3Q said that one reason for Company Q using environmental labels on some products was to develop the brand identity. Marketing professionals interviewed in Company Q thought that consumers would want to know environmental information about particular products, which drove their decision to apply for certification.

The most successful case study company – in terms of applying labels, gaining certification and sales – was Company P who had taken a top-down company policy approach to drive the application of environmental labels through environmentally friendly design and manufacture. Their designers were not involved in marketing and were provided the information they needed in order to design to labelling and certification requirements by marketing professionals who gained this information from the labelling organisations. This supports previous work that states that labelling relates to innovation and commitment throughout product development (Rubik et al., 2008).

8.2 Barriers for designers (and other professionals) within UK SMEs in relation to implementing environmental labels

There are wider issues affecting label implementation by designers and SMEs as a whole. This section will look at designers and other professionals within UK SMEs, with the following section going onto look at issues from a company perspective.

Low knowledge of designers
At times in this study, designer-participants expressed beliefs that suggest low knowledge of labels and processes. Some designers also claimed not to have access to any or enough suitable information about labels. In the Preliminary Study they demonstrated low knowledge, recognition of labels, their meaning
and the process of applying a label. A significant claim raised by designers in the Preliminary and Main Studies was the need to know more about environmental labels and how to use them. The Main Study reinforced this, to the point that designers in some cases indicated misinformation. They struggled to see how labels would affect them, at times indicating that labels were seen as something to “slap on” at the end. This apparent dismissal of labels, or at least lack of understanding about how conforming to labelling criteria could impact on their design decisions, could reveal a reason why the majority of designers involved in the study had not felt motivated to find information about labels in the past.

Companies may then require environmental specialists to oversee compliance and labelling. This was potentially significant because, as seen in section 8.1, it can be seen as designers’ responsibility to champion environmental labels. A number of these issues around designers’ knowledge can in some instances be a result of the low involvement of designers in design brief setting: they react to briefs and instructions provided by others, only seeking out information at that stage. During the research, specifically in the Main Study when using the Resource, designers responded well to the Forum feature. This feature enabled them to ask questions and engage in dialogue with other designers or experts in labelling. As a way to access and share knowledge, a forum represents a vital source of collaboration in a format familiar to designers in their professional and social lives. Although a few designers raised the issue of trust in free-to-access or crowd-sourced information such as in wikis, others highlighted the value of hearing from other designers with first-hand experience of applying labels and a subsequent ability to ask specific questions. The types of information that designers requested included case study style examples and suggestions. If a designer was unable to act as the champion or source of knowledge in their own company, or felt in need of convincing colleagues, they would be able to use a forum to access community and collaboration with environmental specialists (or experienced designers) elsewhere who could offer this role (Sala and Castellani, 2009). This can then give designers the confidence to promote label use proactively, not reactively.
Designers lacking motivation to find information

Some labels at each stage of the study had a very high awareness amongst designers, such as the WEEE logo and EU Energy label, likely due to their compulsory use on some products. If a label was required by a product (for example because of legislation), there was motivation among participants to seek out information. However, when questioned as to how they would know if it was to be required for a product, respondents said they would have to be told about it through the design brief, from colleagues, fellow designers or directly by the customers: it ‘would not be intuitively assumed’ (3M). Designers are increasingly aware of legislation and compulsory labelling schemes, but voluntary schemes may remain less known. Designers within Companies A, B, and Q admitted previously seeking information about labels during the design of a product. In contrast the designers in Company P were given the relevant information by their marketing departments, who in turn were prompted to gain this information from the labelling organisations by the Company MD. A small number of designers appeared more concerned with the visual placement of labels on their packaging than the processes of applying for labels and implementing them into their PDP. This potential naivety and low knowledge is concerning and has implications for the education and continuing professional development of designers. The Case Studies showed that although none of their designers had previous knowledge, as designers, of using labels before applying them to their products, they did have knowledge of some labels as consumers. Research with consumers has found that they also are often confused about label meanings or unaware of the different types (Fletcher and Downing, 2011b). Low knowledge may also affect chances of increased label use, and there have been specific concerns raised about low knowledge in SMEs. Knowledge has been seen as a crucial factor especially for SMEs (Annable and Burns, 2013; Dangelico and Pujari, 2009; Deutz et al., 2013; de Eyto et al., 2008; Hillary, 2004; Houe and Grabot, 2009), but the extent of label awareness among designers here has been a concern.

Designers’ capability to do ecodesign
Requests for further knowledge and information may have been masking another issue: being unable to do ecodesign or implement labels. Previous studies have reported that designers asked for assistance with ecodesign, such as through tools, resources, strategies and methods (de Eyto et al., 2008; Houe and Grabot, 2009; Kobayashi et al., 2005; Lofthouse, 2004; Michelini and Rizzoli, 2004). Seidel et al. (2006) concluded that in spite of the help indirectly provided by an environmental label, competence on environmental issues is necessary, and must be acquired during the process if not available at its beginning. Expertise in labels may be needed in order to make sense of the numerous rules they include (Houe and Grabot, 2009). A high proportion of the respondents indicated that they have at some point used resources in some aspect of their work, although it arose in the studies that these designers were not accessing existing information on labels, such as through Ecolabel Index, GreenSpec and UK government resources. The Main Study found that once designers were offered additional information (in the form of the Resource ‘DELR’), what designers claimed they could do with this knowledge was not as clear cut as had been suggested in the Preliminary Study. Once faced with such a resource (as in the Main Study), instead other issues were highlighted such as the influence of designers over others in their company, their place and influence within the company, or having time to commit. Having seen the processes, commitment and requirements to apply a label or become certified, through looking at the information in the Resource, designers in the Main Study gave further explanation about their need to convince colleagues, if they were to attempt application. Seeing that labels must be a part of decisions from the start of the PDP, that they sometimes require an LCA or time for testing and certification, or that supply chains need to be instructed or changed, these designers understood that labelling requires much more commitment than some originally thought. Exploring label information (in the Resource), designers reflected that in practice it would not be straightforward to incorporate into their work (similar to de Eyto et al., 2008). It is possible that claims to need information mask a deeper skills issue, and may explain the wide range of tools and resources available to designers.
8.3 Drivers and barriers for SMEs looking to use labels

There are barriers and limitations for SMEs more broadly in addition to those of individuals (designers and other professionals) discussed in 8.2. For SMEs, concerns might centre on the impact on their practices and profits (Miles et al, 1999). As Horne (2009) states, there may be as many dangers with environmental labelling as there are opportunities. Firstly, drivers for SMEs to implement label are recapped, before examining the risks SMEs may face.

8.3.1 Drivers

Reasons to choose environmental labelling have been linked often to profit (de Boer, 2003; Pedersen and Neergaard, 2006), legislation and government procurement requirements (Rubik et al., 2008; Seifert and Comas, 2012), efficiency savings (Golden et al., 2010), enhanced company profile (Dangelico and Pujari, 2010; Golden et al., 2010), market advantage (Bougherara et al., 2005; Hinckle, 2007) or competitive advantage (Morris, 1997; Rubik and Frankl, 2005). It is generally accepted that labels remain attractive to companies. The Case Studies in this project supported this, offering evidence of the advantages to companies of using labels. A number of these reasons for choosing labels were evident in Case Study Company P. Participants from this company said that labels have been crucial to their success in terms of sales and market share. This company was pro-ecodesign, seeing in it a competitive advantage or a unique selling point. Communicating their environmental credentials, including the use of labels, was their only marketing strategy; even though they offered a range of bespoke products and services, any communication about these activities were always related to the environment. Case Study Company P said that using labels had additional benefits including saving water and reducing carbon emissions (as part of working to meet standards for ISO140001 accreditation and the Carbon Trust audit), and were also valuable cost saving measures. Their success was greater than Companies A and Q’s largely because the decision to apply labels and seek accreditation were made at the start of the PDP and included in the design brief. Their guiding principle
was to reduce their negative environmental impact where possible, which appealed to customers. They were not guided by pressure from consumer groups or environmental campaign groups (Golden et al., 2010; Gulbrandsen, 2006).

8.3.2 Cost and time barriers

However, despite these apparent drivers for SMEs, there are barriers and uncertainties which are proving too much for many to consider it a risk worth taking. This section examines these barriers and how they might be mitigated.

The reviewed literature appears inconclusive about industry positions towards environmental labels and ecodesign. As Horne (2009, p.179) states, ‘the choice to overtly market products through eco-labels seems as often fraught with danger as it is with opportunity’. Looking at the reality expressed by the participants in the Preliminary and Main Studies, there can be multiple factors behind why some labels have low uptake. Almost all barriers that were raised in the project can be related to cost and time pressures. These were the two considerations all designers in the study cited as being at the forefront of their mind during their PDP.

**Investment in ecodesign/labels**

The perception for many of the participants was that any changes to the PDP would incur costs, at least in the short-term. Companies may absorb costs (including fees) related to product standards and certification programmes (Hickle, 2007) although there may be some who would have to pass on the costs to customers, including smaller manufacturers (Miles et al., 1999; Rubik et al., 2008). Some designers said that their company would be unlikely to use a label that had an upfront cost, because the cost would have to be passed onto the consumer, making it more expensive.

Despite the financial advantages to implementing an environmental label, the costs of certification have been acknowledged in the literature as potentially
prohibitively expensive for SMEs (Miles et al., 1999; Allan, 2000; Hinckle, 2007). SMEs have been noted as concerned specifically with the cost of third-party certification (UNEP, 2005). Designers in the Main Study indicated that their company would be unlikely to want to use a paid label, and certainly not without any realistic prospects of seeing an increase in sales and profits to justify the label cost. Case Study Companies P and Q said that cost of using the FSC label was not an issue or not prohibitive. These were the companies who had experience of using labels. However, this is not to say that there may be other costs associated with labels that are prohibitive. Those who had not used labels seemed to make an assumption that their company would be unlikely to entertain the idea of using a label that would have costs associated with it without any guarantees. Yet it has been noted in previous literature costs may be passed onto the consumer by smaller manufacturers (Miles et al., 1999; Rubik et al., 2008). There appears to be an impasse whereby some companies’ reluctance to engage with labels because of perceptions of cost-related risk suggests that they may struggle to reach a point where they are feel that labels are worthwhile.

As well as label registration fees, there are also other potential costs and time implications during the certification process required by third-party and/or label organisations. Golden et al. (2010) reported an average 4.33 months, although some are next day, others take one to two years. This can affect the design, manufacture and logistical stages (Hickle, 2007). Although their experiences were for safety compliance testing of their products, designers in Company B were aware of the time it can take, quoting anything up to and beyond six months. This has a knock-on impact on release of product into the marketplace, and any advantage may have been lost or fashions changed in fast-moving/evolving consumer preferences or seasons. In addition, the validity period on labels may be short, a difficulty for companies concerned with long term investment (Gallaraga Gallastegui, 2002).

Environmental demands are not the only priority and are balanced against other needs (Giudice et al., 2006; Luttropp and Lagerstedt, 2006; Richardson et al., 2005). If decisions are made to implement labels, costs may also be incurred in
carrying out market research into the success (or failure) of the product; this was so with Company A, who lacked the resources to research the reasons why their labelled products did not enjoy the success that had been anticipated. They hypothesised that customers might have been unwilling to pay extra for a labelled or recycled product. The increased costs of making changes to supply chain and manufacturing processes may make commitment to labelling risky for SMEs, especially in the short term (also Horne, 2009). Although stability of supply chain has been suggested as a driver for labelling (Seifert and Comas, 2012), some companies in this project found that they did not have stability as a result of pursuing a label. Company A’s existing manufacturer required additional time for testing how a new material from a new supplier would behave; Company Q had to find an accredited manufacturer in order to meet label certification criteria.

**Lack of time and impact on the early stages of the PDP**

Issues for the SME mean that staff may not have the time to research labels at the start of the PDP because they are likely to have tight deadlines to meet. The vast field of environmental labels does appear to have been a cause of frustration in companies, according to Seifert and Comas’ (2012) research. Larger companies are likely to have conducted extensive market research prior to the setting of the design brief, looking a year or more ahead (assuming the notion of the more agile SME is correct, Esty and Winston, 2006; Lefebvre et al., 2003). SME in-house designers (1A, 1N) in this project have revealed that they often look to what their larger competitors are currently offering for research and guidance as well as inspiration, as their company does not have the resources or ability to conduct research on the same scale as their rivals. As designers 1A and 2G said, this was also the process they used in terms of considering label use: questioning label worth if a larger competitor was not using it. Equally, if a large rival was using a specific label they would consider it and potentially follow suit or replicate with their own version. Although some literature argues that customer demand should be driving companies towards label use (for example, Rex and Baumann, 2006), none of the companies in the project suggested that they felt compelled to make changes based on consumer
demand. Without guarantees of increased sales the risks for SMEs making changes still remain.

**Getting information**

As Deutz et al. (2013) highlight, SMEs are less likely to have access to in-house support or paid-for services concerning education and information on ecodesign. Expertise is needed in labels in order to make sense of the numerous rules they include, according to Houe and Grabot (2009). SMEs face the problem of locating good quality advice and information (Hillary, 2004). Almost every designer in the Preliminary and Main Studies admitted looking for free information through internet search engines and using free-to-access sources of information such as Wikipedia. However, many were keen to stress that they did not rely on this information alone as it could not be trusted. When questioned why they used them in the first place, one of the common reasons given was the consistent format of the information, which allowed for both a quick overview and basic understanding, and then went onto offer detailed information and links to more reputable sources of information. The literature notes that SMEs are more likely to rely on free sources of information than subscriptions to industry information or in-house support (Deutz et al., 2013). Many of the designers in this project said that they and/or their company would be unlikely to use resources that had costs associated. Yet despite this, free-to-use sources of information such as those from government e.g. DEFRA and NGOs e.g. EcolabelIndex do not appear to be widely used, if at all. This could be because some information and guidance available, such as that in the form of standards, is accused in the literature of being difficult to understand for designers (Houe and Grabot, 2009). Relatedly, none of the Preliminary or Main Study companies had a recognised environmental champion whose role it would be to gain and disseminate information and promote label use at design brief stage.

**8.3.3 Uncertainties of outcomes and market response**
Literature suggests that consumer awareness of, and hence demand, for labelled products will be the driver behind industry changes (Galarraga Gallestegui, 2002; Golden et al., 2010; Mills and Schleich, 2010). Rex and Baumann (2006) also argued that consumers should be the active party in demanding “green” products. But once the product is ready to hit the shelves, there are uncertainties about how the market will react.

**Green consumers**

Companies understood that only some consumers would look for “greener” products. Even those looking for “greener” products will have other important factors to consider as well. The literature identifies a number of factors that intersect with labels to affect consumers’ purchasing decisions: products must be competitive on price and performance (Allen, 2000; Howard and Knepper, 2011; Seifert and Comas, 2012); functionality (Schmidt, 2009); and quality (Galarraga Gallestegui, 2002). Fletcher and Downing’s work (2011b) on UK consumers questions the popularity of labels and the extent to which consumers understand what a label means and different criteria have been highlighted as causing confusion for consumers (Edser, 2009; Galarraga Gallestegui, 2002; Golden et al., 2010; Schmidt, 2009; Seifert and Comas, 2012). Low consumer recognition of labels might be a disincentive for companies (Dangelico and Pujari, 2010). These factors, reported the participants, were used in company decision making. Although the impact of the economic downturn from 2008 onwards is not entirely quantifiable, there is evidence of some change in consumer willingness to purchase and/or spend extra money on labelled products (Harris Poll, 2012; Nielsen, 2013). It was recognised by a number of interviewees that as the economy contracted, so too did concerns about the environment from customers. Customer attitude and buying behaviour (paying more for green products) may not match up. De Boer (2003) notes that actual purchasing decisions can be a disappointment to companies who pursue a green market segment. Two case study companies, A and Q, found that sales were not as expected on their labelled products, and hence stopped production, regardless of whether it was the label that led to low success, or another factor. A presumed interest among consumers in certified wooden toys did not lead to increased sales for Company Q. Both companies
were unable to attribute this failure to any specific consumer issue. If there is no guarantee of increased sales or reduced costs, there is no incentive to improve the product. Similarly, none of the Preliminary and Main Study participants said that there was evidence of competitive advantage for ecodesigned products in their companies. Company P said otherwise, however, arguing that labels were their main driving force behind their success.

**Scrutiny and use of wrong label**

Further issues with designers’ knowledge affected their confidence in selecting labels. Seifert and Comas (2012, p. 2) argue that ‘ecolabelling can help reduce a company’s risk of being attacked by a pressure group and, should this happen, ecolabelling organizations can provide support in responding to it.’ This was not the case however with Company A, who feared such an attack from pressure groups or competitors if suspected of over-hyping their environmental credentials, so purposefully downplayed a product that was primarily marketed as an “environmentally friendly” product. They did this by declaring that the percentage of material that was recycled content was lower than it actually was, in case the true figure was accused of being incorrect. This pressure may come from environmental pressure groups (Gulbrandsen, 2006), media, or consumers. Other designers, such as those from Company H, were worried about adopting (or trying to) the wrong label, which was risky in their eyes. This suggests awareness of the greenwashing “seven deadly sins” and lack of confidence to avoid them.

**Greenwashing risk**

A significant reason for caution in making environmental claims found in the first two stages of the study was the potential for negative publicity and loss of consumer trust. This confirms the argument of McDermott (2007) who says that consumer confidence remains damaged from “greenwashing” in the past through general scepticism of what companies claim. To return to the example of the 75% recycled material product, Case Study Company A revealed that the product had in fact had a higher recycled content (of around 85 to 90%), but on the packaging, the company had only stated 75% (through a Type II self-declaration) as they were worried that a more thorough investigation into the
product could disprove their bigger claim and be used against them. Their subsequent negative experience with this product (low sales) meant that they made no further attempts to apply labels to other products. Although SMEs might be “pro” ecodesign and application of labels (supporting literature in this area such as Boonkanit et al., 2007; Bras, 1997; Bruce and Laroiya, 2006), there are mediating factors such that applying labels might not always be economically rewarding for companies (Bratt et al., 2011). The point made by Seifert and Comas (2012), that there is high risk from using the wrong label, was echoed by Main Study participants.

One participant pointed out that there is nothing to stop failing companies from creating a similar looking self-declaration label and making a false claim or saying they considered these things (which concurs with TerraChoice, 2007, on the sins of greenwashing). Companies who commit these greenwashing sins appear to appreciate the value that labels can offer, without being prepared to change their products or practices to truly meet the criteria. Similarly, respondents at all stages of the research project reported that they believed that their company considered recycled and recyclable packaging important in terms of improving public perception of their business, as an easier step than creating a recyclable or otherwise ecodesigned product. This could also be true of resources which require registration fees, such as Ecolabel Index Pro.

**Innovation**

Labels have been noted as prompting innovation in designers (Rubik and Frankl, 2005; Rubik et al., 2008), although the extent to which innovation is a direct result of work to apply a label is questioned (Rubik et al., 2008). Rubik (2008) claimed that label criteria should be the benchmark, but designer 2M said that following label criteria could stifle innovation if it was used as the goal; it was also pointed out that labelling criteria could not keep up with technical advances and market innovations. It could be said that company A’s negative experience of applying a label impeded their future innovations as they resorted back to previous successful product ranges.
8.3.4 Ability to change: the nimble and agile SME

There have been a number of sources that have claimed that SMEs are innovative or have opportunities to be market leaders (Simon et al., 2000) and nimble (Esty and Winston, 2006) and come under less external pressure because of their lower visibility (Lefebvre et al., 2003). SMEs may have a flexible approach that supports innovation (Annable and Burns, 2009), but the risks and complexities of labelling can also be a restriction (Horne, 2009; Houe and Grabot, 2009). Findings in this study have raised a question of the extent of the agility and innovation that SMEs are able or willing to do. This can also affect their ability to be market leaders on ecodesign or environmental labels. The participants indicated that their own companies had a lack of skills and time or resources to do market research that would underpin or justify label use or other design decisions to be made on a product. As noted above, it is less of a risk to mimic or be strongly guided by what competitors are doing, and avoid the heightened scrutiny that environmental claims could create. Any changes present risks, and in the reality of SME operations, there seems to be a focus on survival and short-term stability. The companies in this project were cautious to make short-term investments for long-term gains because as some designers pointed out they could invest but have folded before seeing the benefits or a return. Companies also appear to assume change, especially to reduce environmental impact, will result in increased costs. Despite efficiency savings enjoyed by Company P, in this study several designers remained sceptical given their assumption that anything green costs more money. Switching suppliers or manufacturers and building new relationships throughout the process were raised as time concerns by Case Study Companies A and Q. Even if SMEs are able to make rapid changes, the time required for label certification may mean that this rapid change is delayed to the point of making little difference. There are no guarantees when using labels and SMEs are not big enough or labels not tempting enough for SMEs to take the gamble.

8.4 Comparison of the UK with other countries
The potential impact of environmental labels varies from country to country (Houe and Grabot, 2009). Compared to EU/world leaders such as Germany and the Nordic countries (in terms of the number of products labelled, sales of labelled goods, and consumer understanding and recognition of labels) the UK has lower label use and consumer response. Today, 40 percent of European consumers indicate a willingness to purchase environmentally friendly products regardless of price; and almost half actively save energy or reduce their carbon footprint (Nielsen, 2014). These figures have shown an increase each year recently (Nielsen 2013; 2014). In the UK, these figures are a little lower, with Green Wise Business (2013) noting that a quarter of UK consumers would take the green option even it cost more money; this was an increase from eight percent 17 months earlier. Nielsen’s (2007) report on British consumers reports a greater concern for environmental issues among younger adults and those with young children, across all socio-economic groups. However, the literature shows that the UK is in the top few countries within the EU when it comes to other environmental aspects of SME activities such as efficient resource use or recycling of company waste (EC, 2013b). Additionally, the UK has the highest percentage of SMEs most likely to be planning additional actions to minimise waste (EC, 2013b).

There may be some reasons why there appears to be this difference. Concerning labels, Germany (Blue Angel) and the Nordic Countries (Nordic Swan) have nationally-run labels and with this comes government support for labelling. There is not a government-run label in the UK. The Blue Angel and Nordic Swan labels are well established, which could be a reason for their extensive use in Germany and the Nordic countries respectively, but the EU Ecolabel has also been in operation a long time, which is in operation in the UK. Designers and industry are perhaps assumed to know and accept that labelling will provide a competitive advantage or other economic benefits. Some labels give examples of companies whose marketing and selling campaigns have been strengthened through their use of that label, for instance the Nordic Ecolabel (Nordic Ecolabelling Network, 2014). Figures for the use of the FSC label suggest that in the UK it has been a notable success, with more than 10,000 product lines in the UK currently carrying it, many sold in major retail
stores (FSC, 2014). This is a similar number to the German Blue Angel, currently applied to 12,000 products (Federal Ministry for the Environment, 2014), indicating the strength of the FSC label in the UK.

Evidence suggests that the UK government has chosen to focus on consumer behaviour rather than consumer purchases, such as policies promoting awareness and educating the public on waste reduction (through littering, waste recycling, incentivising recycling by the introduction of the Landfill Allowance Tax for local authorities) (DEFRA, 2013) and reducing carbon dioxide emissions and energy use (insulating homes to make them more energy efficient, educating consumers about energy efficient products and how to save energy, reducing energy demand from industry and businesses) (DECC, 2012). These behaviour-linked initiatives take emphasis away from consumer education through labels; if consumer knowledge of labels is low, consumer demand for label use will be low. Designers reported low knowledge of labels in the UK yet some of the knowledge they did have came from what they had encountered as consumers themselves. It could be argued that designers in countries with higher up take of labels such as Germany and the Nordic countries would know more about labels because they encounter them more as consumers. If they know about them, then they have the opportunity or base knowledge to potentially suggest label use in the PDP. EC statistics (2013b) state that, in terms of companies offering green products, UK and German levels are similar (31 and 33 percent respectively). The number of companies who answered “don’t know” was 16 percent in the UK and 4 percent in Germany.

Design processes and company structure vary little from country to country and so the findings here for the UK concerning drivers and barriers for SMEs, the place of labels in the PDP, may apply also to SMEs in other countries. Formal education for designers is also likely to be similar, however designers in countries such as Germany and Nordic countries may have more awareness of labels as consumers because of their greater exposure to them in that sense. Government-run labels may also be promoted by government in those countries, encouraging companies to use those labels specifically.
8.5 Concluding comment

This chapter has considered some valuable findings and questions within this project. The significant findings raised in this Discussion highlight the broad themes for the factors affecting designers’ implementation of environmental labels:

- Position and influence of in-house industrial designers within company, PDP and design brief
- Designers’ knowledge in the initiation and process of applying labels
- Drivers and barriers at whole company level including existing pressures and risks of label use
- A lack of ecodesign skills leading to inability or low confidence in meeting label criteria

Conclusions will be drawn on these factors and other significant findings in the following chapter.
9 CONCLUSIONS

This chapter presents conclusions, the limitations of the study, and further work. It draws together the general conclusions for the work presented in this thesis, reflects on how the objectives were satisfied and presents the contribution to knowledge which has been made by this study. To recap the methodology, an emergent, exploratory research design was used, with three empirical studies carried out with practicing industrial designers working in-house in UK SMEs.

The first stage, the Preliminary Study, involved an online survey of designers and follow-up interviews. A prototype Resource (DELR) was developed using Preliminary Study participants’ suggestions or requests concerning information. This Resource was subsequently used as an elicitation tool in the second stage of data collection, the Main Study. It prompted further explanation from designers of their design processes, decision making and how labels could be implemented. Many of the designers in the Preliminary and Main Studies had not had experience of implementing labels. In order to identify factors affecting designers who had successfully used labels, Case Studies were carried out with three SMEs. The Case Studies were used to gain an additional perspective on designers who have experience of using environmental labels and could outline good practice.

The multiple elements of this research project, combining Preliminary survey and interviews, creation of ‘DELR’, the Main Study, and the Case Studies, have addressed the objectives of the study and identified issues regarding the how and whether designers implement environmental labels. Table 9.1 below details which chapters satisfied each of the four research objectives outlined at the start of the thesis.
Objectives

<table>
<thead>
<tr>
<th>Objective</th>
<th>Achieved in:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. To review the impact of existing types of environmental labels available in the UK</td>
<td>Chapter 2</td>
</tr>
<tr>
<td>2. To survey what in-house industrial designers currently know about environmental labels by establishing contact with a sample of those within UK SMEs</td>
<td>Chapter 4, 6, 7</td>
</tr>
<tr>
<td>3. To investigate where environmental labels currently fit into the work of in-house industrial designers in UK SMEs</td>
<td>Chapter 4, 6, 7</td>
</tr>
<tr>
<td>4. To understand the factors that affect the implementation of environmental labels in UK SMEs by in-house industrial designers</td>
<td>Chapter 4, 6, 7</td>
</tr>
</tbody>
</table>

Table 9.1. Chapters that satisfy the research objectives

This chapter outlines the principal conclusions from the project, discusses limitations, generalisability and future work, and the contribution to knowledge made by this thesis.

9.1 Conclusions from the thesis

This study investigated factors affecting the implementation of environmental labels by in-house industrial designers in UK SMEs. The significant conclusions are:

- The position and influence of designers in their companies significantly moderates their ability to implement labels;
- Cooperation and collaboration of all professionals involved in the PDP is significant to the effective application of labels;
- Awareness and understanding of labels amongst designers was low and so to counter low knowledge of environmental labels, information and education for all professionals involved in the PDP is valuable;
The notion of the agile and/or innovative SME can be questioned. The cost effectiveness of environmental labels for SMEs is frequently unclear to them. Designers in SMEs may lack the skills necessary to achieve environmental label criteria.

**Position and influence of designers in their companies**

Designers’ position within companies especially in terms of their input on design briefs has been a crucial mediating point in this study of designers and environmental labels. Designers are sometimes considered practically and morally responsible for the majority of environmental impacts that a product has. However, this is affected by their position and influence within the company. If designers have a small influence in a company this may affect their ability to persuade the company to undertake ecodesign and/or implement environmental labels, especially if designers are expected to be the “environmental champions” in their company. Labels are most effectively implemented at early stages of the PDP. If designers have no influence over or do not contribute to the design brief, and environmental concerns or labelling are not specified in the brief by others, they are unable to effectively implement labels (effectively meaning having an impact on the design of the product to lead to a reduced environmental impact). This is significant because it questions the claim that it is designers’ responsibility to lead implementation of labels or other ecodesign strategies. This has a wider significance for designers beyond ecodesign by raising that major changes to products cannot be made by designers without these specifications being stipulated in the design brief, and for designers to do this they must have influence. This has value for understanding of all SME operations not just those implementing labelling, as designers’ position in relation to the PDP is not specific to labelling or ecodesign.

**Cooperation and collaboration of all professionals involved in the PDP**

Following from this, cooperation from other professionals is valuable for many designers given their position outside of design brief decisions. However, this does not just mean colleague cooperation with designers’ instructions or environmental championing, as their low influence may mean that they are not
listened to. A whole company approach or commitment could mean top-down policy, with initiation coming from managers. While the engagement of other professionals in ecodesign has been noted previously, this project concludes that support at all stages is crucial; many environmental labels have an impact throughout the PDP and affect such things as materials selection, supply chain, manufacturers and marketing. Ultimately lack of communication or a driving force could result in a label not being applied because of not satisfying certification criteria. If an SME desires to introduce any initiative, with someone to steer it, they need to be able to share relevant information with others in the company and attain successful team work to achieve the goal.

**Low awareness and knowledge**

Despite it being suggested in the literature that designers should be promoting ecodesign and environmental label use, the data on their knowledge and skills in applying labels did not on the whole support this idea. Designers’ existing knowledge and awareness of labelling, previous experience, and ability to discover information and then act on it, vary. This represents a concern and again an unclear responsibility among designers over labelling. Potentially, knowledge and skills required to fulfil criteria for the application of labels may also be lacking, affecting implementation. Even if designers are aware of label criteria, this is potentially not enough; if given responsibility over labelling, designers also need to have skills and confidence in doing ecodesign in order to follow label criteria. Providing other factors are in place that facilitate the gaining of knowledge and skills towards having the experience and confidence to fulfil criteria, then the effect on implementation can be minimised. This includes the influence and knowledge of other professionals in the PDP, the inclusion of environmental labels in the design brief, and top-down company policy supporting label use. Many studies have surveyed consumer knowledge and awareness of labels, and some company awareness, but few have focused specifically on designers. An environmental champion can assist label implementation by seeking and sharing requisite information, but this does not have to be a designer. Designers cannot be expected to be experts in all aspects of design but low awareness suggests that further inclusion of labels and labelling processes in initial formal design education and continuing
professional development (CPD) would be of benefit. This raises a question over whose responsibility it is to educate designers and other professionals on labels, and similarly, who benefits from increased knowledge. To focus on SMEs here, for SMEs to lead the education or CPD of their workforce, they have to note and realise that increased knowledge will benefit them.

This also has implications for labelling organisations. While considering labelling organisations in depth is beyond the scope of this project, several points of interest have been raised through the research. Low awareness of labels in the UK has been identified in this study. Labelling organisations may want to consider making specific information available to the different professionals within companies (e.g. designers, marketers, material purchasers, company director) or present it in a particular way to encourage uptake and involvement. Explicitly, this might include successful examples, or statistics on take up of their label, market share or number of products that are certified or listed. Few organisations know how many products use their label.

**Questioning the notion of the agile SME**

Relatedly, the project has illuminated further how SMEs deal with a number of risks and uncertainties, some in the implementation of labels, and they have indicated a need to be sure of attributing some success to labels in order to take them up or continue using them. SME concerns about economic costs and other upheavals or risks resulting from change may affect their propensity toward ecodesign and/or labelling. The notion of the agile and flexible or innovative SME is noted in previous work, with this type of company assumed to be able to make changes quickly. However this project questioned the extent to which this tag can be applied to all SMEs. There are market uncertainties involved when making investments into product design, supply chain, materials selection and manufacture that create financial risks and may prevent change. This is a valuable conclusion beyond the concerns of this project as again this may relate to SME operations aside from just those engaged in ecodesign or applying labels.
9.2 Critique of the research project

9.2.1 Limitations

Some issues are examined here as potential limitations of the project. In conducting the Preliminary and Main Studies with designers, the aim was to recruit practising designers from SMEs operating in the UK, recruited predominantly through social media professional networks for industrial designers. As was discussed in Chapter 3, recruitment was disappointingly low initially. The interview stage of the Preliminary Study then used some of those survey respondents who had agreed to be involved in further research. Whilst visiting these interviewees, on some occasions colleagues were also interviewed. For the Main Study, some of the Preliminary interviewees were revisited, and some new participants were recruited. The Case Studies were purposively sampled after an identification of companies successfully implementing labels. While none of these participants can be said to be representative of the whole field of UK SME in-house designers, as practising designers their data do represent the knowledge, experiences and concerns of designers, demonstrating some of the factors that affect some of the field. Whilst response rates were disappointing, a useful number of respondents was achieved for the qualitative methods used.

The Resource acted as an elicitation tool in the Main Study, to offer designers the knowledge that had been requested in the Preliminary Study, so that they could be prompted for discussion of their need for information and other factors. Designers were not asked to take the Resource away and use it for a period of time, or keep a diary about their use of it. If they were to do so, this may have generated data on designers’ practical use of information and enabled further insight. However, intended as an elicitation tool, the Resource’s purpose in the Main Study interviews was served.

The three stages of study in this project were necessarily small. Because of the type of project, repeating this project may well yield different individual responses. For instance, the Case Studies involved three SMEs. This is evidently not a high number in comparison to the number of designers and
companies in this sector in the UK as a whole, although the nature of case study research aims for depth not breadth. Additionally, no financial information could be gained from these companies, such as profit and margins. The designers provided insights in the some of the real opportunities and problems that these SMEs and their designers experience regarding environmental labels. Similarities were found between the three, including the level of knowledge of labels among designers, and that other colleagues throughout the PDP had to also be on board with the labelling in order for the project to be successful. As explained in Chapter 3, interpretive research does not claim to be exactly repeatable. On a different day the interviewees throughout the project may have had a different product or design brief in mind and provided different answers based on these reflections; this should be seen as something that contributes to the nuance and complexity of a project in the social world (Patton, 2002).

9.2.2 Generalisability

The research took on survey and case study research designs for rich understanding (Thomas, 2009). Cases were purposively chosen that were of special interest: designers in SMEs who are already applying environmental labels to a product. These were "instrumental" cases (Stake, 2000) or illustrative of concerns related to the research questions, and although not necessarily generalisable they offer understanding of the context. Of the 45 participants interviewed and 44 surveyed, they were varied and represented a range of companies. For example, not all were "pro" or "anti-" ecodesign, and they had a range of experiences with labels. A range of responses have been gathered that are representative of factors affecting in-house industrial designers in SMEs other in-house designers in UK SMEs. The consistency of the findings among the SMEs and designers in the project indicates that Lincoln and Guba’s (1985) concept transferability, in place of generalisability (which they see as a concept more suited to quantitative research), is valuable here. Transferability to in-house designers in SMEs both in the UK and in other countries may be possible: the PDP tends to be consistent without great
variation; similarly, the role of in-house designers in SMEs does not differ widely.

9.2.3 Future research

Getting labels onto company agenda
A significant conclusion raised in this research was the place and influence of in-house designers working in UK SMEs, and how this affected their ability to implement environmental labels. Future research could be fruitful in taking a whole company approach to a case study project with SMEs who have experience of using environmental labels, both successfully and not so. This should involve all professionals in the PDP, such as managers and marketers, who contribute to or shape the design brief or company policy with regards to implementing environmental labels and ecodesign. A potential research question might be, how are decisions to take up environmental labels or ecodesign in general made and communicated? This research could be carried out by labelling organisations so in future they can tailor information about their label to the different professionals likely to be involved in the decision making process. This could also be of interest to governments who have a role in administrating various labelling schemes and encouraging companies to use them.

Detailed case studies of successful label implementation
This further work could also expand insight into the workings of SMEs in relation to environmental labelling, working with other companies to identify how their professionals, PDP and approach to labelling fit together. A focused sample in, say, one particular product area, could strengthen research knowledge of practical issues in implementing environmental labels. Expanding a case study approach would also address the request of designers in the Preliminary and Main Studies for case study information on label application – something they found lacking. Using the Resource, designers also raised questions about label organisations’ provision of information on their labels – future research then could address best practice on information or look for ways to encourage label
organisations to provide case studies or financial information that might encourage label use or assist companies to make decisions confidently; it appeared in the project that the impact of labels is hard to measure. This financial information should address the cost-effectiveness of labels, a major concern for SMEs, noting upfront investment costs as well as certification costs or ongoing subscription and/or percentage of sales costs. This research focused on SMEs, however research with companies of varying sizes could aid in ascertaining further specific requirements as well as broader trends across industry. A potential research question might be, what is best practice in terms of encouraging cooperation from all professionals? Again, this research could prove beneficial to labelling organisations wishing to encourage more companies to use their label and provide support for those who chose to. In academia, researchers in design (particularly sustainable and ecodesign) may consider the insights this research into the variation of workings in different SMEs within the same product sector who have successfully implemented environmental labels valuable for the introduction of other environmental initiatives.

**Knowledge Transfer Networks of SMEs sharing knowledge and skills**

In recognition of low knowledge and understanding amongst designers in this project, and low knowledge and skills of ecodesign within SMEs identified in literature, a potential future research project could involve the grouping together of SMEs to see how working collaboratively in relation to environmental labels and ecodesign in general could be beneficial. This could include the sharing of information, knowledge, skills, and “environmental champions”. This would build on the support that designers this project gave towards the Forum and Ask an Expert feature. This research could be conducted by academics whom may have an interest in developing the dissemination of skills and knowledge, and could also be of benefit to the participating SMEs. Governments may also want to be involved in this research to support SMEs and help them to become more profitable.

**Designers’ knowledge of labels**
Significantly, there is value in this research for design education, around environmental labels shared at undergraduate and postgraduate levels. Case study work into the type and level of education on environmental labels within ecodesign or sustainability modules and the centrality of this in design education (and not forgetting business/marketing education) could build a picture of environmental label knowledge with a view to recommending improvements for label organisations, educational institutions and government. Interventionist work might make additions to sustainable design module syllabi to incorporate practical and theoretical knowledge on labels, and hence test whether labelling processes and criteria can be successfully learnt outside of a practicing design setting. For these reason academics should continue to engage in research into design education as ecodesign becomes increasingly incorporated into mainstream design education. Labels should be a part of this, because they are recognised as a valuable method for informing consumers about environmental credentials of a product and/or company. To encourage a whole company approach, as supported earlier, a continuing professional development (CPD) method could help, and be included in further work into how companies gain, develop and use knowledge. Responsibilities for designers might include their own CPD, informing themselves further about labels. Designers might do this to make themselves more valuable, however equally it could be argued that companies have responsibility for the CPD of their professionals, or at least providing them with time in which to research initiatives such as labels, as the results could be of benefit for the company.

**Impact of the recession on environmental labelling landscape**

Finally, this project took place over the duration of the deepest recession since the Great Depression of the 1930s (Bank of England, 2010), an economic climate which undoubtedly affected the findings and outcomes of the research due to reductions in consumer spending, disposable incomes, and demand for green products (Nielsen, 2007, 2013; ONS, 2013). However, without longitudinal work across periods of recession and growth, the full impact of the recession on this project cannot be known. It would be useful then for the above suggested future research to factor in economic climate and look to longitudinal research designs or seek factors contributing to good practice in periods of
growth and recession. Labelling organisations should consider conducting this type of research to help them develop and better market their schemes, as there are some who are unaware of how many products carry their label in the marketplace. With further knowledge of their labels’ financial implications, especially the cost effectiveness, labelling organisations could contribute to supporting top-down strategic company policy. This is the sort of information which the literature and the empirical studies from this research project had identified as being requested by designers and their colleagues. This data on market and consumer purchase decisions could also help government to decide which labels require additional support through efforts such as consumer education and targeted public procurement.

### 9.3 Contribution to knowledge

The findings from this study make several contributions to the literature on designers’ knowledge and use in their work of environmental labels. It offers insight into designers’ capability to implement labels, showing variation in the factors affecting implementation. Some were related to designers’ position within their company, specifically their influence in early stages of the PDP such as the setting of the design brief, while others were affected by designers’ low knowledge and awareness of labels. The thesis has developed understanding of the varied roles and responsibilities designers can have within SMEs. Effective implementation of labels was known to occur at the early stages of the design process, and designers’ responsibilities over environmental labelling, ecodesign or environmental impact have been found to depend on the place of designers in decision making in these early stages.

There were distinct hurdles for designers or their colleagues as individuals affecting the initiation or process of labelling. Designers occupy a valuable role if a company is to apply labels or have a commitment to certification, ecodesign or other aspects related to successful implementation of environmental labels. In order for designers to be able to carry out this role, it must be recognised that
they are positioned within a team and a PDP involving multiple professionals, and have the necessary information.

While this project contributes to discussion on designers as individuals, it also notes mitigating factors in SME implementation of labels. A company perspective was noted to place designers’ situations in context. The project concludes that it is not just designers who can be held responsible for label implementation; other professionals within the company may also be responsible, may also drive implementation, or may be the source of knowledge. This research has investigated where designers’ implementation of labels is positioned amongst the wider environmental labelling landscape, contributing to the appreciation of the pressures in-house industrial designers in SMEs face throughout the PDP. This mediates claims that designers have responsibility to promote, establish and implement labels and ecodesign. Importantly, within SMEs the whole company needs to work collaboratively for effective label implementation.
REFERENCES


Green Wise Business (2013)


Leire, C. and Thidell, Å (2005) Product-related environmental information to guide consumer purchases – a review and analysis of research on perceptions, understanding and use among Nordic consumers Journal of Cleaner Production 13, 1061-1070


Seifert, R.W. and Comas, J.M. (2012) Have ecolabels had their day? The truth behind sustainability labels from people who integrate them. *IMD (International Institute for Management Development)* Lausanne, Switzerland.


APPENDICES

Appendix i: Preliminary Study – Survey Cover Sheet

Hello [INSERT NAME IF KNOWN], I am seeking your assistance.

I am in the second year of my PhD in the Department of Design and Technology at Loughborough University. I am currently conducting an online survey of industrial designers working in UK SMEs. This survey is looking into the role and influence of environmental labelling schemes on designers throughout the design process.

I would be very grateful if you could take the time to complete the online survey to aid me with my research (assuming you are a designer). The survey should take approximately 20 minutes to complete. All answers given will be kept private and confidential. The data gathered will only be made available to myself and other selected research associates within Loughborough University’s Sustainable Design Research Group.

The survey can be found at the following address:

http://www.survey.lboro.ac.uk/ecolabel

For further information about either the survey or my research you can contact me at:

Daniel Horne
Department of Design & Technology
Loughborough University
Loughborough
Leicestershire
UK LE11 3TU

Email: cddmh@lboro.ac.uk
Mobile: +44 (0) 7515369841
Office: +44 (0) 1509 228321

Thank you in advance for your participation. If you could forward this to any other designers you know it would be of great benefit to my work.
Appendix ii: Preliminary Study – Survey 1

Welcome

Hello and welcome to the survey.

Thank you for taking the time to complete this survey and assist me with my studies. This online survey should take approximately 20 minutes to complete.

Introduction to research

This survey is part of a wider research study into the influence of environmental labelling schemes currently operating within the UK have on in-house industrial designers in UK SMEs.

For further information before completing the survey you can contact:
Daniel Horne
Department of Design and Technology
Loughborough University
Loughborough
Leicestershire
LE11 3TU

Email: cddmh@lboro.ac.uk
Office: +44 (0) 1509 #######
Out of Office: +44 (0) 7515 #######

Survey Information

When completing this survey, you can leave it at any point and return to it later but you are unable to go back to change answers once you have given them.

Some questions have 'More Info' boxes on the right. Clicking on this will provide more information about the question.

Your answers will only be submitted once the whole survey is completed.

Data Protection Information

All information gathered through this study will be kept private and confidential. It will only be available to myself and other select research associates.

By completing your name below you are agreeing to take part in the study. Your name will not appear on any work and will only be available to myself for reference purposes.

1. Your Name


2. Your age

Select an answer
**About You**

These first few questions are about your profession. They cover your design job, experience and education. All answers given are to be kept to be confidential.

### Your job

3. What is your current job title / job description?

4. What type of designing are you currently involved with?  
 *(select all that apply)*

- Freelance
- In-house
- Consultancy
- N/A

5. What type of design have you done in the past?  
 *(select all that apply)*

- Freelance
- In-house
- Consultancy
- N/A

6. What product(s) / service(s) do you design in your current job?  
 *(select all that apply)*

- Consumer Electronics
- Domestic Appliances
- Mechanical Products
- Industrial Products
- Packaging
- Web-based
- Other *(please specify)*:

7. What product(s) / service(s) have you designed in previous jobs?  
 *(select all that apply)*

### Your education

8. Please list what qualifications you have that are relevant to your work as a designer  
 *(select all that apply)*

- GCSE / O Level
- A Level / equivalent
- Apprenticeship
9. How many years have you been working as a designer?

10. Have you been offered the opportunity of further training / retraining / additional qualification when working for a company?

   - Yes
   - No

   a. If yes, how was it delivered? (select all that apply)
      - In-house training from company employee
      - In-house training from external instructor / consultant
      - External Training day(s)
      - Self-taught course
      - Other (please specify):

   b. and please give details about the subject / course content

11. Have you been offered training specifically to do with environmental issues in design?

   - Yes
   - No

   If yes, could you please provide some more information about what was offered

Design Process

Design Brief

12. How often do you work to a design brief?
13. How often do you have input into the design brief?

- Always
- Often
- Rarely
- Never

14. Who within the company has influence over the setting of the design brief? (select all that apply)

- You (as a designer)
- Other designers
- Marketing practitioners
- Sales representatives
- Materials purchasing department
- Industrial / Manufacturing technicians
- Other (please specify):

15. Which of these other factors, if any, influence the Design Brief? (select all that apply)

- Company Policy
- Customers
- Consumers
- Market Research
- Other (please specify):

Your role within the design process

16. Please indicate which aspects of the design process you are involved with within your job.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Always</th>
<th>Occasionally</th>
<th>Rarely</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Writing the Design Brief</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Responding to the Design Brief</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Writing the Product Specification</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Responding to the Product Specification</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conceptual Design</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Design Development</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Materials Selection</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Resources for Design

18. Rate the usefulness of the following types of resources available if you have used them. Please select 'Not used' for those you have not used before.

<table>
<thead>
<tr>
<th>Resource</th>
<th>Not used</th>
<th>Very useful</th>
<th>Quite useful</th>
<th>Not very useful</th>
<th>No use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
19. Rate the usefulness of the following subjects covered in the resources available if you have used them.

<table>
<thead>
<tr>
<th>Subject</th>
<th>Not used</th>
<th>Very useful</th>
<th>Quite useful</th>
<th>Not very useful</th>
<th>No use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life Cycle Analysis (LCA)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Materials information and selection</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technical help and advice</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Reference material</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Existing product information</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Inspirational</td>
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<td></td>
</tr>
</tbody>
</table>

20. Rate the usefulness and the ease of access to the various forms of resources available.

<table>
<thead>
<tr>
<th>Resources</th>
<th>Usefulness</th>
<th>Ease of access</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online / Web-based</td>
<td>Not used</td>
<td>Very useful</td>
</tr>
<tr>
<td>Software</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Books / Magazines / Trade Publications</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Environmental Design

21. These are some examples of the forms that environmental design has taken:

<table>
<thead>
<tr>
<th></th>
<th>Have you heard of this type of design?</th>
<th>Do you understand what the term means?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Green Design</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Design for Environment (DfE)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eco Design</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sustainable Design</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Design for Sustainability</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Environmental Design Continued...
There are a number definitions for terms and concepts of environmental design. Over time these have become blurred through overlapping and are often interchanged without thought. For the purpose of this study, the definitions for each concept / term are given below.

DEFINITIONS:

**Green Design** - Making design decisions so the environmental performance of a product/service can be used as the main selling point.
OR
Making design decisions based upon sound environmental principles.

**Design for Environment (DfE)** - Making design decisions based on minimising environmental impact throughout the design process.

**Eco Design** - Considers both environmental and economical impacts of design decisions throughout the design process.

**Sustainable Design** - Considers the environmental, economical and
social impacts of design decisions throughout the design process.

**Design for Sustainability** - Considers all of the short-term and long-term impacts that design decisions could have on both society and the environment.

**Environmental Design Continued...**
Using the definitions above, please answer the following questions

22. Does the company you are currently employed with do any of these to your knowledge?

<table>
<thead>
<tr>
<th>Design for Environment (DfE)</th>
<th>No but not sure</th>
<th>Yes but not sure</th>
<th>Yes</th>
<th>Don’t Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green Design</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eco Design</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sustainable Design</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Design for Sustainability</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

If you cannot say for certain, please indicate whether you suspect they do or not.

23. Do you as a designer consider any of these through your work?

<table>
<thead>
<tr>
<th>Design for Environment (DfE)</th>
<th>No but not sure</th>
<th>Yes but not sure</th>
<th>Yes</th>
<th>Unsure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green Design</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eco Design</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Sustainable Design</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Design for Sustainability</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

If you are not sure if you do or not, refer to the list of definitions at the top of the page.

24. At what stage(s) of the design process do you consider economic factors? 
*(select all that apply)*
<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>25. At what stage(s) of the design process do you consider environmental factors?</td>
<td>Writing the Design Brief, Responding to the Design Brief, Writing the Product Specification, Responding to the Product Specification, Conceptual Design, Design Development, Materials Selection, Prototype Modelling, Prototype Testing, Other (please specify):</td>
</tr>
<tr>
<td>26. At what stage(s) of the design process do you consider social factors?</td>
<td>Writing the Design Brief, Responding to the Design Brief, Writing the Product Specification, Responding to the Product Specification</td>
</tr>
</tbody>
</table>
27. Rate the usefulness of the following examples of environmental design resources and tools if you have used them.

<table>
<thead>
<tr>
<th>Resource</th>
<th>Not used</th>
<th>Very useful</th>
<th>Quite useful</th>
<th>Not very useful</th>
<th>No use at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials selection databases</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Life Cycle Analysis (LCA) software</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>'InformationInspiration' website</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inspirational products/materials</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental Design guidelines</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental label specification</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

28. What features would you like from an environmental design tool or methodology, if any? (Optional)

Environmental Labelling Schemes

Type I Environmental Labelling Schemes

Label 1  Label 2  Label 3

29. Above there are some examples of environmental labels. Please look at the
30. Above there are some examples of environmental labels. Please look at the
different labels and answer the questions below:

<table>
<thead>
<tr>
<th>Do you recognise?</th>
<th>Can you tell me the name of the label and/or the labelling scheme it is connected with?</th>
<th>Can you please tell me what information you think the labelling scheme is attempting to provide.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Label 1:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Label 2:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Label 3:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Other Environmental Labelling Schemes

<table>
<thead>
<tr>
<th>Label 4</th>
<th>Label 5</th>
<th>Label 6</th>
<th>Label 7</th>
<th>Label 8</th>
</tr>
</thead>
</table>

Other Environmental Labelling Schemes
31. Above there are some examples of environmental labels. Please look at the different labels and answer the questions below:

<table>
<thead>
<tr>
<th>Label 9</th>
<th>Label 10</th>
<th>Label 11</th>
<th>Label 12</th>
<th>Label 13</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Do you recognise?</th>
<th>Can you tell me the name of the label and/or the labelling scheme it is connected with?</th>
<th>Can you please tell me what information you think the labelling scheme is attempting to provide?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

- **Environmental Labelling on products**

32. Which of the labels above are applied to products you currently design, if any? *(select all that apply)*

- Label 1
- Label 2
- Label 3
- Label 4
- Label 5
- Label 6
- Label 7
- Label 8
- Label 9
- Label 10
- Label 11
- Label 12
- Label 13
- None

- **Environmental labels through your work**

33. Do you use environmental labels to aid your design decision making currently?

- Yes
- No

Can you say how you use them and how often?

- **Do you design products that are awarded environmental labels?**
Yes  ☐ No

**a.** If yes, can you:
please say which product(s) / service(s)

**b.** and can you say which label(s)?

---

35. Which of these, if any, do you think would benefit from environmental labels?
(select all that apply)

☐ You (as a designer)  ☐ Other designers  ☐ Company
☐ The products/services you design  ☐ Consumers
☐ Other (please specify):

36. Which of these, if any, do you think would benefit from knowing the criteria required for various environmental labels?
(select all that apply)

☐ You (as a designer)  ☐ Other designers  ☐ Marketing practitioners
☐ The company  ☐ The products/services you design  ☐ Consumers
☐ Other (please specify):

37. Which of these, if any, would benefit from having guidelines advising ways to act/design with environmental labelling in mind?
(select all that apply)

☐ You (as a designer)  ☐ Other designers  ☐ The company  ☐ The products/services you design  ☐ Consumers
☐ Other (please specify):

38. Which, if any, would benefit from a tool or methodology to ensure that products/services are eligible for specific environmental labels.
39. At what stage(s) of the design process would you consider environmental labelling? (select all that apply)

- Writing the Design Brief
- Responding to the Design Brief
- Writing the Product Specification
- Responding to the Product Specification
- Conceptual Design
- Design Development
- Materials Selection
- Prototype Modelling
- Prototype Testing
- Marketing
- Other (please specify):

Thank you
Thank you for taking the time to complete this survey.

If you would like to receive information about the key findings from this survey, please email me and I shall send you the report once all the data has been collected and analysed.

Daniel Horne
cddmh@lboro.ac.uk

Further research
Following the analysis of the results from this survey, it is anticipated that certain respondents may prove of particular benefit to the study if they take part in a brief interview to yield more in-depth responses.
If you wish to be contacted about this stage of the research, please state below.

40. Do you wish to be considered for further interviewing?

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ Yes</td>
<td>☐ No</td>
</tr>
</tbody>
</table>

**a.** Primary contact email: 

**b.** Primary phone contact: 

---

**Environmental Labelling for Designers**

Thank you for completing this survey. Your results have been submitted.
Appendix iii: Preliminary Study – Survey 2

Welcome
Hello and welcome to the survey.

Thank you for taking the time to complete this survey and assist me with my studies. This online survey should take approximately 10 minutes to complete.

Introduction to research
This survey is part of a wider research study into the influence that environmental labelling schemes currently operating within the UK have on in-house industrial designers in UK SMEs.

For further information before completing the survey you can contact:
Daniel Horne
Department of Design and Technology
Loughborough University
Loughborough
Leicestershire
LE11 3TU
Email: cddmh@lboro.ac.uk
Office: +44 (0) 1509 ######
Out of Office: +44 (0) 7515 ######

Survey Information
Thank you for taking the time to complete this survey and assist me with my studies.

Some questions have 'More Info' boxes on the right. Clicking on this will provide more information about the question.

Your answers will only be submitted once the whole survey is completed.

Data Protection Information
All information gathered through this study will be kept private and confidential. It will only be available to me and other select research associates.

By completing your name below you are agreeing to take part in the study. Your name will not appear on any work and will only be available to myself for reference purposes.

1. Your Name

[Input field]

2. Your age

[Input field]

[Select an answer]
About You
These first few questions are about your profession. They cover your design job, experience and education.

All answers given are to be kept to be confidential.

Your job
3. What is your current job title / job description?

4. What type of designing are you currently involved with?
   (select all that apply)
   - Freelance
   - In-house
   - Consultancy
   - N/A

5. What type of design have you done in the past?
   (select all that apply)
   - Freelance
   - In-house
   - Consultancy
   - N/A

6. What product(s) / service(s) do you design in your current job?
   (select all that apply)
   - Consumer Electronics
   - Domestic Appliances
   - Mechanical Products
   - Industrial Products
   - Packaging
   - Web-based
   - Other (please specify):

7. What product(s) / service(s) have you designed in previous jobs?
   (select all that apply)
   - Consumer Electronics
   - Domestic Appliances
   - Mechanical Products
   - Industrial Products
   - Packaging
   - Web-based
   - Other (please specify):

Your education
8. Please list what qualifications you have that are relevant to your work as a designer
   (select all that apply)
9. How many years have you been working as a designer?


10. Have you been offered the opportunity of further training / retraining / additional qualification when working for a company?

- Yes
- No

a. If yes, how was it delivered? (select all that apply)
   - In-house training from company employee
   - In-house training from external instructor / consultant
   - External Training day(s)
   - Self-taught course
   - Other (please specify):

b. and please give details about the subject / course content

11. Have you been offered training specifically to do with environmental issues in design?

- Yes
- No

If yes, could you please provide some more information about what was offered

Design Process
Design Brief

12. How often do you work to a design brief?

☐ Always ☐ Often ☐ Rarely ☐ Never

13. Who within the company has influence over the setting of the design brief?
(select all that apply)

☐ You (as a designer) ☐ Other designers ☐ Marketing practitioners
☐ Sales representatives ☐ Materials purchasing department
☐ Industrial / Manufacturing technicians
☐ Other (please specify):

Resources available to aid design

14. Rate the usefulness and the ease of access to the various forms of resources available.

<table>
<thead>
<tr>
<th>Resources available to aid design</th>
<th>Usefulness</th>
<th>Ease of access</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not used</td>
<td>Very useful</td>
</tr>
<tr>
<td>Online / Web-based</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Software</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Books / Magazines / Trade Publications</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internal Colleagues</td>
<td></td>
<td></td>
</tr>
<tr>
<td>External Experts</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Environmental Design

15. These are some examples of the forms that environmental design has taken:
Have you heard of this type of design?

<table>
<thead>
<tr>
<th>Type</th>
<th>Yes</th>
<th>No</th>
<th>Yes</th>
<th>No</th>
<th>Unsure</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Green Design</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Design for Environment (DfE)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Eco Design</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Sustainable Design</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Design for Sustainability</td>
<td></td>
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</tr>
</tbody>
</table>

Do you understand what the term means?

<table>
<thead>
<tr>
<th>Type</th>
<th>Yes</th>
<th>No</th>
<th>Yes</th>
<th>No</th>
<th>Unsure</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Green Design</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Sustainable Design</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Design for Sustainability</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

16. Rate the usefulness of the following examples of environmental design resources and tools if you have used them.

<table>
<thead>
<tr>
<th>Resource</th>
<th>Not used</th>
<th>Very useful</th>
<th>Quite useful</th>
<th>Not very useful</th>
<th>No use at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials selection databases</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Life Cycle Analysis (LCA) software</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inspirational products/materials</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental Design guidelines</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Environmental label specification</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

17. What features would you like from an environmental design tool or methodology, if any? *(Optional)*
18. Above there are some examples of environmental labels. Please look at the different labels and answer the questions below:

<table>
<thead>
<tr>
<th>Label 1</th>
<th>Label 2</th>
<th>Label 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Label 1" /></td>
<td><img src="image" alt="Label 2" /></td>
<td><img src="image" alt="Label 3" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Do you recognise?</th>
<th>Can you please tell me what information is being given by the label?</th>
<th>Have you designed a product that has displayed this label?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Other Environmental Labelling Schemes**

<table>
<thead>
<tr>
<th>Label 4</th>
<th>Label 5</th>
<th>Label 6</th>
<th>Label 7</th>
<th>Label 8</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Label 4" /></td>
<td><img src="image" alt="Label 5" /></td>
<td><img src="image" alt="Label 6" /></td>
<td><img src="image" alt="Label 7" /></td>
<td><img src="image" alt="Label 8" /></td>
</tr>
</tbody>
</table>

19. Above there are some examples of environmental labels. Please look at the different labels and answer the questions below:

<table>
<thead>
<tr>
<th>Label 4</th>
<th>Label 5</th>
<th>Label 6</th>
<th>Label 7</th>
<th>Label 8</th>
</tr>
</thead>
<tbody>
<tr>
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<td><img src="image" alt="Label 7" /></td>
<td><img src="image" alt="Label 8" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Do you recognise?</th>
<th>Can you tell me the name of the label and/or the labelling scheme it is connected with?</th>
<th>Have you designed a product that has displayed this label?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

312
Other Environmental Labelling Schemes

20. Above there are some examples of environmental labels. Please look at the different labels and answer the questions below:

<table>
<thead>
<tr>
<th>Label</th>
<th>Do you recognise?</th>
<th>Can you tell me the name of the label and/or the labelling scheme it is connected with?</th>
<th>Have you designed a product that has displayed this label?</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Environmental labels through your work

21. Do you think about environmental labels during the product development process?

- [ ] Always
- [ ] Sometimes
- [ ] Rarely
- [ ] Never

Can you say how you use them? (Optional)

22. At what stage(s) of the product development process would you consider environmental labelling? (Optional) (select all that apply)
<table>
<thead>
<tr>
<th></th>
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<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
</tbody>
</table>

23. Which of these, if any, do you think would benefit from environmental labels?  
(select all that apply)

<table>
<thead>
<tr>
<th></th>
<th>You (as a designer)</th>
<th>Other designers</th>
<th>Company</th>
<th>The products/services you design</th>
<th>Consumers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>[ ]</td>
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<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td></td>
<td>Other (please specify):</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

24. Which of these, if any, do you think would benefit from knowing the criteria required for various environmental labels?  
(select all that apply)

<table>
<thead>
<tr>
<th></th>
<th>You (as a designer)</th>
<th>Other designers</th>
<th>Marketing practitioners</th>
<th>The company</th>
<th>The products/services you design</th>
<th>Consumers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td></td>
<td>Other (please specify):</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

25. Which of these, if any, would benefit from having guidelines advising ways to act/design with environmental labelling in mind?  
(select all that apply)

<table>
<thead>
<tr>
<th></th>
<th>You (as a designer)</th>
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<td>[ ]</td>
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</tr>
<tr>
<td></td>
<td>Other (please specify):</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
26. Which, if any, would benefit from a tool or methodology to ensure that products/services are eligible for specific environmental labels. (select all that apply)

- You (as a designer)
- Other designers
- Marketing practitioners
- The products/services
- The company
- Consumers
- Other (please specify):

Thank you
Thank you for taking the time to complete this survey.

If you would like to receive information about the key findings from this survey, please email me and I shall send you the report once all the data has been collected and analysed.

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If you wish to be contacted about this stage of the research, please state below.

40. Do you wish to be considered for further interviewing?

- Yes
- No

a. Primary contact email: ..................................................

b. Primary phone contact: ...............................................

Environmental Labelling for Designers
Thank you for completing this survey. Your results have been submitted.
Appendix iv: Preliminary Study – Respondent information

Total respondents = 44

Ages:

20-29 = 31  
30-39 = 8  
40-49 = 2  
50-59 = 3

Years working as a designer:

1-2 = 17  
3-5 = 16  
6-10 = 6  
11-20 = 1  
21-30 = 4  
30+ = 0  
Average = 5.86 Years

Type of design currently involved:

Freelance = 4  
In-house = 22  
Consultancy = 10  
No Answer = 8

Type(s) of design previously involved with / experienced:

Freelance = 14  
In-house = 28  
Consultancy = 16  
No Answer = 5
Appendix v: Preliminary Study – Interview prompt sheet

Interviewee ID: …………………. Survey ID (if applicable): ………………….

CONSENT PRIOR TO STARTING INTERVIEW

Thank you for taking the time to participate in my research study. Before we start, are you happy for me to record the interview to transcribe later? You are free to end the interview at any point. All information gathered is to be kept confidential. Do you have any questions?

START

General Design-related Questions:

Q1. To start with could you just talk me through your design process?

Follow-on questions ……………………………………………………………………………
……………………………………………………………………………………………………
……………………………………………………………………………………………………

Q2. Can you please tell me about a typical Design Brief you are asked to work on?

Follow-on questions ………………………………………………………………………
……………………………………………………………………………………………………
……………………………………………………………………………………………………

Q3. Do you use anything to assist you through the design process such as a methodology or a resource?

Follow-on questions ………………………………………………………………………
……………………………………………………………………………………………………
……………………………………………………………………………………………………

□ If you have to find out something specific, such as ergonomic data or information about a material you have not used before, where would you look for that information?

Follow-on questions ………………………………………………………………………
……………………………………………………………………………………………………
……………………………………………………………………………………………………

□ Is there anything that you would want, or you think you would want, in order to enhance either your designs or your design experience?

Follow-on questions ………………………………………………………………………
……………………………………………………………………………………………………
……………………………………………………………………………………………………
Label-specific questions:

☐ Have you had any personal contact with any kind of product labelling through your design work?

Follow-on questions ........................................................................................................................................
........................................................................................................................................................................
........................................................................................................................................................................

☐ What are your attitudes or opinions towards product labelling with regards the environment?

Follow-on questions ........................................................................................................................................
........................................................................................................................................................................
........................................................................................................................................................................

☐ Do you think there is anything that you need or would like to know about environmental labels when you are designing? If yes, how would you like this information to be delivered to you?

Follow-on questions ........................................................................................................................................
........................................................................................................................................................................
........................................................................................................................................................................

☐ Do you think knowing more about environmental labels when designing could benefit the products you design and/or the company? If yes, how?

Follow-on questions ........................................................................................................................................
........................................................................................................................................................................
........................................................................................................................................................................

Questions specific to interviewee based on survey responses:

☐ Survey Question ........................................................................................................................................
........................................................................................................................................................................

☐ Survey Question ........................................................................................................................................
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☐ Survey Question ........................................................................................................................................
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☐ Survey Question ........................................................................................................................................
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☐ Survey Question ........................................................................................................................................
........................................................................................................................................................................
Appendix vi: Main Study – Interview prompt sheet

Participant ID:……………. Preliminary Interviewee (if applicable):………………

CONSENT PRIOR TO STARTING INTERVIEW

Thank you for taking the time to participate in my research study. Before we start, are you happy for me to record the interview to transcribe later? You are free to end the interview at any point. All information gathered is to be kept confidential.

Questions before starting the test:

Q1. What would motivate you to want to find information about environmental labels?

Follow-on questions ………………………………………………………………….. 
…………………………………………………………………………………………
…………………………………………………………………………………………

Q2. Where would you look for that information?

Follow-on questions ………………………………………………………………….. 
…………………………………………………………………………………………
…………………………………………………………………………………………

Q3. I’d like you to assume that you have found this resource through a search engine. What would persuade you to click on the link to enter this resource?

Follow-on questions ………………………………………………………………….. 
…………………………………………………………………………………………
…………………………………………………………………………………………

START OF TEST:

Assuming you have clicked on the link to ‘DEL’ from the results page of the search engine, this is the first page you would come to (Homepage). This shows the various features of the resource. Please select to use as many or as few as you like in the order you think you would if working on a design project.

CHECKLIST

Order of Features Selected:

FAQs ..... CS ..... PS ..... MS ..... LS ..... LDA ..... F&AEE ..... BG ..... 

How first accessed: LI ..... MI ..... 

General Observations
Mouse moving whilst reading?  Yes/No
Asked for feedback before clicking?  Yes/No
Recognised / used the Home Button?  Yes/No
Recognised / used the Back Button?  Yes/No
Recognised hyperlinks to external sources?  Yes/No
Recognised hyperlinked images at page bottom?  Yes/No
Other …………………………………………………………………………………………………
………………………………………………………………………………………………
………………………………………………………………………………………………

**Feature-specific questions (Q) and tasks (T):**

**FAQs**

Q1. Before selecting this feature, what do you anticipate to gain from using it?

T1. Please select and read the first FAQ question.

Q2. What are your thoughts on the amount and depth of information? Is it relevant to you as a designer?

Q3. What are your thoughts on the layout of the information within the feature?

Follow-on questions ……………………………………………………………………………
………………………………………………………………………………………………

**Case Studies**

Q1. Before selecting this feature, what do you anticipate to gain from using it?

T1. Please select and read the first case study.

Q2. What are your thoughts on the amount, type and depth of information? Is it relevant to you as a designer?

T2. Now please select and read the second case study.

Q.3 What are your thoughts on the amount, type and depth of information in this case study in relation to the previous case study? Is it relevant to you as a designer?

Q4. What are your thoughts on the layout of the information within the feature?

Follow-on questions ……………………………………………………………………………
………………………………………………………………………………………………

**Product Selector**

Q1. Before selecting this feature, what do you anticipate to gain from using it?
T1. I’d like you to assume you have been asked to design a specific product e.g. a Kettle. Please show me how you think you would find information about that product from here.

Q2. How was that in terms of finding the product you desired?

Q3. Is the information presented clearly e.g. which labels are compulsory and which are optional?

Q4. Is that information useful or relevant to you as a designer?

T2. If you wanted more information about a specific label, how would you go about that from here?

Follow-on questions ........................................................................................................
........................................................................................................................................

Material Selector

Q1. Before selecting this feature, what do you anticipate to gain from using it?

Q2. I’d like you to assume you are designing a product but have not decided on the specific material to be used. Which option would you use ?

Q3. I’d like you to assume you are designing a product to be made from plywood. Which option would you use to find information about it?

T1. Please demonstrate how you would find information about plywood using the ‘Material Categories’ option.

Q4. How was that process in terms of finding the material requested?

Follow-on questions ........................................................................................................
........................................................................................................................................

Material Information

T1. Please look through the slides you are interested in.

Q1. Is the information presented clearly e.g. which labels are compulsory and which are optional?

Q2. Is that information useful or relevant to you as a designer?

T2. If you wanted more information about a specific label, how would you go about that from here?

Follow-on questions ........................................................................................................
........................................................................................................................................
Label Selector

Q1. Before selecting this feature, what do you anticipate to gain from using it?

Q2. I’d like you to assume you need to find information about a specific label that you know the name of. Which option would you use to find it?

Q3. I’d like you to assume you want to find information about a label you have seen on a competitor’s product but you do not know the name of the label. Which option would you use to find it?

T1. Please demonstrate how you would find information about the Carbon Reduction Label using the ‘View All Labels’ option.

Label Information

T1. Please look through the slides you are interested in.

Q1. Is the information presented clearly?

Q2. Is that information useful or relevant to you as a designer?

T2. If you wanted more information about a specific label, how would you go about that from here?

Label Design Assistant

Explain that the feature has not been fully simulated.

T1. Please read through the various suggestions within the three sections

Q1. Do you have any comments about any of those suggestions?

Forum & Ask An Expert

Q1. Before selecting this feature, what do you anticipate to gain from using it?

Explain the different sections of the Forum (as may be looking at a screenshot).
Q2. Would this kind of information be useful or relevant to you as a designer?

Follow-on questions .................................................................................................................................
..............................................................................................................................................................

Background to Resource

Q1. Before selecting this feature, what do you anticipate to gain from using it?

T1. Please look through the slides you are interested in.

Q2. Is the information presented clearly?

Q3. Is that information useful or relevant to you as a designer?

Follow-on questions .................................................................................................................................
..............................................................................................................................................................

Features not selected:

Just quickly go through each feature not selected during the test to establish reasons behind non-selection.

Q.1 Is there any particular reason why you decided not to select this feature?

[Go through questions specific to feature]

Q2. Now you know what is in the feature, would you have selected to use it if you knew that before?

Follow-on questions .................................................................................................................................
..............................................................................................................................................................
..............................................................................................................................................................
..............................................................................................................................................................

End of test:

Q1. Do you have any comments?

Follow-on questions .................................................................................................................................
..............................................................................................................................................................
..............................................................................................................................................................
..............................................................................................................................................................
..............................................................................................................................................................
**Appendix vii: Details of interviewees in Preliminary and Main Studies (all industrial designers)**

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<tr>
<th>Company</th>
<th>Participant</th>
<th>Sex / Gender</th>
<th>Age</th>
<th>Experience with environmental labels</th>
<th>University design education</th>
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Appendix viii: Main Study – Sample transcription

Transcription of: 4M

Interview conducted: 20/07/2011

36:36 Total

General observations
Mouse moving whilst reading? No
Knew to use HOME button? No
Tried to use BACK button to get home? Yes
Recognised to use BACK button? No (didn’t recognise)
Recognised hyperlinks? No
Used links at bottom of page? No
Other ‘Breadcrumb’ text good

BEFORE STARTING
DH What do you understand by the term environmental labels?

4M Assumed environmental labels indicate environmental impact of a part or product. Disposal used most, so how to dispose of. Plastic parts label the material.

DH Have you ever designed products with environmental labels in mind in the past?

4M No

DH Have you had to apply any labels to products?

4M “Well we have to put things like the WEEE logos on and plastics types on things we design but that is about it. Pretty much just the WEEE one is the one thing I have ever had to do.”

DH “In terms of the information for that label for the WEEE do you understand what the label means and how it affects?

4M “I did, forgotten it all! Probably go looking when I needed to and Google it. Erm, umm, I can’t remember what it means exactly.”

DH Is Google the first place you would go to look for information?

4M “Yeah just Google it, pretty much.” Reoccurring theme

DH “Any particular type of website you would be looking for?”

4M “Anything that looked authoritative. So if I was looking for the WEEE logo information I would probably head to the website of the organisation
behind WEEE which I am guessing is WEEE.org or something. And probably Wikipedia when I use that I trust – I probably shouldn’t trust Wikipedia but do.”

DH  “Is there anything which would inspire you to search for information about labelling unless it was requested?”

4M  “Probably only if it was requested. Um, or we were at the stage at the end of a project where we need to put a label on – just a normal product label – on something and we need to put a CE mark on there, the WEEE mark on there, if it’s a mobile phone you have to put all sorts of numbers. So just when we are at that stage when we have to do a label we would look at it. Sometimes it wouldn’t be us anyway it would be maybe the client depending on how much they are doing or how much we are doing.”

Home Page
OBSERVATIONS
4M  took a long time deciding
Unsure of difference between Product Selector and Materials Selector.
Guessed correctly as to what they are.
General information?

4M  “One of the things I would be looking for is information on the size of the icons. Is that something that I think is defined and I think the WEEE icon or the CE Mark has to be 5mm – maybe it is to do with size? Things there I would want to know (clear on menu screen). Yeah probably those two PS and MS and the LI. DA doesn’t seem as relevant.”
  “I wouldn’t use the forum. I just want the decision then, I want something that is instant. Decision made, done, out the way.” time pressures
  “The FAQ might be useful but I would probably head straight for the label information on the label that I am interested in.”
  “Case Studies again I don’t think I would use that.”

1.PS

DH  Asked to assume design brief is for toaster. Acceptable way to get to that stage?

4M  “Yeah. That is pretty simple. I like this [lists of labels] despite looking at fridges at the weekend and seeing them [energy efficiency labels] I hadn’t thought of an energy label.”
  [overall feature] “Ah that’s interesting. Yeah that works quite well.”

Wanted to know how to get back to the home screen – wasn’t obvious

Wanted to go back to the home screen to click on label information. Only when asked did he thought that he could get info from this screen did he assume that he could click on the image of the label add instruction to images e.g. click here for more info?
OBSERVATIONS
Simple navigation. Easy
Knew to use arrows to see more labels
Wanted to click on image for info

> Uh

4M  “Ah that is a useful. That is a useful way of presenting the information. Knowing like costs and stuff on there is good.

DH  Information on there sufficient?

4M  “Um… I would… I would like, things I would also want to be able to get for a label are the design positioning rules over how you are supposed to place the label on something so the size, position, how much of the surface area it has got to use, things like that. And any files that would be useful for doing it so Bitmap files but vector files would be really important if you are going to emboss the logo onto a part you need the vector files. It is a pain when we get sent logos and stuff in Bitmaps because you just can’t put it onto the part, so files would be important.”

Downloadable images and files (for free to use labels)

DH  Clear layout?

4M  Yes

DH  “Do you think you could make a judgement from the information that is there as to whether that is something you would be interested in pursuing or not?”

4M  “I think so yeah. It is rare that we would, that the sort of optional labels to put on products – especially the ones that cost money – they I think, it is more likely that a client in the know would ask us to put one on a part on the product as a marketing kind of thing for them to tick a box and say ‘we conform to this thing’ and put the logo on the packaging. So that kind of logo is one that they would probably as us to put on where as the required logos, the compulsory ones, we would have to go looking for ourselves and say ‘this needs to go on’.

DH  So how would you know which labels have to be applied to a particular product? Do you rely on the client to tell you that?

4M  “I rely on other people that I work with knowing. Ha ha. I know about the things like the CE Mark, and if it is an electrical product for the [United] States it needs the FCC logo isn’t it, and the WEEE logo on things over here. So I know what we have to put on products, um, but I wouldn’t be able to put the CE Mark on something, obviously you have got to get it CE Marked in the first place, and if it’s an electrical product the electrical guys would will do that and go through the process of getting it CE Marked and you just have to put it on there. So yeah.”
OBSERVATIONS
Read 3

TO ADD: Essential info: Size & position of label
Download of logo files in various formats

2. MS

4M “Is this [to] select a material for use? I don’t think I would use this. From the link on the front page I wasn’t sure what this was going to be. I thought it might be a way of picking a label based on material so it would tell you extra labels you had to put on certain things. I don’t think I would use this tool or come to this tool looking to pick a material, I would have come to it looking for a label. So at this stage I would probably go back and try something different.” Change wording?

DH Asked to find specific material

4M SAM or LAMA. “I think if there were categories there, the category I would be looking for is ‘wood’. So I would be looking for a wood / metal / plastic / ceramic, those categories to drill down it.

DH Asked to select Material Categories

4M “Ah yes!”

DH “So is that what you expected to see on that previous screen? [main MS screen]

4M “Yeah. And then I would …” proceeds to find example with ease. “Yeah that works very well, but I think I would have expected that on the front page because that is what I would have been looking for.”

OBSERVATIONS
Not sure if material feature needed
Not used to find a material
SAM or LAMA
Look for categories

Asked to go to MC on previous screen (wanted on front page)

DH MI

4M “Yeah this would be useful [MI?]”

DH “So in terms of the information on those two slides

4M “Yeah that is exactly what you would be looking for. Yeah having these as labels that you can then click through and would link you to what those other links before were [Label Info] that is exactly what you would be looking for.”

DH Layout?
4M Have all labels on one page “...and maybe have a little paragraph or sentence of what the label means very very briefly. So you are not quite sure which is the right label but you can pretty much get it from one sentence and seeing the picture. I think that would be very useful, just a list of all labels with a little bit next to each one.”

*Knew to click on hyperlinks for more information*

DH Asked if any other features he would want to look at

4M “I think that is what I would be looking for, ‘something to help me find a label’, ‘information about a label’. The other things I wouldn’t find useful I don’t think. It’s one of those things where ‘you have got to put a label on something, you have got to do it and you want to do it quick and out the way, done.’.”

END OF SELECTED FEATURES

**FAQs**

DH Asked to read first question

4M “I think I said in the beginning the FAQ one was something I would possibly look at and I think it is worth having on there but it is not something that I’d generally go for, but if I wanted a little bit more information and had some time to look at it it would be a useful thing to have.” *Felt they had insufficient time to look at it*

DH Information sufficient quantity?

4M “Yeah I think so”

DH Layout clear to understand?

4M “Yeah”

**CS**

DH Asked to read Dyson example. “Is that information interesting or relevant to you as a designer?”

4M “Um, it is interesting, I think it probably is relevant because it, the Carbon Trust Carbon Reduction Label isn’t a label I’d come across or known about. That [the Case Study] has told me it exists and that people can use it for marketing (laughed). I think it is useful but I wouldn’t have gone looking for it.”

DH Asked to read Walkers example and how the information compares.
4M “Case studies on labels are actually I can see one now make sense. But I wouldn’t have clicked through to Case Studies. I don’t know whether there may be a better way of presenting to people the idea of other labels when they are on there on that website there might be some way of presenting alternative labels and sort of trying to sell them. This is what [unaudible] is doing isn’t it really, it is trying to sell people another label to use on a product and, um, there might be a better way of doing it because I don’t think I would click on Case Studies.”

DH Any piece of information on there the most significant to you as a designer?

4M “I don’t think so.”

LDA

SDP 4M “[An advice guide is] probably a useful thing to have on there and there probably are people who would go on it, I probably wouldn’t.”

DDP 4M Don’t think it is needed as probably wouldn’t use. (seemed to think (although did not explicitly say this) that it only tells the designer what labels they should be using, rather than the information from the label guidelines that could/should be considered from the awarding criteria

ADP 4M “I can see a tool where you put in the details of your product and it gives you a list of suitable labels. That kind of could happen at any of those three stages. It is just one tool that you could use when whenever because you know what the product is going to be, it doesn’t need to be broken down into those three stages (simplify feature) and the Placement Advisor would be useful but yeah I would be looking for that under each label because each label has its own rules on, especially like the CE Mark and WEEE mark.”

OBSERVATIONS

SDP Maybe useful but not for them
DDP Wouldn’t use
ADP A) Can be used at any time
   C) Would want that information for each label as different

F&AAE

DH Is there a reason why you wouldn’t use?

4M “Um, I don’t think I need to. If I’ve got a question over something that I can’t find I would, before going to the Forum or going through the website, I would talk to colleagues to get an idea and yeah I don’t necessarily think if you need to keep, the Forum could be useful but I don’t think it is going to be particularly busy, you’re not going to build up a community around the Forum, it is just a place to go and ask some questions and then other people can go on Google and people search something it might come up with your Forum if someone has asked a question before. If your expert is active on the Forum at answering
questions then that is useful. But yeah I don’t use forums to get advise on how to design things and do things like that, I will use Google or something to get an idea of what you are suppost to do, you find a forum post that someone has written but I wouldn’t go on there myself.”

OBSERVATIONS/NOTES
Don’t need to
Talk to colleagues instead
Won’t have a community feel
Google search to find previous questions

BG
Read all without prompting

DH  Is any of that information interesting or relevant to you as a desisnger?

4M  “Um, it is interesting to know about where this resource came from but I wouldn’t find it useful. It is useful to know that the resource is legitimate so by having the [Loughborough] University logo fairly prominently on there as this is a project of Loughborough it is a useful thing to indicate but it is legitimate but I don’t think I need to know or go looking for finding out how it was developed.”

END OF FEATURES

DH  “Do you have any final questions or comments about the resource overall or any specific features?”

4M  “It will certainly be useful. The thing I would actually find very useful is somewhere to get the artwork for logos and labels and a design guide for each one telling you what you should do and what you have to do for each logo. I think that is what I would find most useful. As a single place to find the Illustrator files for each logo, that is what I would want.”

4M  “I think to be a bit of a cynic a lot of the environmental logos I think are mostly used for marketing purposes. All the optional ones or all the ones where you pay money, they are good but they are encouraging people as a side effect to follow the rules of the logo so that they do do things more green but ultimately the reason why they have been done is that the return on investment of going with it will have meant that they will have sold more of their product isn’t this how business work for profit? So I think if you swap your ‘tool for designers’ but its probably marketers within companies who need to be exposed to the labels to really drive the use of them within organisations rather than the designers themselves because it is the marketers that have the power to say ‘I want to put this label on this product that we are doing ’ so maybe something like this but really pushing it towards marketers might be a useful thing.”

DH  “In terms of trying to sell this to marketing people to try to convince them to use it what kind of information would you want to give them about it?”
"I have no idea. But I think the trouble is that you would have to, you would need to sell the idea of having an environmental label on a product to a marketer you need to show that it is going to help them sell more products. So a way of presenting that to them would be good but I am not a marketer, so I don’t know. It could be an interesting sort of extension of this [current resource for designers] to look into that and whether it is actually a good idea, I might be completely wrong! But I think the cynic in me says that they are used for marketing purposes and exposing the marketers rather than the designer could be key. Because I have been looking just at how to use it, to check that I am using the right one [labels] for the compulsory ones and the optional ones that would tend to come from marketing I think.
Appendix ix: Case Study – Interview Prompt Sheet

Semi-structured Interview prompt sheet for Case Study participants

COMPANY B
INTERVIEW WITH: Product Development Manager / QA Manager

- Company structure of design team
- I see you have a range of products with FSC label on
  - Who’s idea to use FSC label?
  - Who’s decision to use FSC label?
  - Where did your company get information about FSC label from?
  - Did you contact FSC before or during design process?
  - Can you describe the design process for the FSC labelled products?
  - Is this different to the design process for your other products?
- Role of designers in this
  - At what stage were they told about the FSC label to be applied, if any?
  - Were they given information about what would be involved or did they find information for themselves?
- Following your experiences, would you consider using FSC or other labels on your products again?
- Have you used any other environmental labels on your products and/or packaging? E.g. recycling symbols
- Further data collection
  - Would it be possible to interview others involved in the design process within your company?
  - Possibility of using your company and/or product(s) as a case study in thesis?
Appendix x: Sample of cut and paste method of clustering

CASE STUDIES

ORDER USED:

1st 1H
2nd 3M
3rd 1K
4th 2B, 2M
5th 1J
6th 1M
7th
8th

Not selected 1L, 1B, 4M

EXPECTATIONS BEFORE USE OF FEATURE

‘Case studies would be really interesting certainly to look into the actual benefits of using those labels because sometimes you might need to convince a client or your boss that that is the way to go forward.’ (1J)

1M scanned the first example and left feature after a few seconds Yet when asked to revisit and read the information in depth, user made positive comments about the contents

ISSUES OF PERCEPTION

IS IT NEEDED?

Before use 1N said ‘…with Case Studies I don’t think I need to be [here], the fact that I am even here and I am even reading this kind of implies that I have already bought into environmental labelling, that I don’t need to be persuaded by it because I already think it is a good thing, it is why I Googled it in the first place. Might be some interesting bedtime reading I guess and for other companies that might persuade them to start doing it.’ (1N)

However, he then went on to say

‘What I would be interested to see though I guess actually from that [CS Feature] is if companies have suddenly made more money by carbon labelling or their public profile has gone up because of their labelling. Personally as a consumer it is not something that I have ever been too aware of.’ (1N)

CONTENTS – INFORMATION – TYPE

‘Percentage figures I guess really as 6g of CO2 doesn’t really mean anything to me. A fiscal or financial figure is much more tangible. But I guess if your involved in more sustainable design then you might have a good idea of what 6grams is.’ (1H)

FOLLOWED BY ‘So I guess maybe a percentage figure is useful to know. I guess that could be considered quite substantial reduction but I guess for them
the incentives might be and for a lot of companies the incentive would be more a financial figure as if they could reduce costs then usually that would result in a change in design.’ (1H)

‘The fact that the example shows how much money they managed to save is good information.’ (1J)

From personal experience, evidence that any design changes or such developments to a product would likely be financially beneficial helped to persuade boss / clients.

Wanted a big financial figure to stand out and say what the label has done.

Company they worked for previously considered anything sustainable as a cost to them. So any evidence would help designers to show what application of label could achieve. (1J)

“It’s good to show the cost benefit which I suppose is the most important thing.”

(1L)

% OF CARBON Vrs COST

DH “As a designer would you be interested in the percentage of carbon that they have saved or would the money-side of it…”

2B “Oh the money would be more [interesting] probably to the designer.”

BRAND NAME OF COMPANY WHO ALREADY USING LABEL

1B “I think it’s more that it’s the brand name and if that brand name has done something and you know that brand and in some way your company is in a similar market sector then it would be the name that would influence you to do it moreso than maybe the amount it cost.” Looking to others to lead the way

“I think that is really good having how much it saved because I can see the company getting on board with that. And it says that they have retained the use of their label, maybe slightly more detail on how they have retained it. I mean is it because they are a massive name it does the Carbon Trust good to have it on Walkers? (1M)

COMPARISON

2M“Cool. OK that is all good, I don’t know what a conventional hand-dryer emits so it is nice to compare it to television but I would also compare it to your average one [hand-dryer] that you get in a normal gents [toilets] because if that might be roughly the same or it might be ten-times [better], I don’t know because I’ve got no qualification for it.”

DH “That is the 80% there, but you think that should be – it is not clear that that is linked to that?”

2M “Yeah you might want to just back that up straight away with a comparison is my thought.”

COMPARISON WITH COMPETITORS AND OTHER PRODUCTS

DYSON AIRBLADE CASE STUDY ‘Yeah because you can see, it makes comparisons between existing things and this thing and also something that is
not in the same category like the television. It is still quite shocking that it is quite a lot of energy.’ (3M)

MOST IMPORTANT
DH What is key information if only one could be displayed?
3M “I wouldn’t perhaps be so interested in the actual kilograms of CO2 but more the analogy. Analogy is a lot more, I mean you can do the maths, but it is a lot more understandable to relate to something else, so I think the analogy is probably the most useful thing.”

CONTENTS – INFORMATION – INTERESTING

‘Yeah it’s good. I guess it’s kind of in a way background information to the products that you might use. The first thing is the product themselves and then the environmental and sustainable [information] that you don’t always get. It’s not the first thing you notice but it is interesting to find out more about that.’ (1H)

‘as a designer it is definitely interesting that they have made that effort to improve the product by reducing the emissions or reduce the footprint.’ (1H)

Interesting, but is it inspiring?

“Yeah I find that interesting. I’m not a massive fan of the Airblade but it is quite interesting. I don’t really think that it doesn’t have a heating element and I can see why that would make it more [energy] efficient.” (1L) Interesting, but is it inspiring?

“Hmm… If I was designing another hand dryer that would be interesting. I’m not sure it would be relevant if I was wanting to design a kettle. But it does show that they are… …backing up their case having that label so it is like it is more environmentally [friendly], it produces less CO2, but Dyson are also committed over the next two years to reduce that further. So it is putting the label into context which I suppose is useful.” (1L)

DH “So in terms of the information that is on there do you think that is particularly relevant or interesting to you as a designer?”
2M “I think it is because this is one of the optional ones [labels] so it is nice to see where it has been used. Yeah I think that [Dyson Airblade] is a decent case study.” (2M)

WALKERS CASE STUDY
DH Asked if information was interesting and/or relevant to them as a designer.
2B “I’d say it is interesting. Actually I would say it is better than that, I mean it is different - it is food though - but it is still quite interesting because it is per weight and a lot of what you do when you make stuff is how much mass is it, how much does it weigh and stuff and if you can think of ways to reduce that.” He can relate to stuff like air miles which is quite useful.
DYSON CASE STUDY ‘You can use that information to justify the need for it [environmental label].’ (1J) justify to who? Designers? Company? Client?

Information backs up the benefit of labels by seeing them in use on products and the comparisons made to rival products with facts and figures. (1K)

DH ‘To clarify, you’re saying that from a designers’ point of view knowing the carbon emissions saved more important than money saved’

1K ‘From a designer’s point of view yes, but then it depends whether it’s a consumable product that someone is going to buy on a daily basis or if it is going to be a business. So it is much better with the Walkers one because you can work out how much a packet of crisps is and you can work out the cost savings on a whole where as the other one you need figures that then you can then link into sales of a large company. So a mix of the two depending upon which product is in the case study.’

ABOUT THE AIRBLADE “Hmm… If I was designing another hand dryer that would be interesting. I’m not sure it would be relevant if I was wanting to design a kettle. But it does show that they are…. …backing up their case having that label so it is like it is more environmentally [friendly], it produces less CO2, but Dyson are also committed over the next two years to reduce that further. So it is putting the label into context which I suppose is useful.” (1L)

DH “So in terms of the information that is on there do you think that is particularly relevant or interesting to you as a designer?”

2M “I think it is because this is one of the optional ones [labels] so it is nice to see where it has been used. Yeah I think that [Dyson Airblade] is a decent case study.” (2M)

“Um, it is interesting, I think it probably is relevant because it, the Carbon Trust Carbon Reduction Label isn’t a label I’d come across or known about. That [the Case Study] has told me it exists and that people can use it for marketing (laughed). I think it is useful but I wouldn’t have gone looking for it.” (4M)

**DIDN’T SELECT FEATURE** Important as made designer aware of a label and how it could be used – information they would not have looked for.

Designer 1N seemed to suggest that it was down to the individual designer to convince others in their company to use environmental labels, and that the best way to convince them would be to use facts from existing products/companies about monitary savings followed by potential increased sales.

1N No difference between the two lots of information. “I think both angles [taken in case study examples] are useful because if you are trying to prove to your boss that you think that you should get a sustainable labelling then you need all the information. They may well say ‘ah but you’re not making a saving for the company’ or ‘you are making a saving for company x’, but the label is also a selling point for consumer y.”
DH  Savings Vrs increased sales??
1N  “Think they are equal, and think they are equal for our company as well. If it is something we can sell the product on, great. If it is using it internally to save money, that is the first step I think. You have got to prove what your carbon footprint is to start off with, and that is difficult enough without adding marketing into it.”

CONTENTS – INFORMATION – RELEVANT/USEFUL TO COMPANIES

2B “Yes it’s very good yeah. It gives you an idea of what reductions can be made. Probably a lot of companies do not really realise how much they can save on emissions and that.”
DH  “Is there anything on there that you find particularly important or that you would look for as being the most important piece of information?”
2B  “I would say again what the reduction would be. Definitely sort of stating what they have managed to achieve, and hopefully other companies can achieve similar.” (2B)

“It is because they are obviously leading companies and so they are showing the way and everyone is going to have to follow at some point so you need to know what is happening and our company is never going to be at the forefront of changing people and saving the environment and those sort of, we are going to have to follow when other people do it so it is good to know.” (1B)

”I think that is really good having how much it saved because I can see the company getting on board with that. And it says that they have retained the use of their label, maybe slightly more detail on how they have retained it. I mean is it because they are a massive name it does the Carbon Trust good to have it on Walkers?” (1M)

“Possibly not a big company but there might be other small companies that go through the process that you are talking about that maybe don’t even have a label but do things in an eco way. I think there is a company in London somewhere… So it would just be interesting to know what kind of process is used, and this is a good background to that, and like I say, having the monitory incentives is brilliant because I can see people [companies] getting on board with that but then you almost have to be on this website to see that.” (1M)

CONTENTS – INFORMATION – RELEVANT/USEFUL TO CONSUMERS

‘Consumers can relate the savings made to the product they are buying as they know how much the product costs e.g. a packet of crisps is to the overall saving. Whereas other products such as the hand dryer is a convenience, its something they may use and can appreciate the energy efficiency. In terms of a cost e.g. an electricity saving, they perhaps wouldn’t have much interest. Possibly the same with the designer as well?’ (1K)
‘But yeah definitely it is interesting for me but I don’t know how much the consumer would care about it and like they probably see that and maybe glance at but they didn’t understand this back information perhaps.’ (3M)

**CONTENTS – INFORMATION – AMOUNT/DEPTH**

Information ‘definitely sufficient in there.’ (1K)

**ABOUT WALKERS CASE STUDY** ‘It has a really nice strapline to it. As a designer you always need to know who is the first to dip their toe into the water because then you can see how they are doing, so other brands can see their facts and the statistics that they have come out with having this logo on the product.’ (MP03)

**CONTENTS – INFORMATION – AMENDMENTS**

MAKE IT CLEAR THAT COMPANIES WORKED WITH CARBON TRUST FROM THE BEGINNING OF THE DESIGN PROCESS

2M “OK, I would make it clear that they worked with the Carbon Trust from the start then to make sure that it had minimal impact because I don’t think it makes that totally clear. It could have just been that the designers were switched on and they made it really low impact and then they went to the Carbon Trust and the Carbon Trust went ‘yeah that’s fine, here’s an award’ rather than it was a collaboration at the very start of the process.”

DH “Yeah they wanted to make the most efficient dryer they could [and was on the market] so they approached the Carbon Trust and the Energy Saving Trust and they said that the Carbon Trust was the label that they wanted to be awarded to it.”

2M “OK then, I would say that in the case study then. I would say that from the very start they approached them and they have wanted to be one of the prime USP’s in the market place it is going to be, we want to be the lowest energy-usage dryer and therefore that collaboration, because then I might have that as a want on my project and therefore I would then give the Carbon Trust a call as they are a team of industry experts who can help me achieve that.”

**CONTENTS – INFORMATION – PRESENTATION**

KEY DATA / STATS LOST IN PARAGRAPH OF TEXT E.G.

2M “Cool. OK that is all good, I don’t know what a conventional hand-dryer emits so it is nice to compare it to television but I would also compare it to your average one [hand-dryer] that you get in a normal gents [toilets] because if that might be roughly the same or it might be ten-times [better], I don’t know because I’ve got no qualification for it.”

DH “That is the 80% there, but you think that should be – it is not clear that that is linked to that?”

2M “Yeah you might want to just back that up straight away with a comparison is my thought.”
Make clearer by having key stats in bullet points? Or highlight with bold text or underline? Avoid changes of colour though

“Case studies on labels are actually I can see one now make sense [after reading Walkers example]. But I wouldn’t have clicked through to Case Studies. I don’t know whether there may be a better way of presenting to people the idea of other labels when they are on there on that website there might be some way of presenting alternative labels and sort of trying to sell them. This is what [inaudible] is doing isn’t it really, it is trying to sell people another label to use on a product and, um, there might be a better way of doing it because I don’t think I would click on Case Studies.” (4M)

An alternative way of imparting this information without using Case Studies (such as??)

Decision not to “sell” the idea of using a particular label made to maintain impartiality of resource (although I guess the aim of the website is ultimately to encourage the use of environmental labels in general).

CONTENTS – INFORMATION – ABSENT DESIRED

THE APPLICATION PROCESS? HOW THIS INFLUENCED THE DESIGN PROCESS, IF AT ALL?

“That is good in that showing you what a company has done. But what would be interesting again is the process that they went through. I don’t know what information is available from Dyson and the Carbon Trust on that? Its good as a background but whether I would use any of it practically I don’t know. I probably would just look at this to see what the website is about rather than actually using it to help, but it is still good and gives you all the information.” (1M)

“Possibly not a big company but there might be other small companies that go through the process that you are talking about that maybe don’t even have a label but do things in an eco way. I think there is a company in London somewhere… So it would just be interesting to know what kind of process is used, and this is a good background to that, and like I say, having the monitory incentives is brilliant because I can see people [companies] getting on board with that but then you almost have to be on this website to see that.” (1M)

MOTIVATION FOR COMPANIES TO APPLY A SPECIFIC LABEL (TRUE REASON OR WHAT THEY WOULD LIKE TO LET CONSUMERS THINK?)

NAVIGATION WITHIN FEATURE

1K Also recognises the hyperlinks and knows they will take him to the Dyson website. Again recognised the links to the external sites e.g. carbon Trust.

1N skimmed through both case studies in a few seconds
Appendix xi: Main Study – Feedback Survey

User Feedback Survey
Thank you for taking the time to test the environmental label resource for designers. Could you please complete this feedback survey to further assist with the development of the ‘DELR’ resource. It should take no longer than 10 minutes to complete.

Some questions have ‘More Info’ boxes on the right. Clicking on this will provide more information about the question. Your answers will only be submitted once the whole survey is completed.

Data Protection Information

All information gathered through this study will be kept private and confidential. It will only be available to me and other select research associates.

About you
This information will not appear on any work and will only be available to myself for reference purposes.

1. Please enter your participant ID

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Features of the Resource
Questions on each of the resource’s features.

Background

2. Rate the ease of use for this feature on a scale of 1 to 5 (1 = Poor, 5 = Excellent)

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3. Please rate the relevance / usefulness of feature to your work as a designer on a scale of 1 to 5 (1 = ‘No Relevance / Use’, 5 = ‘Extremely Relevant / Useful’)
4. Were you able to find the information you wanted from this feature?

- All
- Most
- Some
- None

What information could you not find that you required, if any? *(Optional)*

Frequently Asked Questions

5. Rate the ease of use for this feature on a scale of 1 to 5 (1 = Poor, 5 = Excellent)

- 1
- 2
- 3
- 4
- 5

6. Please rate the relevance / usefulness of feature to your work as a designer on a scale of 1 to 5 (1 = ‘No Relevance / Use’, 5 = ‘Extremely Relevant / Useful’)

- 1
- 2
- 3
- 4
- 5

7. Were you able to find the information you wanted from this feature?

- All
- Most
- Some
- None

What information could you not find that you required, if any? *(Optional)*

Label Selector
8. Rate the ease of use for this feature on a scale of 1 to 5 (1 = Poor, 5 = Excellent)

[ ] 1  [ ] 2  [ ] 3  [ ] 4  [ ] 5

9. Please rate the relevance / usefulness of feature to your work as a designer on a scale of 1 to 5 (1 = ‘No Relevance / Use’, 5 = ‘Extremely Relevant / Useful’)

[ ] 1  [ ] 2  [ ] 3  [ ] 4  [ ] 5

10. Were you able to find the information you wanted from this feature?

[ ] All  [ ] Most  [ ] Some  [ ] None

What information could you not find that you required, if any? (Optional)

[ ]

11. Rate the ease of use for this feature on a scale of 1 to 5 (1 = Poor, 5 = Excellent)

[ ] 1  [ ] 2  [ ] 3  [ ] 4  [ ] 5

12. Please rate the relevance / usefulness of feature to your work as a designer on a scale of 1 to 5 (1 = ‘No Relevance / Use’, 5 = ‘Extremely Relevant / Useful’)

[ ]
13. Were you able to find the information you wanted from this feature?

- [ ] All
- [ ] Most
- [ ] Some
- [ ] None

What information could you not find that you required, if any? *(Optional)*

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**Product Selector**

14. Rate the ease of use for this feature on a scale of 1 to 5 (1 = Poor, 5 = Excellent)

- [ ] 1
- [ ] 2
- [ ] 3
- [ ] 4
- [ ] 5

15. Please rate the relevance / usefulness of feature to your work as a designer on a scale of 1 to 5 (1 = ‘No Relevance / Use’, 5 = ‘Extremely Relevant / Useful’)

- [ ] 1
- [ ] 2
- [ ] 3
- [ ] 4
- [ ] 5

16. Were you able to find the information you wanted from this feature?

- [ ] All
- [ ] Most
- [ ] Some
- [ ] None

What information could you not find that you required, if any? *(Optional)*

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**Material Selector**
17. Rate the ease of use for this feature on a scale of 1 to 5 (1 = Poor, 5 = Excellent)

1  2  3  4  5

18. Please rate the relevance / usefulness of feature to your work as a designer on a scale of 1 to 5 (1 = ‘No Relevance / Use’, 5 = ‘Extremely Relevant / Useful’)

1  2  3  4  5

19. Were you able to find the information you wanted from this feature?

All  Most  Some  None

What information could you not find that you required, if any? (Optional)

---

Material Information

20. Rate the ease of use for this feature on a scale of 1 to 5 (1 = Poor, 5 = Excellent)

1  2  3  4  5

21. Please rate the relevance / usefulness of feature to your work as a designer on a scale of 1 to 5 (1 = ‘No Relevance / Use’, 5 = ‘Extremely Relevant / Useful’)
22. Were you able to find the information you wanted from this feature?

All  Most  Some  None

What information could you not find that you required, if any? (Optional)

Case Studies

23. Rate the ease of use for this feature on a scale of 1 to 5 (1 = Poor, 5 = Excellent)

1  2  3  4  5

24. Please rate the relevance / usefulness of feature to your work as a designer on a scale of 1 to 5 (1 = ‘No Relevance / Use’, 5 = ‘Extremely Relevant / Useful’)

1  2  3  4  5

25. Were you able to find the information you wanted from this feature?

All  Most  Some  None

What information could you not find that you required, if any? (Optional)

Forum & ‘Ask an Expert’
26. Rate the ease of use for this feature on a scale of 1 to 5 (1 = Poor, 5 = Excellent)

| 1 | 2 | 3 | 4 | 5 |

27. Please rate the relevance / usefulness of feature to your work as a designer on a scale of 1 to 5 (1 = ‘No Relevance / Use’, 5 = ‘Extremely Relevant / Useful’)

| 1 | 2 | 3 | 4 | 5 |

28. Were you able to find the information you wanted from this feature?

- All
- Most
- Some
- None

What information could you not find that you required, if any? *(Optional)*

---

**Resource as a whole**

A few questions about your experience of using the prototype environmental labelling resource for designers.

**Appearance**

29. Please rate the overall appearance of the resource on a scale of 1 to 5 (1 = Poor, 5 = Excellent)

| 1 | 2 | 3 | 4 | 5 |

Are there any changes you would suggest be made to improve the overall appearance of the resource, if any? *(Optional)*

30. Please rate how clearly the information is presented on a scale of 1 to 5 (1 = Poor, 5 = Excellent)
Layout and Navigation

31. Please rate the design and layout of the resource on a scale of 1 to 5 (1 = Poor, 5 = Excellent)

32. Please rate the ease of navigation through the resource on a scale of 1 to 5 (1 = Poor, 5 = Excellent)

Overall resource

Resource and the Design Process

33. Which stage(s) of the product development process do you think this resource would be beneficial to, if any? (select all that apply)
**Resource and You**

34. If available, would you use this resource again when designing in the future?

<table>
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</thead>
</table>

If yes, which feature(s) do you think you would use again? *(Select all that apply)*

- [ ] Background (to research project and resource)
- [ ] Frequently Asked Questions
- [ ] Label Selector
- [ ] Label Information
- [ ] Product Selector
- [ ] Material Selector
- [ ] Material Information
- [ ] Case Studies
- [ ] Forum & ‘Ask an Expert’

---

35. Would you visit the resource again in the future for personal research?

<table>
<thead>
<tr>
<th>Yes</th>
<th>Maybe</th>
<th>No</th>
</tr>
</thead>
</table>

---

**Resource and other designers**

36. If available, would you recommend other designers visit the resource during their professional work?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Unsure</th>
</tr>
</thead>
</table>

If yes, which feature(s) would you recommend? *(Select all that apply)*

- [ ] Background (to research project and resource)
- [ ] Frequently Asked Questions
- [ ] Label Selector
- [ ] Label Information
Thank you
Thank you for taking the time to complete this survey.

If you would like to receive information about the key findings from this survey, please email me and I shall send you the report once all the data has been collected and analysed.

Daniel Horne  cddmh@lboro.ac.uk

Further research
Following the completion of this stage of testing the plan is for a number of designers to use the resource on design tasks. These will either be a brief design simulation (at Loughborough Design School or your place of work) and/or have the resource available for you to work with on real life design projects.

If you would like more information about this stage of the research or to be considered as a subject, please indicate below.

(Your contact details will not be shared with any other person / company and is recorded separate from your answers to maintain anonymity)

39. Do you wish to receive further information or be considered for the final stage of testing?

☐ Yes  ☐ No

Primary contact email: 

Primary phone contact: (Optional)
Final Page
Thank you for completing this survey. Your results have been submitted.
Appendix xii: Main Study – Results from feedback survey

1H, 1J, 1K, 1L, 2B, 1B, 1M, 1N, 1A, 4A, 1C

TOTAL 11 (out of 16) 68.75%

FEATURES

Background

2. Rate the ease of use for this feature on a scale of 1 to 5 (1 = Poor, 5 = Excellent)

<table>
<thead>
<tr>
<th>Rating</th>
<th>Percentage</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>9.1%</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>36.4%</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>54.5%</td>
<td>6</td>
</tr>
</tbody>
</table>

TOTAL: Mode = 5

Median = 5

Mean = 4.09

Range = 3

3. Please rate relevance / usefulness of feature to your work as a designer on a scale of 1 to 5 (1 = 'No Relevance / Use', 5 = 'Extremely Relevant / Useful')

<table>
<thead>
<tr>
<th>Rating</th>
<th>Percentage</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>18.2%</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>45.5%</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>27.3%</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>9.1%</td>
<td>1</td>
</tr>
</tbody>
</table>

TOTAL: Mode = 3

Median = 3

Mean = 3.27

Range = 4

4. Were you able to find the information you wanted from this feature?

<table>
<thead>
<tr>
<th>Option</th>
<th>Percentage</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>63.6%</td>
<td>7</td>
</tr>
<tr>
<td>Most</td>
<td>36.4%</td>
<td>4</td>
</tr>
<tr>
<td>Some</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>None</td>
<td>0.0%</td>
<td>0</td>
</tr>
</tbody>
</table>

TOTAL: Mode = All

Median = All

Range = 2

4a. What information could you not find that you required, if any?

1N: "peer and site review of the worth of the label in consumers eyes"

Frequently Asked Questions

5. Rate the ease of use for this feature on a scale of 1 to 5 (1 = Poor, 5 = Excellent)

<table>
<thead>
<tr>
<th>Rating</th>
<th>Percentage</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>9.1%</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>45.5%</td>
<td>5</td>
</tr>
</tbody>
</table>
### Feature Relevance / Usefulness

<table>
<thead>
<tr>
<th>Scale</th>
<th>Percentage</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9.1%</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>63.6%</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>27.3%</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total:** Mode = 4 & 5  
Median = 4  
Mean = 4.36  
Range = 3

6. Please rate relevance / usefulness of feature to your work as a designer on a scale of 1 to 5 (1 = 'No Relevance / Use', 5 = 'Extremely Relevant / Useful')

### Information Findability

<table>
<thead>
<tr>
<th>Rating</th>
<th>Percentage</th>
<th>No Responses / Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9.1%</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>9.1%</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>27.3%</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>45.5%</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>45.5%</td>
<td></td>
</tr>
</tbody>
</table>

**Total:** Mode = 5  
Median = 5  
Mean = 4.27  
Range = 4

7. Were you able to find the information you wanted from this feature?

### Ease of Use

<table>
<thead>
<tr>
<th>Scale</th>
<th>Percentage</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>9.1%</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>9.1%</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>27.3%</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>54.5%</td>
<td>6</td>
</tr>
</tbody>
</table>

**Total:** Mode = 5  
Median = 5  
Mean = 4.27  
Range = 4

8. Rate the ease of use for this feature on a scale of 1 to 5 (1 = Poor, 5 = Excellent)

9. Please rate relevance / usefulness of feature to your work as a designer on a scale of 1 to 5 (1 = 'No Relevance / Use', 5 = 'Extremely Relevant / Useful')
10. Were you able to find the information you wanted from this feature?

<table>
<thead>
<tr>
<th></th>
<th>All</th>
<th>54.5%</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most</td>
<td>18.2%</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Some</td>
<td>27.3%</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>0.0%</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

10a. What information could you not find that you required, if any?

1A: “Simplify the contents/navigation page... too many options”

Label Information

11. Rate the ease of use for this feature on a scale of 1 to 5 (1 = Poor, 5 = Excellent)

<table>
<thead>
<tr>
<th></th>
<th>4</th>
<th>36.4%</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>63.6%</td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>

12. Please rate relevance / usefulness of feature to your work as a designer on a scale of 1 to 5 (1 = 'No Relevance / Use', 5 = 'Extremely Relevant / Useful')

<table>
<thead>
<tr>
<th></th>
<th>3</th>
<th>9.1%</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>36.4%</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>54.5%</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

13. Were you able to find the information you wanted from this feature?

<table>
<thead>
<tr>
<th></th>
<th>All</th>
<th>27.3%</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most</td>
<td>54.5%</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Some</td>
<td>18.2%</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>0.0%</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

355
Range = 3

13a. What information could you not find that you required, if any?

1H: "how does it impact the consumers purchase?"
1N: "peer review / website maintainers review critical"
1A: "split information given into ‘fact’ and ‘opinion’ - currently mixed, making fact extraction more difficult"

Product Selector

14. Rate the ease of use for this feature on a scale of 1 to 5 (1 = Poor, 5 = Excellent)

<table>
<thead>
<tr>
<th>Rating</th>
<th>Percentage</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9.1%</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>18.2%</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>57.3%</td>
<td>5</td>
</tr>
</tbody>
</table>

TOTAL: Mode = 5
Median = 5
Mean = 4.64
Range = 3

15. Please rate relevance / usefulness of feature to your work as a designer on a scale of 1 to 5 (1 = 'No Relevance / Use', 5 = 'Extremely Relevant / Useful')

<table>
<thead>
<tr>
<th>Rating</th>
<th>Percentage</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9.1%</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>27.3%</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>53.8%</td>
<td>7</td>
</tr>
</tbody>
</table>

TOTAL: Mode = 5
Median = 5
Mean = 4.54
Range = 3

17. Were you able to find the information you wanted from this feature?

<table>
<thead>
<tr>
<th>Information Found</th>
<th>Percentage</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>54.5%</td>
<td>6</td>
</tr>
<tr>
<td>Most</td>
<td>27.3%</td>
<td>3</td>
</tr>
<tr>
<td>Some</td>
<td>18.2%</td>
<td>2</td>
</tr>
<tr>
<td>None</td>
<td>0.0%</td>
<td>0</td>
</tr>
</tbody>
</table>

TOTAL: Mode = All
Median = All
Range = 3

17a. What information could you not find that you required, if any?

1J: "Make the compulsory labels all visible (none hidden)"
1M: "Could do with list of all products/ search bar"
1N: "more products and packaging"
1A: "the product selector works well for the categories given, but i wonder how the graphic navigation will work when expanded to include ALL product categories!"
Material Selector

18. Rate the ease of use for this feature on a scale of 1 to 5 (1 = Poor, 5 = Excellent)

<table>
<thead>
<tr>
<th>Rating</th>
<th>Percentage</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>9.1%</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>9.1%</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>36.4%</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>45.5%</td>
<td>5</td>
</tr>
</tbody>
</table>

**TOTAL:**
- Mode = 5
- Median = 4
- Mean = 4.18
- Range = 4

19. Please rate relevance / usefulness of feature to your work as a designer on a scale of 1 to 5 (1 = ‘No Relevance / Use’, 5 = ‘Extremely Relevant / Useful’)

<table>
<thead>
<tr>
<th>Rating</th>
<th>Percentage</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>9.1%</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>36.4%</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>54.5%</td>
<td>6</td>
</tr>
</tbody>
</table>

**TOTAL:**
- Mode = 5
- Median = 5
- Mean = 4.45
- Range = 3

20. Were you able to find the information you wanted from this feature?

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>36.4%</td>
<td>4</td>
</tr>
<tr>
<td>Most</td>
<td>54.5%</td>
<td>6</td>
</tr>
<tr>
<td>Some</td>
<td>9.1%</td>
<td>1</td>
</tr>
<tr>
<td>None</td>
<td>0.0%</td>
<td>0</td>
</tr>
</tbody>
</table>

**TOTAL:**
- Mode = Most
- Median = Most
- Range = 3

20a. What information could you not find that you required, if any?

1K: “list of consumers / contact details”

1M: “I have to use it more to see if there was anything missing”

1N: “not in the level of depth for a specialist”

1A: “too many navigation options on home screen - could be simplified by making the ‘material categories’ screen the home page?”

Material Information

21. Rate the ease of use for this feature on a scale of 1 to 5 (1 = Poor, 5 = Excellent)

<table>
<thead>
<tr>
<th>Rating</th>
<th>Percentage</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>9.1%</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>36.4%</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>54.5%</td>
<td>6</td>
</tr>
</tbody>
</table>
22. Please rate relevance / usefulness of feature to your work as a designer on a scale of 1 to 5 (1 = 'No Relevance / Use', 5 = 'Extremely Relevant / Useful')

<table>
<thead>
<tr>
<th>Rating</th>
<th>Percentage</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>9.1%</td>
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</tr>
<tr>
<td>4</td>
<td>45.5%</td>
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<td>5</td>
</tr>
</tbody>
</table>

TOTAL: Mode = 4 & 5  
Median = 4  
Mean = 4.36  
Range = 3

23. Were you able to find the information you wanted from this feature?

<table>
<thead>
<tr>
<th>Information Level</th>
<th>Percentage</th>
<th>Score</th>
</tr>
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<tr>
<td>Most</td>
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<tr>
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<td>9.1%</td>
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</tr>
<tr>
<td>None</td>
<td>0.0%</td>
<td>0</td>
</tr>
</tbody>
</table>

TOTAL: Mode = All & Most  
Median = Most  
Range = 3

23a. What information could you not find that you required, if any?

1L: "Could be linked with CES material selector?"

1M: "More info on the meaning of compulsory"

Case Studies

24. Rate the ease of use for this feature on a scale of 1 to 5 (1 = Poor, 5 = Excellent)

<table>
<thead>
<tr>
<th>Ease of Use</th>
<th>Percentage</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>27.3%</td>
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<tr>
<td>5</td>
<td>72.7%</td>
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</tr>
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</table>

TOTAL: Mode = 5  
Median = 5  
Mean = 4.73  
Range = 2

25. Please rate relevance / usefulness of feature to your work as a designer on a scale of 1 to 5 (1 = 'No Relevance / Use', 5 = 'Extremely Relevant / Useful')

<table>
<thead>
<tr>
<th>Relevance</th>
<th>Percentage</th>
<th>Score</th>
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<tr>
<td>3</td>
<td>27.3%</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>36.4%</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>27.3%</td>
<td>3</td>
</tr>
</tbody>
</table>
26. Were you able to find the information you wanted from this feature?

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>36.4%</td>
<td>4</td>
</tr>
<tr>
<td>Most</td>
<td>27.3%</td>
<td>3</td>
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<tr>
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<td>27.3%</td>
<td>3</td>
</tr>
<tr>
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<td>9.1%</td>
<td>1</td>
</tr>
</tbody>
</table>

TOTAL: Mode = All
Median = Most
Mean = 4.00
Range = 4

26a. What information could you not find that you required, if any?

1H:  "It should be more consumer orientated, so, walkers cri[s]ps increased sales by 20% as a result of consumers feeling better about the brand"

1K:  "Label the advantages and outcomes of the case study's clearly (monetary terms)"

1M:  "The process they went through would be useful"

1A:  "need facts and figures relating to costs/savings to enable designers to promote eco-labelling to company directors! designers will only be able to make use of this tool if allowed to by non-designing decision makers."

Forum & Ask an Expert

27. Rate the ease of use for this feature on a scale of 1 to 5 (1 = Poor, 5 = Excellent)

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>9.1%</td>
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</tr>
<tr>
<td>3</td>
<td>9.1%</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>54.5%</td>
<td>6</td>
</tr>
<tr>
<td>5</td>
<td>27.3%</td>
<td>3</td>
</tr>
</tbody>
</table>

TOTAL: Mode = 4
Median = 4
Mean = 4.00
Range = 4

28. Please rate relevance / usefulness of feature to your work as a designer on a scale of 1 to 5 (1 = 'No Relevance / Use', 5 = 'Extremely Relevant / Useful')

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>36.4%</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>27.3%</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>36.4%</td>
<td>4</td>
</tr>
</tbody>
</table>

TOTAL: Mode = 3 & 5
Median = 4
Mean = 4.00
Range = 3
29. Were you able to find the information you wanted from this feature?

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>36.4%</td>
<td>4</td>
</tr>
<tr>
<td>Most</td>
<td>18.2%</td>
<td>2</td>
</tr>
<tr>
<td>Some</td>
<td>45.5%</td>
<td>5</td>
</tr>
<tr>
<td>None</td>
<td>0.0%</td>
<td>0</td>
</tr>
</tbody>
</table>

TOTAL: Mode = Some  
Median = Most  
Range = 3

29a. What information could you not find that you required, if any?

1A: "time delay between posting and receiving the answer deters me from using this feature. would only be as a last resort."

OVERALL

Appearance

30. Please rate the overall appearance of the resource on a scale of 1 to 5 (1 = Very poor, 5 = Excellent)

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>18.2%</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>27.3%</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>45.5%</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>9.1%</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL: Mode = 4  
Median = 4  
Mean = 3.45  
Range = 4

30a. Are there any changes you would suggest be made to improve the overall appearance of the resource, if any?

1J: "Perhaps highlighting some of the key sections on the home page as there are quite a few options to start with."

1N: "more information on each page - drop down menus would help"

1A: "graphically, i think improvements need to be made to appeal to designers. it's a functional tool, but should look damn sexy too."

4A: "Needs a slicker appearance. Some 3D effects on the tabs would bring it up a bit. Different colours for each area"

1C: "Graphically it wasn't professional"
31. Please rate how clearly the information is presented on a scale of 1 to 5 (1 = Very poor, 5 = Excellent)

<table>
<thead>
<tr>
<th>Rating</th>
<th>Percentage</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9.1%</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>54.5%</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>36.4%</td>
<td>4</td>
</tr>
</tbody>
</table>

**TOTAL:**
- Mode = 4
- Median = 4
- Mean = 4.18
- Range = 4

31.a. Are there any changes you would suggest be made to improve how information is displayed in the resource, if any?

1L: "quite word heavy could be more consise / use more pictures to illustrate a point"

2B: "Just to make it easier for people to find the back button & home page button."

1A: "all information displayed very clearly and is very easy to follow/understand."

4A: "V. informative but long paragraphs. Maybe break them up more."

Layout & Navigation

32. Please rate the design and layout of the resource on a scale of 1 to 5 (1 = Very poor, 5 = excellent)

<table>
<thead>
<tr>
<th>Rating</th>
<th>Percentage</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>36.4%</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>63.6%</td>
<td>7</td>
</tr>
<tr>
<td>5</td>
<td>0.0%</td>
<td>0</td>
</tr>
</tbody>
</table>

**TOTAL:**
- Mode = 4
- Median = 4
- Mean = 3.63
- Range = 2

32.a. Are there any changes you would make to improve the design and layout of the resource, if any?

1K: "Perhaps highlighting some of the key sections on the home page as there are quite a few options to start with."

1M: "Make the back arrow and home button a bit clearer"

1A: "layout wise, i think some of the 'home' screens within each section could be simplified and removed in some cases. i've just read a book about "the paradox of choice" - scientifically proven that too many ways to navigate through this tool will actually deter some people from using it in the first place!"

4A: "Maybe emphasive the more important areas, such as 'Material Selector' and 'Product Selector'. Have background tab smaller"
33. Please rate the ease of navigation through the resource on a scale of 1 to 5 (1 = Very poor, 5 = excellent)

<table>
<thead>
<tr>
<th>4</th>
<th>63.6%</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>36.4%</td>
<td>4</td>
</tr>
</tbody>
</table>

TOTAL: Mode = 4
Median = 4
Mean = 4.36
Range = 2

33.a. Are there any changes you would make to improve how users navigate through the various features of the resource, if any?

1A: “layout wise, i think some of the 'home' screens within each section could be simplified and removed in some cases. i've just read a book about "the paradox of choice" - scientifically proven that too many ways to navigate through this tool will actually deter some people from using it in the first place!”

Resource & the Design Process

34. Which stage(s) of the design process do you think this resource would be beneficial to, if any?

<table>
<thead>
<tr>
<th>Stage</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creation of Design Brief</td>
<td>5</td>
</tr>
<tr>
<td>Responding to Design Brief</td>
<td>3</td>
</tr>
<tr>
<td>Writing Product Specification</td>
<td>6</td>
</tr>
<tr>
<td>Responding to Product Specification</td>
<td>6</td>
</tr>
<tr>
<td>Conceptual Design</td>
<td>4</td>
</tr>
<tr>
<td>Design Development</td>
<td>5</td>
</tr>
<tr>
<td>Materials Selection</td>
<td>9</td>
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<tr>
<td>Prototype Modelling and Testing</td>
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<tr>
<td>Manufacturing</td>
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<tr>
<td>Marketing</td>
<td>9</td>
</tr>
<tr>
<td>None of the above</td>
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</tr>
</tbody>
</table>

Mean = 4.09
Range = 9

Resource & You

35. If available, would you use this resource again when designing in the future?
### 35.a. If yes, which feature(s) do you think you would use again?

<table>
<thead>
<tr>
<th>Feature</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Background (to research project and resource)</td>
<td>1</td>
</tr>
<tr>
<td>Frequently Asked Questions</td>
<td>5</td>
</tr>
<tr>
<td>Label Selector</td>
<td>8</td>
</tr>
<tr>
<td>Label Information</td>
<td>6</td>
</tr>
<tr>
<td>Product Selector</td>
<td>7</td>
</tr>
<tr>
<td>Material Selector</td>
<td>6</td>
</tr>
<tr>
<td>Material Info</td>
<td>5</td>
</tr>
<tr>
<td>Case Studies</td>
<td>3</td>
</tr>
<tr>
<td>Forum &amp; 'Ask an Expert'</td>
<td>5</td>
</tr>
</tbody>
</table>

### 36. Would you visit the resource again in the future for personal research?

<table>
<thead>
<tr>
<th>Response</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>45.5%</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>54.5%</td>
<td>6</td>
</tr>
</tbody>
</table>

### Resource & other designers

#### 37. Would you recommend other designers to visit the resource during their professional design process?

<table>
<thead>
<tr>
<th>Response</th>
<th>Yes</th>
<th>No</th>
<th>Unsure</th>
</tr>
</thead>
<tbody>
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<tr>
<td></td>
<td>10</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

#### 37.a. If yes, which feature(s) would you strongly recommend, if any? **(OUT OF 10, NOT 11)**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Background (to research project and resource)</td>
<td>0</td>
</tr>
<tr>
<td>Frequently Asked Questions</td>
<td>2</td>
</tr>
<tr>
<td>Label Selector</td>
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<td>Label Information</td>
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<tr>
<td>Product Selector</td>
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<tr>
<td>Material Selector</td>
<td>5</td>
</tr>
<tr>
<td>Material Info</td>
<td>5</td>
</tr>
<tr>
<td>Case Studies</td>
<td>4</td>
</tr>
</tbody>
</table>
38. Would you recommend other designers to visit the resource for personal research?

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
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</tr>
<tr>
<td>Maybe</td>
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<td>5</td>
</tr>
<tr>
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</table>