

**Important information concerning
forthcoming Government legislation**

**DIRECTIVE ON WASTE ELECTRICAL AND
ELECTRONIC EQUIPMENT (WEEE)**

**DIRECTIVE ON THE RESTRICTION OF
USE OF CERTAIN HAZARDOUS
SUBSTANCES (ROHS)**

**A guide to the marketing,
product development
and manufacturing actions
you need to take**

dti

defra
Department for Environment
Food and Rural Affairs

Directive on Waste Electrical and Electronic Equipment (WEEE)

Directive on the Restriction of Use of Certain Hazardous Substances (ROHS)

This document explains the issues involved and why you need to act NOW. In the following pages you will find answers to questions on:

	Page
Who is affected?	1
What the legal compliance issues are	2
Implications for UK electrical and electronics companies	3
Implications for marketing	4
Manufacturing/environmental compliance considerations	7
Actions to take next	10

Sustainable design and product recovery

Overview

Two new items of European Union environmental legislation will be introduced into the UK from late 2004 onwards. They will contribute towards a better environment but will have significant implications for UK electrical and electronics companies in terms of marketing, design and manufacturing.

The Directives on Waste Electrical and Electronic Equipment (WEEE) and the Restriction of Use of Certain Hazardous Substances (ROHS) will require UK companies to recycle waste electrical/electronic equipment and remove certain hazardous substances.

The longer you delay action, the higher your costs will be. In fact, those that respond rapidly are most likely to derive significant competitive advantages. Those who ignore these warnings could be hard hit in a few years from now.

Failure to act promptly could mean:

- **Finding yourself out of step with, and at a disadvantage within, your marketplace**
- **Additional costs in meeting recycling and environmental compliance requirements**
- **If you are part of a supply chain, you risk losing both customers and suppliers if you fail to meet design and manufacturing requirements**
- **Your products being banned from sale if you fail to comply with ROHS**
- **You may lose the opportunity to influence the type of scheme that suits your business**
- **You being unprepared to pay your share of the recycling costs for historical waste in your sector**

Who is affected?

The WEEE Directive covers the design and production of electrical and electronic equipment to aid repair, possible upgrading, re-use, disassembly and recycling at end-of-life. The Directive covers a wide range of equipment falling into ten broad product categories with a voltage of up to 1,000 AC and 1,500 DC.

From August 2005, it makes producers of such equipment responsible for financing at least the collection of waste electrical and electronic equipment from central points, specialist treatment, and meeting the targets for re-use, recycling and recovery.

A producer is defined as any company which, irrespective of the selling technique used:

- **Manufactures and sells own brand electrical and electronic equipment**
- **Resells equipment produced by other suppliers under its own brand**
- **Imports or exports affected equipment into an EU Member State**

All UK manufacturers and suppliers in the market sectors below will be affected.

	IT, telecoms and consumer equipment	Electrical / electronic tools (large industrial tools are exempt)	Monitoring and control instruments*	Toys, leisure, sports and medical equipment*
Power supplies	●	●	●	●
Housings and electrical/mechanical attachments	●	●	●	●
Motors and drives	●	●	●*	●
Printed circuit boards	●	●	●	●
Electronic components	●	●	●	●
Displays	●	●	●	●
Switches, sockets, connectors and wiring	●	●	●	●

*Certain medical equipment systems and monitoring and control equipment are exempt from ROHS. Details of minimum end-of-life re-use, recycling and recovery targets are given in Appendix 1.

The aims of the legislation

The Directives aim to reduce the overall environmental impacts of electrical and electronic equipment by making producers more responsible for the downstream impacts of the products they design, manufacture and assemble.

This requires producers to adopt more:

- Sustainable design of products
- Life-cycle thinking
- End-of-life management of products

The Directives apply to all companies and there is no exemption for small firms. More detailed information on the Directives can be found at www.dti.gov.uk/sustainability

We are currently looking at over 30,000 components to see what supplier and manufacturing changes are needed.

Robert Turner
Principal Approvals Engineer
Pace Micro Technology

What is the legal compliance?

Auditing products, components and sub-assemblies to ensure no restricted substances are used

To comply with the ROHS Directive, from July 2006 you will need to demonstrate that your products do not contain more than the maximum permitted levels of:

- Lead
- Mercury
- Cadmium
- Hexavalent chromium
- Polybrominated biphenyls (PBBs)
- Polybrominated diphenyl ethers (PBDEs)

It is proposed that the levels are 0.01% by weight for cadmium in any individual homogenous material and 0.1% for the other substances.

Use of these substances in spare parts to repair equipment put on the market before July 2006 will be permitted, but will not be allowed in new equipment. The materials content of components and sub-assemblies will also affect how products can be recycled and recovered at end-of-life to meet WEEE Directive targets.

To show compliance, producers have to survey their component and sub-assembly suppliers. In turn, first tier suppliers require materials information from their suppliers, and so on down the supply chain.

Where restricted substances are currently in use, the greatest costs will arise from the need to develop, test and re-qualify products, components and sub-assemblies to meet performance specifications and standards. This will have a considerable impact on supplier contracts through the supply chain and will require extensive awareness communication. The earlier this is started, the less expensive and disruptive it will be.

Guaranteeing the future costs of WEEE for equipment sold in Europe

From August 2005, producers who wish to market electrical and electronic equipment in any EU Member State will have to guarantee that future costs for the collection of WEEE from central collection points and onward treatment and recycling costs will be met, even if the company ceases to trade. They can do this by a variety of routes which might include joining a scheme for financing WEEE, by taking out 'recycling insurance', or opening a bank account where the money deposited is only released to pay for managing WEEE. Leading insurance companies are currently developing appropriate schemes and setting prices for insurance premiums.

Financing collection of WEEE and meeting recycling/recovery targets

From August 2005, producers have to finance collection of household WEEE from central collection points (eg local authority recycling centres). Producers selling to commercial customers must provide for collection, treatment and recycling of old products on the sale of new products. For products placed on the market after 2005, business-to-business sales must be covered by appropriate contractual arrangements between parties for recovery and recycling.

Priority should be given to repair, upgrade and re-use of whole appliances for original purpose, for example, using a product leasing approach. Where this is not appropriate, producers must arrange for target levels of re-use, recycling and recovery of WEEE components, materials and substances to be met by December 2006 (Appendix 1). Producers can choose to meet their obligations either individually or by joining a collective scheme.

Financing of historical waste

All producers will have a shared responsibility for financing collection and treatment of waste put on the market before August 2005 (to be known as historical waste).

Each producer's part in this responsibility will be calculated on a proportionate basis such as according to market share at the time that the equipment becomes waste.

The Directive allows producers the option to show consumers the costs of collecting and treating historical waste on the sale of new products for up to 8 - 10 years after August 2005.

Member States may provide the option for producers to use a 'visible fee' to show these costs.

The exact method of financing historical waste has yet to be decided. Options for this will be included in the next Government consultation late in 2003.

For products put on the market after August 2005, producers will be required to guarantee that future costs of WEEE will be met.

Product marking and disassembly information

From August 2005, each producer must mark its name on the product together with a symbol (a crossed-out wheelie bin) to show that it must not be disposed of in municipal waste collection.

Producers will have to provide information to enable treatment facilities, re-use centres and recycling facilities to disassemble, re-use and recycle their products. Producers also have to provide information to enable treatment facilities to identify specific components and materials which must be removed from equipment for separate treatment at end-of-life, including:

- Capacitors with polychlorinated biphenyls
- Components with mercury (such as switches, backlighting lamps etc, which will be banned after July 2006)
- Batteries
- Printed circuit boards used in mobile phones and those greater than 10 cm²
- Plastic containing brominated flame retardants (to be banned after July 2006)
- Cathode ray tubes (fluorescent coating must be removed)
- Gas discharge lamps (mercury must be removed)
- Liquid crystal displays

Implications for UK electrical and electronics companies

The total estimated cost to UK companies producing electrical/electronic products, components and sub-assemblies is estimated as:

- **£120 million per annum annualised over 10 years for capital costs and research and development costs to comply with ROHS**
- **£55-£96 million per annum increased operating costs from using alternative substances to comply with ROHS post 2006**
- **£217-£455 million per annum to comply with the WEEE Directive**

Need to increase prices

These costs will force companies on marginal profit levels to consider price rises.

Some manufacturers and suppliers may be able to absorb some of these costs. However, failure to act soon may mean larger increases than are necessary.

Estimated UK producers' annual costs of compliance with the WEEE Directive*	
Separate collection of WEEE	£26-£98 million
Dismantling and treatment of WEEE	£98-£207 million
Meeting re-use, recycling and recovery targets	£52-£114 million
Marking products for separate collection	£18 million
Providing information to treatment and recycling facilities	£7 million
Reporting compliance information to Environment Agency	£11 million
Total	£217-£455 million

*Based on data in DTI Partial Regulatory Impact Assessment of the WEEE Directive, March 2003. Overall costs will depend on how much WEEE is collected.

Marketing implications

Marketers and sales managers will know the importance of maintaining market segment positioning and being familiar with customer expectations. Having insufficient time to assess market implications of product and design changes or to respond to new products and price initiatives by other manufacturers, could pose serious problems for marketing planning and sales profitability. That's why you need to act now.

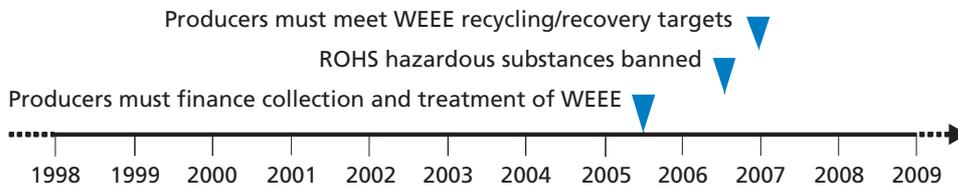
Furthermore, having unnecessary price implications forced on you as a result of late and rushed design and manufacturing changes, without having sufficient time to prepare customers for them, could further exacerbate the problem.

Such difficult marketing scenarios are highly likely if other parts of your organisation, such as design, fail to act in time.

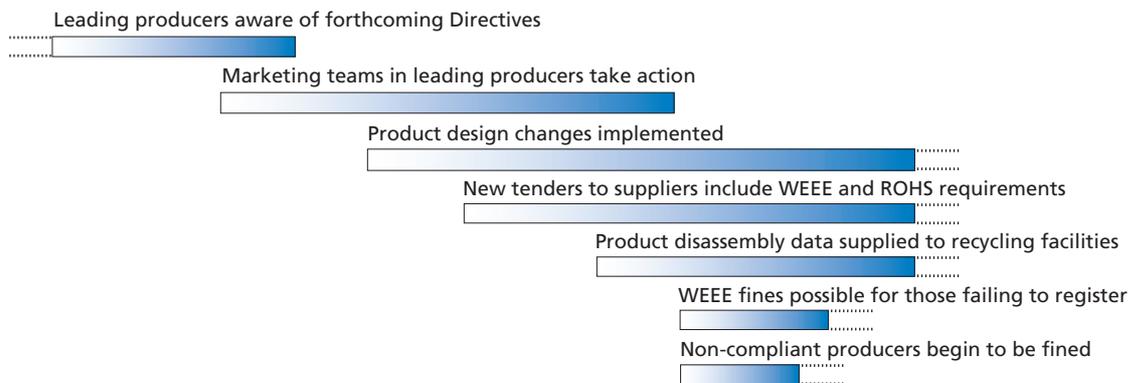
Many of your competitors may have started to determine their market response as long as three years ago, with new product designs now starting to come into production. This is particularly true of the market leaders, whose marketing actions may soon start to impact on, or influence, your own customer base.

By the time the proposals for these Directives were adopted by the European Commission in June 2000, the marketing teams in many large leading electrical and electronics companies had already taken action.

WEEE and ROHS compliance requirements



Typical market implications



Fujitsu Services sells high-value IT systems which retain some end-of-life value. We have operated a business-to-business take-back service for several years, getting value back from components and recycled materials. This asset management approach strengthens our customer relationships and encourages them to upgrade to new products, which enables Fujitsu to control the size and quality of the market for refurbished equipment.

Joy Boyce
Head of Corporate Environmental Affairs
Fujitsu Services

By 2008, between 60% and 80% of Hewlett Packard global sales will be in countries with take-back legislation. We recognise the need to take action now rather than wait for the legislation to be enacted.

Kirstie McIntyre, WEEE Program Manager
Hewlett Packard

NEED FOR ACTION

If you have not already started to respond to these Directives, you need to take action as soon as possible, otherwise your cost of compliance will increase.

WEEE scheme selection

Some key marketing considerations revolve around the decisions to be taken on the option, whether an individual approach or through a collective scheme, that is best to help you meet your obligations under the Directive.

A survey by ICER (Industry Council for Electronic Equipment Recycling) found that IT, telecoms and consumer equipment producers preferred the individual approach, white goods firms favoured a collective system, whilst small household appliances and tools manufacturers were undecided.

Product lifetime is an important consideration. Producers with long product lifetimes are more likely to prefer a collective approach.

On the other hand, value retention at end-of-life and the market for refurbished equipment are business reasons why companies in high-value, shorter lifetime products strongly favour an individual approach.

In many leading companies, not only have product design changes already been introduced, but the information has been passed on to recycling facilities to help them assess the disassembly of products for recycling and recovery at end-of-life.

In some cases, this will result in manufacturers entering new joint ventures in supply-chain recycling, as well as opportunities for secondary market sales.



Take-back scheme for mobile phones

Telecoms and electronics recycler, Shields Environmental, has introduced a scheme to tackle the 15 million mobile phones being scrapped each year in the UK as users upgrade to new models. UK network service providers and several leading retailers will now encourage customers to return old phones through a 'Foneback' programme, using freepost envelopes or in-store collection.

As returned phones are processed, Shields Environmental will track and record the details and provide reports to help organisations track their phones and comply with the WEEE Directive.

Assessing the customers' end-of-life decisions

The starting point for reducing end-of-life costs is to understand what causes the user to discard the product and what then happens to it. This will help you to identify the best end-of-life options in a marketing context and this will influence the design changes needed.

A simple, robust approach which is easily adaptable to changes in future market conditions is likely to be best.

Choosing the best end-of-life option

Options that avoid the product becoming waste in the first place will generate the greatest economic and environmental benefits. In a marketing context, the following options offer the greatest benefits.

- **Durable products that extend product lifetime**
- **Re-use of whole products, for example, by resale to secondary markets**
- **Upgrading, for example, to update the product with the latest technology**

Collaboration with customers

Collaboration between suppliers, producers, customers and recyclers is needed to ensure successful end-of-life options. In recent years, some large OEMs have pressured suppliers to share product warranty costs. Most OEMs now expect a two-year components and sub-assembly warranty to start when the customer puts them into products, not when sold. Some OEMs also ask suppliers to take back components and sub-assemblies at end-of-life as part of the price, and to arrange for them to be re-used, recycled or recovered.

Advice builds customer relationships

CHK makes bespoke sub-assemblies with a high technical and test input. Realising that one large customer appeared unaware of the WEEE and ROHS Directives, CHK saw it as an opportunity to strengthen its relationship with them and was invited to discuss the implications with the European Engineering Director. CHK is now helping the customer to redesign the sub-assembly to reduce the costs of compliance.

Environmental marketing

Sustainable product design can help companies increase market share by tapping into the growing number of 'green' consumers.

Public sector customers also now expect suppliers to address sustainable product design when tendering for contracts. From January 2003, NHS purchasing and supply specifications require suppliers of electrical and electronic equipment to demonstrate how they will manage their products at end-of-life to facilitate recycling and recovery.

Larger commercial customers have also indicated that they want producers to demonstrate adequate control over future end-of-life product costs.

In consumer electronics, some companies have gained increased market share and profitability by advertising the lower running costs of their products.

Meanwhile, the Japanese electronics industry is using sustainable product design and end-of-life recycling legislation to reduce the industry cost base and develop competitive positioning in export markets. This has been triggered by new Japanese environmental legislation that came into effect in 2001.

Electrolux environmental marketing strategies

In November 1999, Electrolux and the electricity supplier Vattenfall set up a limited trial scheme in Gotland, Sweden. Customers could buy a 'clean clothes' service without having to own a washing machine. Customers 'borrowed' a washing machine free-of-charge from Electrolux, which was connected via an 'intelligent' electricity meter and the internet to a central database that read the meter and tracked the machine's use. In the trial, customers paid 72p per wash cycle. The charge was made through their electricity bill. With such a service, at end-of-life the machine would be taken back for remanufacturing or used for spare parts by Electrolux. Electrolux is now evaluating the project.

Another Electrolux marketing strategy for energy- and water-efficient appliances was launched in 1994. By reducing consumer running costs, Electrolux can sell its 'Green Range' products at a higher price. In 2002, the Green Range accounted for 16% of European sales, with a 22% gross profit - better than average margins. Green Range products have also delivered an above average increase in market share compared to other Electrolux products.

Many OEM producers, particularly in consumer supply chains, have published environmental policy commitments. To comply with these, they are now putting pressure on their supply chains by:

- Dealing only with suppliers that have a certified environmental management system, such as ISO14001 or EMAS
- Asking their suppliers to demonstrate that they manufacture their products, components or materials in an environmentally responsible manner

Some suppliers have turned this pressure to their advantage.

The biggest threat in the ROHS Directive is identifying where banned materials are used. Industry is focused on eliminating leaded solder, but many other components could contain lead, such as pigments, plasticizers or impurities in metals.

Not knowing what is in individual components may mean that some products have to be taken off the market by July 2006. Sony is now asking suppliers if their parts have any of the banned materials.

Peter Evans, Environment Manager
Sony UK

MARKETING CHOICE

Many companies are using the legislation as an opportunity to improve their marketing position and customer relationships. You can too.

Manufacturing/environmental compliance considerations

An Envirowise study found that adoption of sustainable product design best practice could help UK electronics companies save £205 million per year - £116 million from reduced manufacturing costs and £89 million from reduced end-of-life costs.

The market leaders have already taken action to redesign their products and, in some cases, have set up end-of-life product management systems that cover the costs of compliance and show a net profit.

Design tip: send new product samples to recyclers

Some manufacturers are gaining valuable end-of-life design advice by sending new product samples to recycling facilities.

The recyclers assess the ease of product disassembly and the cost benefits of recycling its materials. This information is fed back to product designers to help them decide on materials and assembly options.

Compliance with the ROHS Directive will incur additional costs for UK manufacturers of electronic products, components and sub-assemblies in the order of:

- **Research and development costs to develop, test and requalify products, components and sub-assemblies using alternative substances and the capital costs of retooling lead-use equipment (ie the substitution or refurbishment of solder bath machines and surface mount ovens) - estimated as £120 million per annum annualised over 10 years**
- **Higher annual operating costs due to the increased cost of alternative substances, use of greater quantities, increased energy consumption (particularly for alternatives to lead solder) and lower process efficiencies - estimated at £55-£96 million per annum.**



Planning ahead

Minimising the costs of compliance with these Directives will require companies to make significant changes to the design of their products at the earliest opportunity. Design decisions made at the start of the product design process have a knock-on effect throughout the design process.

The cost of implementing these design changes can be reduced by planning ahead and making key design decisions as early as possible. This also allows maximum opportunity to consult with customers and suppliers on proposed changes, and to take on board their requirements and suggestions.



Savings and opportunities

Many options and savings exist in responding to the WEEE and ROHS Directives, such as:

- **Refurbishment or remanufacture, employing new components and sub-assemblies to replace failed items**
- **Disassembly to recover components and sub-assemblies for re-use using similar design techniques for servicing and maintenance**
- **Recovery of materials for recycling, by incorporating easy break-away sections for disassembly**
- **Recovery of materials for energy recovery in a power plant**
- **Saving on disposal to landfill**

Collaboration with recycler generates net cost savings for producer

As part of its plan to upgrade 35,000 payment terminals throughout the UK, Barclaycard requires its supplier, Ingenico Fortronic in Dunfermline, to collect the old payment terminals and arrange for re-use and recycling of components.

Old payment terminals are sent to CCL, a specialist electronics recycling facility in Irvine. Here, the sub-assemblies and components are removed, and the information is logged on a database which calculates the money that will be generated from re-use and recycling.

This sum, less the costs of disassembly, is paid to Ingenico Fortronic.

Optimising end-of-life product design

Having identified the most appropriate end-of-life option, you can consider making product design changes to gain the greatest cost savings. Examples of design considerations applicable to different end-of-life options are highlighted in the table below.

You can find more detailed information in Good Practice Guide (GG427) *Sustainable design of electrical and electronic products to control costs and comply with legislation*, which is available free through the Environment and Energy Helpline on 0800 585794.

Examples of design considerations for different end-of-life options	
End-of-life option	Example of design consideration
Re-use of whole products, for example, by resale to secondary markets.	Easy to change logo identity. Easy to refurbish exterior.
Updating products with the latest technology.	Modularisation by function.
Refurbishment by replacing failed components and sub-assemblies.	Embedded sensors and spare memory in controllers used to store product lifetime data for fault diagnosis.
Extraction of components and sub-assemblies for re-use.	Modules and sub-assemblies designed to be independently testable.
Extraction of materials for recycling.	Sub-assemblies easy to separate by material type. Minimise number of materials in production.
Materials extraction for energy recovery in a power plant.	Easily separated, high calorific value sub-assemblies.
Disposal to landfill.	Hazardous materials easily separated for disposal as hazardous waste.

Sustainable product design in Japanese electronics companies

Legislation on sustainable design and end-of-life recycling was implemented in Japan in 2000. Already, Japanese electronics companies are ahead of the rest of the world in sustainable product design, and the international nature of the industry means that sustainable design and recycling criteria will affect specification and procurement criteria worldwide.

The new laws are already starting to affect UK companies supplying and designing products for the European plants of Japanese manufacturers. Some 46% of Japan's research and development investment in Europe is in the UK.

Cost savings from recycling PCBs

A study by Envirowise in 2002 found that 6,600 tonnes of UK manufactured printed circuit boards (PCBs) from high value products, such as telecoms, computers, and other equipment, are discarded each year at their end-of-life.

Based on current recycling technology and materials prices, these PCBs are worth £2 per kg to recycle - equivalent to £13 million per annum. Re-use of high-grade components could net more than £60 per kg, equivalent to an additional £76 million per annum.

Improved PCB design

The study estimated annual manufacturing costs of PCBs fabricated and assembled in the UK at about £2.3 billion. By consulting fabricators and assemblers earlier in the design process, designers can considerably reduce these costs.

Recent surveys have found that 25% of all jobs received by PCB fabricators have critical errors resulting from design rule infringements. Adopting best practice design could reduce fabrication and assembly costs by at least 5%, equivalent nationally to £116 million per annum.

Reducing cost and improving functionality

Varian Medical Systems opted for sustainable redesign of its radiotherapy simulator collimator unit and is now achieving:

- £162,000 a year in components and materials cost savings
- A 65% reduction in the number of components used per collimator
- A reduction of 29% in the number of fasteners and a 27% reduction in assembly time
- Easier equipment disassembly for recovery and recycling

Reducing manufacturing costs

The Design Council agrees that at least 80% of the quantities and costs of materials and utilities required to manufacture electronic products are locked in at the design stage. Sustainable product design techniques can assist companies to redesign their products so that smaller quantities are used in the manufacturing process, therefore generating significant cost savings.

The sustainable product design approach has proved to be a real eye-opener, taking away preconceptions and resulting in products with significant cost savings and better functionality.

**John Peel, Managing Director
Varian Medical Systems UK**



Function and service innovation

Sustainable product design approaches can stimulate innovation and lead to radical and profitable changes in products.

Focusing on the actual service that customers gain from a product and understanding exactly how they use the product functions, can provide a new insight into different ways of delivering these functions.

If customers only want to use the service provided by the product, then leasing is best. The on-going income stream provided by selling services can be valuable to a company compared to the occasional sale of goods.

For example, a phone company can sell you a one-off product - say, an answer machine - or it can sell you a voicemail service that generates a monthly revenue stream.

Functional market leadership

Reviewing how customers use a product's function can identify new opportunities and ways to design products so that they gain functional leadership in the marketplace. For example, a multi-function product such as a combined printer, scanner and copier machine can increase market share by meeting customer requirements in a much more cost-effective manner. Such a combined device:

- Uses fewer materials and is cheaper to manufacture than three separate machines
- Uses 70% less energy in stand-by mode
- Takes up less space (a benefit to both the seller and the buyer)
- Costs less to transport and retail

Obviously, products like this need to be more robust to provide greater reliability, because if they do break down the user loses all three functions. However, manufacturers can also offer rapid replacement contracts which generate extra income and offer peace of mind for users.

Actions to take next

All UK electrical and electronics companies, if they haven't already done so, should take urgent action now. This will require you to determine information from different parts of the company, in particular:

- **Marketing** - in order to understand how the customer currently uses and discards products
- **Sales staff** - to calculate the annual weight of products sold
- **Technical staff** - to assess how the product, components and sub-assemblies could be re-used, recycled and recovered at the end-of-life

It is also important to consider whether or not:

- **The product is suited to a particular end-of-life option, for example, if the commercial value is in the packaged technology it contains, then product re-use, upgrading or refurbishment may be better end-of-life options**
- **The end-of-life option makes good business sense and can be integrated into the overall product marketing strategy**
- **Suitable collection, transport and storage arrangements exist or can be put in place for getting equipment back in sufficient quantities and condition to meet the selected end-of-life option**



Commitment and strategy

Visible top management commitment is vital in progressing these actions. This is because sustainable product design requires input and support from several different parts of the company in order to:

- **Gather information and ideas**
- **Allocate resources, including dedicated staff time**
- **Agree any design changes that may seriously impact on a wide range of business activities**

To convince senior management to take action, it is essential to make an effective business case. This should highlight:

- **Threats to the business from increased costs and competition**
- **The need to take action early to reduce these costs**
- **An overview of WEEE and ROHS requirements in your company**
- **Business opportunities which will gain you a competitive advantage**



Sustainable product design should be considered at the start of the design process. Time invested at the concept stage will pay dividends and avoid expensive design changes later.

It is generally a good idea to run a pilot project. This will give you the opportunity to develop and test process changes before full implementation across the company.

Teams and champions

It is essential to set up and resource an appropriate multi-functional team. Sustainable product design, and hence the team, should cover all relevant aspects within the business.

Ideally this integrated team should be led by a 'champion' or co-ordinator, an integrated approach sometimes referred to as 'concurrent engineering'. The team should have a very clear customer focus, plus strong links with suppliers and recyclers.

The team should be drawn from:

- **Design**
- **Purchasing**
- **Manufacturing**
- **Distribution**
- **Marketing**
- **Quality**
- **Health and safety**

Preparations at BT

BT spent a year educating its engineers, buyers and suppliers about WEEE and ROHS and building a database of hazardous substances used in over 20,000 products. It is agreeing phase-out dates with its major suppliers for the substances and selected alternative technologies.

In November 2002, BT introduced a pre-tender process which required all potential suppliers of products, sub-assemblies and components to provide information on:

- How they will demonstrate compliance with the WEEE and ROHS Directives
- Timetable for phase-out of restricted substances
- What take-back schemes the supplier will operate for end-of-life products, sub-assemblies and components collected by BT
- What re-use, recycling and recovery rates the supplier will achieve for products, sub-assemblies and components to ensure that BT meets its WEEE obligations

Education, training and tools

Your team should be encouraged to keep up-to-date with the latest developments in their fields. For some, this may already be part of their continuing professional development. Electronics designers, for example, should keep up-to-date with design for manufacture (DFM) checking systems for CAD (further information at www.edrcentre.org.uk).

Key staff should also be given training on sustainable product design issues, approaches and tools.

Where in-house expertise/resources are lacking, it will be worth obtaining help from consultants and other experts.

In some cases, help can be obtained from Envirowise (0800 585794) or local Business Links (0845 6009006 for further details).

You also need to raise awareness of product design issues with your key suppliers, for as well as advising on design for manufacture, they may help you to identify other new opportunities for sustainable product design.

Some suppliers might also take back their products and sub-assemblies for re-use or recycling at end-of-life.

A number of case studies are available free through the Environment and Energy Helpline on 0800 585794.

Raising supplier awareness at Varian Medical Systems UK

In conjunction with its local Business Link, Varian Medical Systems UK organised several one-day training courses for its major suppliers to:

- Introduce them to the concepts and tools for sustainable product design
- Involve them directly in sustainable design projects

Discussions with suppliers about sustainable design also provided an opportunity for Varian to develop closer relationships with those showing a proactive response.

Where can I get further information?

Information on both the WEEE and ROHS Directives is available at:

www.dti.gov.uk/sustainability

Further assistance can also be obtained via the Environment and Energy Helpline on **0800 585794**. The following documents are also available free of charge through the Helpline:

Cleaner product design: an introduction for industry (ref GG294)

Cleaner product design: examples from industry (ref GG295)

Cleaner product design: a practical approach (ref GG296)

Cleaner technology: an essential guide for industry (ref GG288)

Appendix 1

Minimum end-of-life re-use, recycling and recovery targets set by the WEEE Directive		
Product category*	Component, material and substance re-use/recycling by average appliance weight	Rate of recovery** by average appliance weight
Large household appliances (eg fridges, washing machines, electric ovens)	75%	80%
Small household appliances (eg vacuum cleaners, toasters, irons, clocks, scales)	50%	70%
IT and telecommunication equipment (eg computers, photocopiers, telephones)	65%	75%
Consumer equipment (eg televisions, video recorders, Hi-fi equipment)	65%	75%
Lighting equipment (eg fluorescent lamps, discharge lamps)	80%	N/A
Electrical and electronic tools (eg drills, sewing machines, lawnmowers)	50%	70%
Toys, leisure and sports equipment (eg video games and consoles, train sets)	50%	70%
Medical equipment systems (eg radiotherapy equipment, pulmonary ventilators)	No target has been set	No target has been set
Monitoring and control equipment (eg thermostats, control panels)	50%	70%
Automatic dispensers (eg drinks machines)	75%	80%

* See the WEEE Directive at www.dti.gov.uk/sustainability for further details.

** Includes energy recovery in a power plant, in addition to re-use and recycling.

For the purposes of calculating these targets, producers or third parties acting on their behalf will have to keep records on the weight of all WEEE entering treatment facilities and the weight of:

- Whole appliances which are re-used for their original purpose (this does not count towards meeting re-use, recycling and recovery targets)
- Components, sub-assemblies and consumables re-used for their original purpose or recycled
- WEEE where energy is recovered in a power plant
- Remaining WEEE which is disposed of to landfill

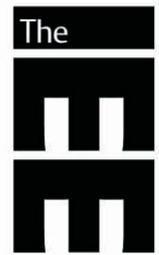
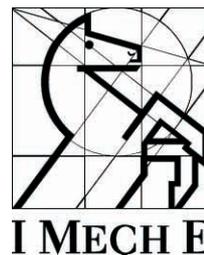
Calculator to help companies assess compliance with WEEE target levels		
Weight of WEEE collected	Akg
Weight of whole appliances re-used for original purpose	Bkg
Weight of components, sub-assemblies and consumables which are re-used for their original purpose or recycled	Ckg
Target level of WEEE re-use and recycling	$\frac{C}{A - B}$%
Weight of WEEE where energy is recovered in a power plant	Dkg
Target level of WEEE recovery	$\frac{D + C}{A - B}$%

Produced by Envirowise in support of DTI and DEFRA initiatives on WEEE and ROHS

Endorsed by Intellect

intellect

In consultation with the Institution of Mechanical Engineers (IMechE) and the Institution of Electrical Engineers (IEE)



Harwell International Business Centre | Didcot | Oxfordshire | OX11 0QJ
E-mail: helpline@envirowise.gov.uk Internet: www.envirowise.gov.uk

Envirowise - Practical Environmental Advice for Business - is a Government programme managed by Momenta, an operating division of AEA Technology plc, and Technology Transfer and Innovation Ltd.



GG416 © Crown copyright. First printed October 2003. Printed on paper containing a minimum of 75% post-consumer waste. This material may be freely reproduced in its original form except for sale or advertising purposes.

*For further information
please contact the*

**Environment
and Energy
Helpline**

0800 585794