



GREEN

is the colour

Pressure is mounting on designers to think about the environment and that pressure is being applied from two general directions.

From one side comes concern about global warming. By designing components and products that consume less power, the need to generate power is reduced and, hence, greenhouse gas emissions are cut.

The other main pressure comes from a need to stop waste electrical and electronic products going to landfill. Part of this solution is for products to be designed for recycling.

But just what is 'environmental design' and what issues does it raise? We asked a panel of experts. Taking part were Envirowise's cleaner design specialist Jenni Rosser, Luke Robbins, sustainable design specialist with Industrial Design Consultancy (IDC), Steve Chambers, head of Sagentia's science and technology division, and Mathew Palmer, business development manager, embedded technologies, from The Technology Partnership.

First up was Rosser. "Environmental design aims to minimise the costs and environmental impact of a product over its entire life cycle. Improving resource productivity – producing more electronic goods and services with fewer materials and input from utilities and with less pollution and waste – will create sustainable benefits for the environment, and ultimately reduce business costs."

In Chambers' view it is low energy usage

What approaches can be taken to improve environmental design? By Graham Pitcher.

of product, low production cost and energy, as well as reducing toxic compounds in the product and in the manufacturing process. "It's about choosing the right manufacturing location to reduce the carbon footprint by minimising transportation of components and final product. It's about designing for ease of recycling and future proofing, so the goods



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are robust, reliable and retained, rather than upgraded and replaced."

TTP's Palmer supported this view. "Initial design is only a part of the story and many other considerations will have to be taken into account in the future, such as whole life environmental effects, reuse and recycling issues, along with the elimination of potentially hazardous materials."

How important is it for designers to think environmentally? IDC's Robbins contended: "Many of the social and environmental impacts that arise from the products that people choose are already designed in long before they reach the end user. According to the Industrial Design Society of America 'as much as 75% of the environmental impacts (as well as the costs) that a product throws off throughout its lifetime is determined at the design stage'. Taking that on board, it is – and will be in the future – essential for electronic designers to consider environmental factors. However, it is not just the role of the electronics designer to think environmentally. It should be considered by the organisation as a whole to really make a difference."

Packaging design brings results

Rosser added: "It's very important. Packaging design can have an enormous impact on the environment and often results in cost savings that are quicker and easier to achieve than in products. Cleaner design in relation to products can help companies benefit both from compliance with legislation and the economic, environmental and marketing opportunities."

Having established that environmental design is important, what areas should designers concentrate on?

Chambers believed that eliminating unnecessary energy use was crucial. "The biggest impact would be to reduce or eliminate standby current usage in consumer goods. Typically, this consumes 20% of the energy used in operating mode, but achieves nothing."

In Robbins' opinion, a general starting point would be to consider the entire life cycle of the product. "A Life Cycle



Assessment provides an opportunity to prioritise which strategies will make the largest reductions in environmental impacts.

"Typically," he continued, "the manufacturing processes and the energy usage of electronic products are the major contributors to environmental impacts. For instance, there are around 12million home broadband users in the UK, many of whom use wireless routers and never switch them off. Assuming the average router consumes around 10W and that all were left on, this would collectively consume around 2880MWh per day and emit around 100,000 tonnes of CO2. Designing in simple environmental features, such as a sleep mode or shutdown timer, could reduce these amounts by up to 50%."

However, Rosser contended: "It may not always be essential for companies to go through a complete product Life cycle analysis. Simply asking the design and manufacturing staff what they think and coming up with a list of three areas to concentrate on during the redesign could have a massive impact on the product, both with regards to cost savings and environmental benefits."

She added: "There is also the potential to achieve real commercial benefits by identifying more sustainable techniques to



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minimise the use of materials over the entire life cycle – from design to disposal. Our experience has shown that this approach can often generate long term cost efficiencies, as well as opportunities to innovate."

Elegant designs needed

Palmer's view? "Elegant designs will use fewer components and, in addition to saving cost, will mean the lowest environmental impact of the initial design is achieved. Designers should also consider the possibilities of future upgradability to ensure the maximum life for their designs or simple disassembly to allow reuse or recycling."

What benefits, apart from the environmental ones, might accrue from more environmentally friendly design? Robbins noted: "Benefits include lower manufacturing costs, increased profits and increased competitiveness. More efficient electronic products can demand higher prices and bigger margins, whilst strengthened brands improve customer relations. And environmentally designed products will be more readily recycled, reducing the cost of complying with WEEE obligations and even allowing reuse or recovery of some elements."

Rosser concurred: "By considering the environment and adopting 'cleaner' design

techniques, there are opportunities for product designers and manufacturers to play a key role in helping the UK to meet future carbon targets and to reduce the emissions associated with inefficient consumer goods.

"Designers have a key role to play in helping companies to adopt best techniques, which could help save around £100million in manufacturing costs for example. They can also assist in gaining a competitive advantage from functionality and service innovation and will reap the benefits from environmental marketing and enhanced reputation."

Chambers believes the greatest environmental impact could be made by 'future proofing' – making products more durable and increasing their life span. "Unfortunately," he observed, "the rate of change and progress in improving performance has resulted in an accelerating trend to dispose of equipment way before the end of its functional life span in order to replace it with the latest development or update.

"However, future proofing will buck the market trend and limit business growth so is unlikely to be adopted."

Agreeing, Palmer concluded: "The throw away society approach will have to change if we are to make any real progress in reducing the environmental impact of electronics." ■



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HOW GREEN ARE YOUR PRODUCTS?

IDC has developed an online tool that helps designers and engineers access the knowledge to help make sustainable design decisions. Its LCA Calculator (www.lcacalculator.com) provides a free and quick way to assess the environmental impact of a product by calculating its energy inputs and carbon outputs from cradle to grave.

Other sources of input include Envirowise (www.envirowise.gov.uk) and the Centre for Sustainable Design (www.cfsd.org.uk).