

Lords Science and Technology Select Committee Sub-Committee I: Waste Reduction

Summary

1. This submission discusses the various needs and requirements of product-, commercial interior- and industrial design consultancies in developing their practice of eco-design.
2. The evidence focuses on the existing business practise of small UK design consultancies with regard to sustainability, and highlights current industry opinions about legislation, levels of eco-design implementation, and the barriers cited of why eco-design strategies are not currently integral to every-design design practise.
3. Designers learn from project work and evolving experience. Whilst there are numerous academic publications in the field of eco-design, these are invariably not accessed by designers, who adopt a 'hands on' practical approach in learning and skills development.
4. The research concluded that SME design consultancies feel they are small fry in ability to implement eco-design and waste-minimalisation strategies, due to their clients – often large organisations – enforcing time and cost restrictions on the small enterprises they outsource design work to.
5. Design consultancies often state that the only way to ensure that design for environment strategies are enforced is through more concise, practical legislation, that can integrated into the design process.
6. In the current UK design sectors, designers state they lack information – be it knowledge about environmentally-preferable materials, eco-design strategies or general business support initiatives.
7. The evidence concludes with a need for a higher level of *innovation* within the design industry. Rather than slowly making incremental changes in developing products and services that are marginally less environmentally-less damaging, designers need assistance in becoming better at innovation. The innovation of new products and service systems has the potential to change consumer behaviour and move more quickly towards a sustainable society.

Background

8. De Montfort University's Faculty of Art and Design is distinguished in producing industry-relevant design education. Engaging with the industry that the faculty feeds is fundamental to achieving this capability. A strong component of this collaboration is **dmu design** - a design consultancy based within the University that also works in supporting and developing the design and manufacturing industry within the East Midlands region.

9. Beginning with *Improving Business by Design* in 2003, **dmudesign** has been charged with enabling SMEs to develop their businesses through innovative product design by both Leicestershire Economic Partnership and the East Midlands Development Agency. The focus throughout all programmes has been identifying opportunities for innovation within the East Midlands' design and manufacturing sector.
10. Our most recent programme, *The Resource Efficient Design (RED) Initiative* assists businesses in minimising the negative environmental impact of their products as well as identifying opportunities for innovation that can have a significant impact on resource efficiency. The key focus of The RED Initiative is to demonstrate the opportunities that resource-efficient design can deliver for businesses.
11. The RED Initiative works with the commercial interior design and industrial design sectors. 93 percent of product and industrial design consultancies in the UK are SMEs, of which 82 percent have less than 10 employees. 98% of interior and exhibition design companies in the UK are SMEs of which 94% have less than 10 employees. Collectively, the UK's design consultancies have a large influence over the environmental impact of products in the UK and with 16% of SME design consultancies having overseas clients, this impact stretches worldwide.
12. The following evidence outlines the experiences of **dmudesign** programmes in relation to eco-design practice in SME design consultancies in the East Midlands.

Can better designed products offset the increase in consumption?

Yes

13. It is widely recognised amongst eco-design practitioners that over 80% of all product-related environmental impacts are determined during the design phase. In any given product this can include environmental damage in sourcing materials, emissions and waste in production and wasted energy in use, in addition to the environmental impacts of disposal.
14. Eco-design can assist in waste reduction through minimising the use of materials or selecting alternative materials, however, design has a pivotal and potentially more critical role to play in changing consumption patterns. In order to achieve a sustainable society it is critical that alternative lifestyle solutions are designed, developed and adopted.
15. The various levels of eco-design implementation can be broadly grouped into two levels: *development* and *innovation*. The development of existing products can lead to a reduction in their impact. The innovation of products and services has the potential to adapt consumer behaviour and move more quickly towards an environmental and social equilibrium.

How can better product design be used to effect a change in consumption patterns and behaviour?

16. The role of the designer differs from the engineer in the focus on human interface. 'Human-factors' is a core skill of the design discipline. The designer is therefore well placed to understand, interpret and influence the consumption patterns and lifestyles of consumers.



17. A simple example of an innovative environmentally-preferable solution is the *eco-kettle*. The designers recognised that the major environmental impact throughout the life-cycle of a kettle is the excessive energy use due to users over-filling the product. The solution: a kettle that boils the required amount of water and reserves the remaining water for subsequent uses. The Department of Environment, Food and Rural Affairs say that *"If everyone boiled only the water they needed instead of 'filling' the kettle every time, we could save enough electricity to run practically all the street lighting in the U.K."*¹
18. An example of 'forward thinking' by eco-innovators can be found in transportation. As opposed to the minimal reductions that can be made through reducing materials in production (such as the SMART car) or reducing the energy in use (for example the Toyota Prius), a significantly greater environmental benefit can be gained from vehicle sharing schemes. One such scheme is the UCR Intellishare project² where users select vehicles that suit their needs for each individual transportation requirement only when they are needed.

What role can better design play in minimising the creation of waste?

19. At a more superficial level designers can develop products with waste minimisation in mind. Where affecting consumption patterns is not possible, designers can use various strategies to minimise the creation of waste.
20. There are various strategies for waste reduction including:
 - i. *Design for disassembly*
 - ii. *Light weighting*
 - iii. *Design for durability*
 - iv. *Recyclability*
 - v. *Reusability*
 - vi. *Life cycle / Cradle to Cradle design*
21. The initial reaction to minimising waste is often to focus on the end of a product's life cycle; however, the major impacts of a product may be elsewhere.
22. In energy-using products the highest environmental impact is typically the use stage. In this case efforts should be focused on energy reduction in use. An interesting example of this is Procter and Gamble's latest campaign, initiated in conjunction with Forum for the Future, that encourages their washing product users to turn their washing machines from 40 to 30 degrees.

Eco-design practice within industrial and commercial interior design consultancies

23. The RED Initiative supports the concept that the most effective way to progress design towards sustainability is to focus on the opportunities for innovation. Unfortunately the present focus of most organisations is on incremental improvement and redesign of existing products. There was found to be limited understanding of the opportunities that eco-design can bring for both design consultants and their clients.

¹ <http://www.nigelsecostore.com/acatalog/eco-kettle.html>

² <http://world.honda.com/ICVS/about/intellishare/inte.html>

The Use of Materials:

Challenges facing designers in adopting eco-design in everyday design practice

Material selection

24. The experience of The RED Initiative is that the main eco-design strategy that designers focus on is materials selection. This is supported by their clients who, where eco-design issues are considered, are reported to focus their requests for consideration of material selection.
25. Material selection amongst designers is normally experience-based. The majority of products will be designed in relation to their predecessors or similar products.
26. Designers indicated that the main barrier to selection of environmentally-preferable materials is a perceived additional cost. This is combined with a lack of confidence in the quality and performance of eco-materials, as they are often perceived as inferior alternatives.

Materials availability

27. The RED Initiative has experienced limited application of alternative materials (such as biopolymers and smart materials) by SME designers due to the potential limited availability in sourcing such materials. However, designers often mention materials featuring a high recycled content when considering eco-design alternatives.
28. One area in which material scarcity is regularly considered is when selecting Forestry Stewardship Council (FSC)-approved wood based products. The labelling scheme is well-known and commercial interiors designers often specify FSC-approved woods.
29. In most cases however, the selection of environmentally-preferable materials based on material availability is limited, with the majority of enquiries based on the selection of materials that have the *appearance* of 'environmental friendliness'.

End of life impacts of raw materials

30. Information on the potential end-of-life routes for products is not well understood by designers. This reflects the disparate recycling systems that products may face both within the UK and abroad. Apart from re-use, opportunities for product disassembly or even recycling of many products are limited. This lack of coherent systems restricts the potential for development of products in relation to end of life strategies.
31. There is potential for the development of more sophisticated and consistent recycling systems as legislation such as Waste Electronic and Electrical Equipment regulations (WEEE) bring a larger quantity of materials together.

What impact does the development of new materials have on design?

32. The development of new materials has limited impact on "everyday design" due to the need for materials to be proved and costs and supply chain issues to be reduced and resolved.
33. With limited time and money for product development, designers indicate that they are rarely given the opportunity to experiment with alternative materials. Where

they do try alternative materials it is likely to be in conjunction with a manufacturer, who will be more knowledgeable about the behaviour of that material in production.

34. In general, designers are more interested in which of the *conventional*, readily available materials are the least damaging. Constraints of time and demands on producing workable outcomes with limited testing often prevent even this level of alternative materials selection.
35. Where designers are looking to select an alternative material, they often remark that they find it difficult to select alternatives due to the lack of information about environmental benefits. Designers want a "quick fix" solution due to limited time for a full study of the material options. Providing information that simplistically ranks materials can be misleading, as environmental superiority is often situation specific. Further understanding and time to consider the overall lifecycle impacts of materials is required.

Demand (business framework)

How central is sustainable design to business thinking?

36. Amongst SME design consultancies, their directors and their staff, there is a general desire to respond to environmental concerns in their business practice, and in the design and production of products. Unfortunately this desire is not met by a tangible/financial demand. Eco-design practice is limited, with most small organisations rarely including eco-design considerations.
37. Even (as is often the case) when SME design consultancies and manufacturers produce work for larger organisations, there is little to no legal requirement for eco-design considerations.
38. Currently, resource-efficient design is viewed as a specialist or retrospective discipline. Enterprises of all sizes tend to only actively apply strategies of eco-design when they perceive that there are benefits to be gained from *green marketing* resulting from the applied eco-design.
39. However, a perceived fear of being left behind other enterprises who may already be implementing approaches is starting to alert businesses to the need to take action. According to Paaru Chauhan-Pancholi from retail design consultancy Briggs Hillier Design LTD, SMEs can not afford to lose clients if they can not prove their knowledge about sustainability issues.
40. Where businesses genuinely do wish to implement sustainable design strategies into their everyday business practice, they are often ill-informed about the methodology of establishing such strategies and find it difficult to identify good starting points for eco-innovation.

What initiatives are in place to encourage this and are they meeting business needs?

41. There are number of national government-funded environmental support programmes made available to businesses, such as The Carbon Trust, Business Link and Envirowise, as well as a host of regional development agency-funded local organisations open to SMEs – for example *The RED Initiative*, *The BEST Network*, and *Carbon Action Yorkshire*.
42. When consulting with SME design groups about the value of both local government programmes and national environmental-support programmes in assisting businesses in improving their environmental performance, it was discovered that

SMEs found regional business-support units more accessible and effective in conveying practical advice. Design SMEs particularly found programmes such as The RED Initiative to be of high value, due to the programme offering services specifically focused on the design industry, allowing support tailored to the precise needs of the SME to be communicated to businesses³. However, most design SMEs still feel that more engagement is needed between businesses and environmental- and business support organisations.

43. It is the view of many SMEs that The Design Council is currently very London-centric and should be more proactive in disseminating information, training and research conclusions into the design industry. According to Associate Director Kate Shepard from retail design and branding agency Checkland Kindleysides,

"The Design Council should play a larger and more significant part in informing design businesses about legislation and incorporating sustainability into SMEs' every day practise".

44. The Design Council-run programme *Design of The Times* (DOTT) and Designing Demand is already attempting to fulfil this need, although here there is less of a focus on eco design. Instead the project appears to consider general sustainability and cultural innovation issues, rather than directly engaging with design groups to assist them in employing practical eco-design techniques.

Does the current policy, regulatory and legal framework support incentivise the development of better, more sustainable products and processes? How is the framework communicated to businesses and what is the level of awareness and understanding among businesses?

45. There are national organisations such as the Design Business Association (DBA) and The British Design Innovation (BDI) offering services to design businesses such as information on legislation, legal advice and training packages. However, research carried out by The Design Council concluded that *"architects are more than twice as likely as designers to be doing job-related training"* and *"the proportion of people engaged in job related training is far lower among designers than for all other similar occupational groups"*⁴. There is therefore a need to communicate with design consultancies and in-house designers the need and benefits of continual training and skills development of employees, and to create stronger links between design businesses and organisations offering training services.
46. Other creative industries such as architecture and engineering have governing bodies such as the Royal Institute of British Architects (RIBA) and the Institution of Mechanical Engineers (ImechE) that oversee and regulate practitioners. These bodies offer an accreditation service where the members become chartered or professionally qualified to work in the sector, and which is recognised by both the industry and their clients. In contrast, the governing body for the design industry is *The Design Council*; however, this is not seen by designers nor the larger organisations that they produce work for as being regulatory or having any real control in implementing legislation. Similarly, *The Chartered Society of Designers*, *Royal Society of Arts* and the *Institute of Engineering Designers* are less well recognised in the industry as RIBA, for example.

³ Paaru Chauhan-Pancholi from Briggs Hillier Design LTD stated she valued local, sector-specific business support programmes more highly over national, general environmental advice bureaux because the local programmes are accessible, and easy to develop good relationship with.

⁴ The Design Council, 2007. *Training and skills: The business of design*. <http://www.design-council.org.uk/en/About-Design/Research/The-Business-of-Design2/Training-and-skills/>

47. There is therefore a need for a more recognised regulatory body in the design industry, to ensure strategies such as eco-design are successfully implemented in businesses.
48. The *Design Skills Advisory Panel* document, *Higher Skills For Higher Value*, written by the *Sector Skills Council, Creative and Cultural Skills* and *The Design Council* highlights an urgent need for more continual professional development in the design industry with regard to sustainability in design. It proposes that this should be a priority for the National Design Academy proposal in its report; however, progress on this recommendation has yet to come into fruition.

Design industry needs

What are the gaps in knowledge and how are they being addressed?

49. There is a need to provide in-depth support in Resource Efficient Design throughout the design cycle, where actual environmentally-considered, commercial products are generated. In addition, resource efficient design must be mainstreamed into the various sectors of the design industry whilst providing a step change in skills and accelerated development of environmental products and services.
50. At present, design consultancies and manufacturers' in-house designers have little awareness of eco-design approaches. The current perception of most designers is that products and services can be designed from an environmental approach simply by using eco-preferable materials. There is very little understanding of what life-cycle design methodology entails, nor how to apply it.
51. SME Designers often state they have little time to research traditional academic sources on subjects such as eco-design strategies; instead they invariably prefer to adopt practical, "hands-on" approaches to design.
52. Designers learn from experience, and so often an effective way of learning new skills and applying new approaches to design is through establishing exploratory design projects that allow true innovation and creativity, and that are not bound by the needs and demands of a client. For example, Creative id*a LTD are in the process of generating a showcase sustainable Point of Sale stand, to develop their designers' understanding and capabilities in the field of eco-design and to demonstrate to their clients the opportunities of eco-innovation within a commercial environment.
53. With regard to environmentally-preferable materials for use within 3D design, designers for the most part know of few specific examples of such materials, and also have little understanding about what different factors make one material more environmentally-preferable than another. There is therefore a need for more communication between materials scientists, materials suppliers and designers, and collaboration on development "showcase" projects where new materials can be utilised.

Impact of legislation

54. Legislation such as *WEEE* and *Packaging (Essential Requirements) Regulations* rarely influence the design practice of designers in consultancies. The legislation is normally dealt with in a reactive way making it of limited use in influencing designers' mentalities to waste minimisation. An example of the types of barriers faced can be seen in the *WEEE* legislation. The *WEEE* will cause an inherent cost to manufacturers but this will generally be accepted as an unavoidable, additional cost. It does not encourage designers to find alternative materials or design solutions.

55. Soft requirements that are often included in regulations, such as "...packaging shall be manufactured that the packaging volume and weight be limited..."⁵ have limited effect on moving the industry.
56. In light of this difficulty, "The government wants the European Commission to reform the Packaging (Essential Requirements) Regulations, saying criteria such as 'consumer acceptance' make the laws difficult to enforce..."⁶
57. Some retail design consultancies are trying to establish take-back systems but these need to be joined-up with the retailers and should ideally be driven by their customers.

The need for legislation

58. There are requests from certain sectors to legislate against specific materials and practices. For example, the retail design industry, a highly competitive, high turnover, highly wasteful sector sees legislation as the necessary driving force for their industry to change its current practice.
59. However, The RED Initiative has seen that there are opportunities for the industry to develop towards more sustainable solutions, in a more productive and rewarding way.
60. For example, Sheridan and Co. – an established retail design consultancy – are producing a showcase, eco-design concept solution, to market the opportunities for resource efficient design. They are exploring alternative materials as well as innovation in the design. DIAM UK (part of a larger international organisation) has been trying to develop a system to return their display units for recycling and appropriate disposal.
61. When asking SMEs their opinions about the effectiveness of current and new legislation from an environmental improvement perspective, Paarü Chauhan-Pancholi from Briggs Hillier Design replied: -

"There is a need for more legislation to force design groups and their clients to apply eco-design strategies, as the issues and need for sustainability, plus the methods and technologies to deal with the problems are already in existence. However, the government needs to bear in mind the practicalities of implementing eco-design legislation in businesses, such as the cost implications, and availability and communications about eco-materials and systems in the supply chain".
62. Any new legislation should ensure that resource efficient design (eco-design) is a mainstream normal, accepted principle in every day design practice, not just a specialist or retrospective application.
63. Existing legislation is of limited value. Encouraging solutions to definable problems does not stimulate the creativity that designers can bring in providing innovative, radical solutions. For example, defining a requirement for materials reduction does not encourage the use of alternative materials. Demanding use of biodegradable materials, for example, may restrict the development of a more durable, re-usable solution.

⁵ Packaging Essential Requirement Legislation

⁶ Packaging News, 01 September 2007, <http://www.packagingnews.co.uk/news/736868/pack-minimisation-laws-reformed/>

- 64. Need to stimulate demand amongst consumers, demonstrate the opportunities to businesses, support SMEs, legislate where possible to abolish the worst and encourage development of eco-designed products.
- 65. Legislation needs to include systems considerations, for example, the requirements on designers to improve recyclability must be met by improved recycling systems. A momentum is needed in the demonstration of functional and saleable materials properties in order for them to be taken up by the design industry.

Conclusions

- 66. The ideal scenario is for eco-design to be incorporated as a natural part of the everyday design process. To designers, good design should mean that eco-design considerations are an integral factor.
- 67. Designers are not typically in control of what they design. Generally designers operate in very small businesses that sell skills to large corporations, who generally undervalue design.
- 68. The creative capability of the UK's design industry is not lacking, nor is its desire to reduce the environmental impact of product and retail design. As an industry dominated by small businesses, its ability to drive change in this area is limited as it relies heavily on clients for day to day turnover of business. Conversely, SME design consultancies have an invaluable capacity for innovation. Organisations that contract designers must recognise the value of design in order to produce design solutions that are exceptional in all aspects, including their environmental impact.
- 69. A level of momentum should be expected from the design industry as it must demonstrate the opportunities to clients. Some design consultancies are taking the lead and differentiating themselves. Some designers have remarked on the need for designers to be proactive in demonstrating the potential of eco-design.
- 70. *"Try to promote the advantages of eco design to our clients and focus their minds on the advantages it can bring to their business."*⁷
- 71. Design in the UK is at risk from the development of the cheaper overseas market⁸. Value added services are an opportunity for UK consultancies to maintain a cutting edge.

*"... Accepting that resource-efficient design or eco-design is becoming part of the design & manufacturing landscape, design consultancies have to be proactive & include it as part of their package of research, design & development services - not least because it is adding value to their own consultancy work as well as to that of their clients. Only a short-termist could argue otherwise."*⁹
- 72. There is a need to enable SMEs to keep abreast of environmental requirements and industry trends. Larger organisations have the time to invest in developing their

⁷ Anonymous. Retail and Point of Sale designer.

⁸ "Two thirds of...designers (64%) have seen the intensity of competition for UK work increase over the past three years and around the same proportion (67%) expect it to increase further in the next three years." In the UK, almost everyone faces competition from other UK designers for domestic projects (97%), but the 78% of designers reporting overseas competition for the same work say that it's from designers in Asia (56%) - in particular India (38%) and China (26%) - and Western Europe (30%).
<<http://www.designcouncil.org.uk/en/About-Design/Research/The-Business-of-Design2/Competition2>>

⁹ Nicki Theokritoff, UK furniture designer

knowledge and strategies in this area. However the overwhelming trend to outsource design means that these skills are not developed within the design function of the product development process. Environmental considerations in relation to products or environments tend to stay within company policy and corporate and social responsibility (CSR) reports, rather than being implemented as the design function.

73. It is important that the value of the SME design industry is recognised and supported in developing invaluable eco-design skills and knowledge.

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