

# PREPARE TO MEET YOUR MAKER!

## Coping with WEEE – End-of-Life Legislation

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### WEEE - A MANUFACTURERS NIGHTMARE?

Environmental legislation is soon to have more teeth in Europe, in what is seen by some as a continuing burden on hard-pressed manufacturers. The new Waste in Electrical and Electronic Equipment Directive (WEEE) is currently being passed into legislation in the European parliament.

Commonly known as Take-Back, which concerns the infrastructure for returning product, it follows on from environmental legislation on design of product, packaging, hazardous waste and is similar in concept to the Directive on End-of-Life (EoL) for vehicle returns.

Without doubt the message is clear for manufacturers, you make it or distribute it, then you are responsible for its disposal. The principle being, producer pays!

The WEEE aims to make producers pay for End-of-Life treatment and disposal costs of all products they put on the market; with the longer term objective being to avoid ultimate disposal to landfill and find alternative uses. That responsibility includes costs associated with the collection of consumer products and the management infrastructure of its ultimate disposal. It is designed so that the cost to a consumer is free (albeit imbedded in the retail price or service charge), but that the means and responsibility for enabling the process rest with the producer. It is part of a broader legislative framework as summarised in Figure 1.

Figure 1

#### EU Electronic Waste Legislation

**A series of multi-level proposals have evolved over several years and now comprises three key components:**

- The WEEE (**Waste from Electrical and Electronic Equipment**) Directive *requires end of life equipment to be collected for recovery, recycling and reuse.* Adopted by the commission on the 13/6/00 and has begun parliamentary process. Expected to become law in 2003.
- **Directive on the restriction of the use of certain hazardous substances** in electrical and electronic equipment, *requires that certain substances be phased out of use in equipment by 2008.* Originally part of WEEE but now considered as a separate Directive. Adopted by the commission on the 13/6/00; has begun parliamentary process. Expected to become law in 2003.
- Proposed **Directive on Electrical and Electronic Equipment.** In early stages of development by the DG Enterprise to *minimise the impact of products over their complete life cycle, from design through production, use and EoL.*

The impact is to broaden a manufacturer's supply chain, from cradle to grave, from conception in design to ensuring low impact on disposal, right back to the raw material utilised in production. On first reading it's enough to make any CEO shudder, but despite fierce opposition from industry the legislation will be in place on the statute books by 2002, not only that, but its scope is being continuously expanded, covering more products and tougher recycling targets.

However, with a bit of lateral thinking, we believe the legislation can offer significant revenue opportunities for manufacturers and service organisations (see *Profiting from Take-Back Legislation, Control, Vol. 27. No. 1 0 01/02, pp 19-21* ). Indeed, some manufacturers are quietly restructuring operations to capture future potential revenue. But how do you assess all the issues, and just what are the obligations and what is the legal force?

### THE GLOBAL PRESSURE FOR CHANGE

It's important to see why, almost suddenly, environmental pressure has resulted in legislation within Europe, whereas in other countries such as the USA, commercial pressures have dictated the approach taken.

Combined commercial and legislative pressure has placed an environmental requirement upon all manufacturers to ensure they manage and dispose of products they make in an environmentally safe manner. Some manufacturers are responding well and beginning to embrace the change, with products now being designed for easy dismantling and disposal. From the design concept to recycling and safe disposal, End-of-Life is now a reality. Take-Back, is coming.

Producers will have a mandatory requirement to manage and pay for the complete End-of-Life cycle for all products they have produced or distributed on a retrospective basis. Not only this but complimentary legislation in the areas of Consumer Warranty and Product Liability, will change the pattern of service concepts and service cost structures across Europe.

### THE WEEE LEGISLATION

Whereas the US places commercial pressure for environmental disposal, Europe has taken a different line, with pressure for legislation being most significant. With over 6 million tonnes of electronic waste produced in the EU each year, the problem is growing at an alarming rate, increasing at a growth rate of approximately 5% per annum, effectively doubling by 2010. In the UK, some 2m television sets and 12m mobile phones are discarded each year.

The Directive on Waste from Electrical and Electronic Equipment (WEEE) requires the setting up of Take-Back structures by manufacturers or distributors for the reduction and prevention of electronic waste the bulk of this waste being currently disposed in landfill. ([http://europa.eu.int/comm/environment/docum/00347\\_en.htm](http://europa.eu.int/comm/environment/docum/00347_en.htm))

Producers will be responsible for collection, treatment, recovery and environmentally sound disposal of their products either in or outside of the EU. In addition they will also be responsible for the financial implications of those requirements. The focus may be on 'consumer' products but there are several clauses that could definitely place requirement and responsibility on

producer and distributors for the recycling of professional products and non-consumer product; after all a PC, printer or mobile phone are used in all walks of life, and distinctions become blurred.

In a redraft of the original obligations, additional impositions are being made. The scope of the product base has been broadened to cover associated consumables, sub-assemblies, cables and components even if they are not part of the product at time of disposal, or not even produced by the named manufacturer. No more dumping into land fill for written off spare parts or product!

### The Aims of the Proposed Directive

- To prevent waste from electronic equipment
- To reuse, recycle or recover; disposal to base material elements is the last option
- To harmonise national legislation within the EU with respect to electronic waste
- To minimise the risk and impacts to the environment associated with the treatment and disposal
- To prevent the use of hazardous elements being used in manufacturing.

### Legislative Summary (WEEE):

- It applies to any consumer manufactured electronic product produced or distributed in the EU
- It applies retrospectively to product already in the market place
- The producer / distributor must set up Take-Back systems and be responsible for their control, management, funding reporting structure compliance
- There should be no charge to the consumer for this service
- Member states and producer's must meet set targets for the recycling / reuse of waste
- Political agreement in the European Parliament has been reached and WEEE is likely to be in legislation in 2002 and in force within three years of this date
- The Directive will be the subject of a common position, which once adopted, will be sent to the European Parliament for a second reading; a number of minor clarifications and amendments will occur during the next stages.

### Key Implications and Targets

Once the Directive is in force:

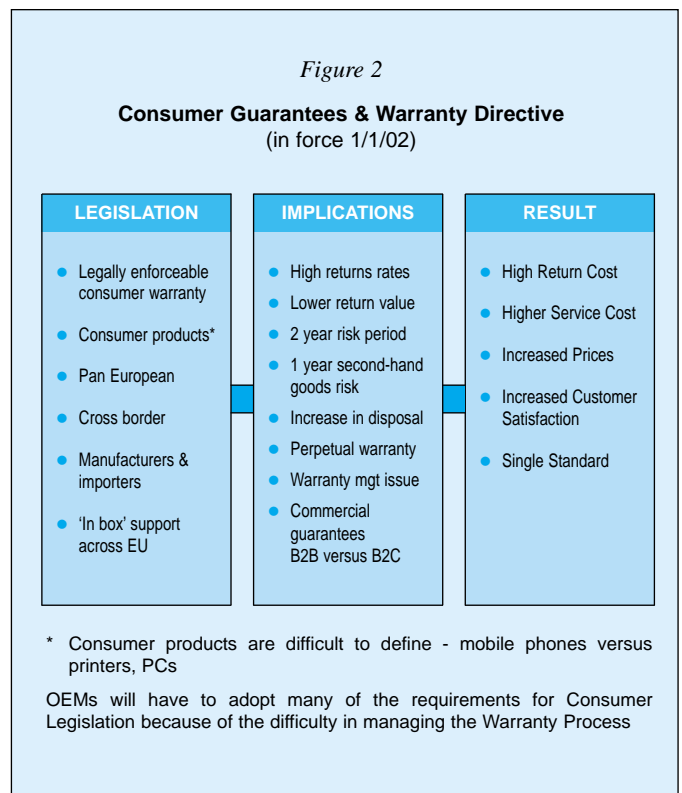
- Member states will have only 30 months (previously 5 years) to set up schemes for the separate collection of WEEE, financed by producers / distributors
- Member states will only have 36 months to set up collection targets, essentially set at 4kg per person per year
- Within 46 months Member States should achieve recovery in weight as follows:
  - 80% of large appliances; with 75% being reused or recycled

- 75% of telecom and IT product with 65% being reused or recycled
- At least 70% of small household appliances being reused or recycled

- Producers / distributors must comply with reporting requirements set by EU
- Funding from producers is likely to be on an individual basis in most Member States from the 30 month period, but collectively for historical waste up to that point (still under discussion)
- The Councils political agreement would confirm that manufacturers must fund costs associated with the management and recovery at End-of-Life
- The draft opens up the possibility for Member States to make producers pay for collection of waste appliances from consumer households, rather than from centralised collection points, as indicated in the Commission's original proposal. Thus significantly increasing potential costs for producers
- Producers may be free to decide whether they discharge the responsibility to dispose of product on a sole basis or in conjunction with other producers, thus assisting smaller companies to benefit from scale activity and reduce their costs.

### Further Impact Considerations

- EU Consumer Warranty legislation will increase consumer product returns significantly, with a subsequent impact on disposals and End-of-Life; manufacturing quality will be the key differentiator to limit this impact - see Figure 2.
- Economic viability of repair will be questionable on many consumer products due to the higher extended warranty costs and a new manufacturer's warranty on returned goods sales (1yr)
- The requirement for refurbishment / rework / spares recovery will become even greater.



## GETTING IT RIGHT

So, given the intricacies of the legal perspective, the reality is plain to see, manufacturers will have to pay for the recycling of product they produce. In Europe it will be mandatory, in the US commercial contract pressure and State legislation apply, but the result will be the same.

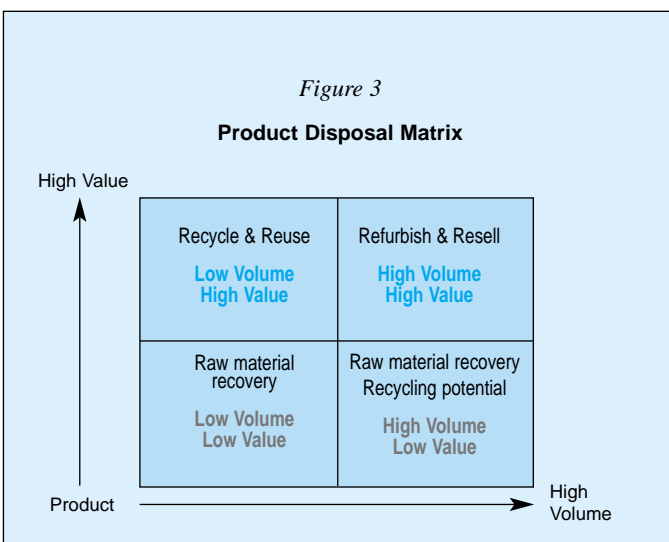
Response to this pressure must affect the way product is designed and manufactured in the future. For example, Sony are producing product without screws to make disassembly easier and thus minimise waste and time. Such an approach will reduce the downstream costs of decommissioning. Therefore a 'design in' approach to End-of-Life is required to minimise cost and maximise margin.

Even more adventurously, mobile phones are now being designed with advanced materials made from 'shape memory', such that on disposal the product self-disassembles (eg. screws and fasteners that lose their grip, and springs that expand to open the device) into graded materials upon the application of a range of temperatures – termed 'active disassembly' ([www.brunel.ac.uk/research/cleaner/index.html](http://www.brunel.ac.uk/research/cleaner/index.html)). This approach is more energy efficient than current shredding or chemical methods, and the gradation of materials makes parts reuse far more practical and cost effective to achieve.

So what about returned product? It may not be End-of-Life in the terms referred to above, but it may well be at the end of its economic life! A significant secondary piece of Consumer Legislation will in future mean that any refurbished product will have to carry a one-year manufacturer's guarantee. As a manufacturer the cost of supporting a returned item will suddenly increase dramatically, with service costs beyond affordability. Worse, consider the prospect of having to compete in the market place with your own product, still carrying one year's guarantee, which can be bought at a fraction of the new cost! The only option may well be to dispose or recycle on low value goods.

However, it is also realistic to expect a rise in the cost of product to the consumer to cover the End-of-Life responsibility. It is the quickest and easiest way in the short term, but pressure will certainly be brought to bear by both market and government. Companies who have anticipated the requirement and effectively set up End-of-Life processes will certainly add competitive pressure and result in further industry consolidation.

It is worth noting also that those companies who do not meet recycling targets will be fined. There will be an added incentive to make it work with either higher corporate taxes or direct fines imposed, for those considered not to be doing their bit for the environment and failing to meet recycling targets.



Companies should assess products to determine which disposal method would return the best revenue. It is noteworthy that product will be disposed not just because it has worn out, but for example its resale value will not cover repair and warranty costs, or it is technologically inferior. The product disposal matrix (Figure 1) sets out a basic decision making framework. However, as with all endeavour, the devil is in the detail. A more structured and detailed approach is required (see Figure 3).

To do this effectively manufacturers and distributors need to organise, and quickly! They need to follow defined steps in order to minimise costs and maximise revenue. What revenue I hear you ask? If well organised the recycling and disposal operations for manufacturing can return significant revenue.

With respect to corporate image, the value of a good environmental strategy does translate to the bottom line. Promotion of an environmentally friendly corporation has implications for key sales contracts, advertising and the potential to increase margins.

## PROCESS STEPS:

### 1. Product Risk Assessment

- What products do you have that are low value / low margin?
- Do you have significant volume in sales and what is their geographic dispersion?
- How do you service product currently - repair / exchange?
- How is product currently disposed?
- At what point does each solution to reuse / recycle or dispose become realistic?
- What are the potential secondary markets for each product set?

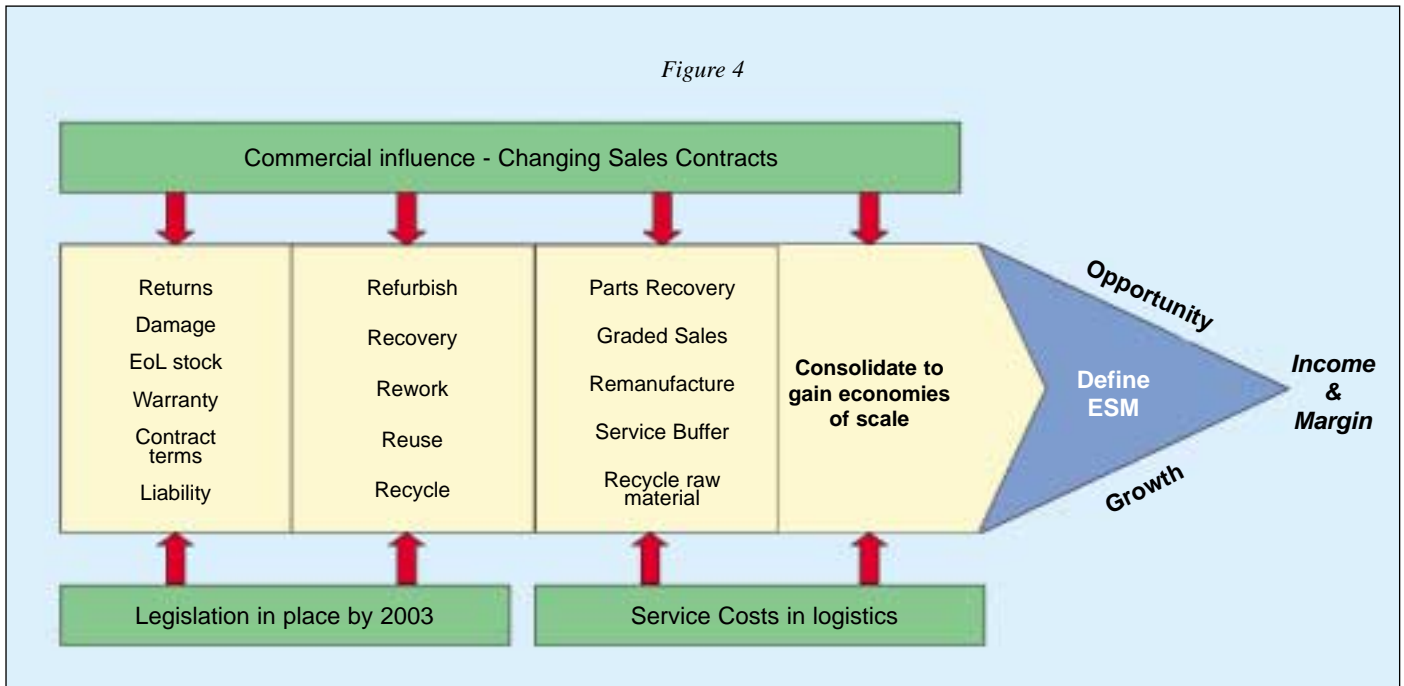
### 2. Infrastructure

- What environmental or Ecology Service Management (ESM)® strategy do you have?
- What organisational structure do you have to manage the End-of-Life stream and associated legislation?
- How will the cost be funded?
- What operational and project planning will be required?
- Who will support and advise?

### 3. Implementation Planning

- Segment products by appropriate method of recycling or disposal
- Volumetric and geographical location for logistical cost analysis
- If volumes are small, consider options for integrating service with other companies
- Select partner recyclers / logistical suppliers
- Select geographical area to be piloted
- Establish an End-of-Life screening operation, and whether in-house or outsourced

Figure 4



- Set in place MIS solution to capture operational data and meet the reporting / audit requirements
- Inform retailers / local suppliers of pilot scheme
- Establish a pilot scheme to assess operational performance and define procedures.

#### 4. Rollout

- Select products to be collected initially
- Inform retailers / customers / consumers (as appropriate) of the procedures to be followed
- Establish processing methodologies and control mechanisms
- Sample data off the MIS to determine effectiveness
- Assess recycling model for cost / benefit and adapt disposal channels as appropriate
- Incrementally expand product / customer / geographic coverage
- Assess performance of all operational activities
- Evaluate revenue stream and cost streams by product to assess cost of sales impact
- Actively communicate and market the process for corporate image profile.

#### CONCLUSION

It is clear that this will be a significant outlay for any manufacturer or distributor. It is also clear that there will be opportunities for logistics, recyclers and service companies, all of whom are looking to expand into this lucrative business opportunity.

The scope and opportunity is depicted in Figure 4.

Managing the process and preparation is key. Understanding your business and cost of sales is imperative. Look for

partners with experience in successfully designing End-of-Life operations and pilot initiatives to assess viability – more than most endeavours, this is an area where costs and benefits are in a state of constant flux, demanding continued vigilance and reappraisal of solutions.

The key to success for all parties is to:

- Understand the legislation and how it specifically applies to your business
- Segment reuse and recycling policies and practices according to product and market characteristics
- Achieve sufficient scale of volume to recover the financial outlay otherwise seek alternative means of gaining scale through consolidation
- Seek advice, to walk you through the legislation and avoid the pitfalls of operational failure or incur unnecessary costs.

#### About the authors

**Julian Mosquera** MIOM, is a partner with Logistics Consulting Partners and prior to joining LCP in 1994 he was a lecturer at Liverpool University where he had studied for a PhD in Logistics and Inventory Management.

A Member of The Institute of Operations Management and previous Chairman of its Qualifications and Awards Committee, he is a presenter on the Institute's public and in-company course programme. As a consultant Julian has assisted a wide variety of companies to improve their manufacturing and supply chain operations realising substantial operational benefits.

**Chris Foster** has recently joined Logistics Consulting Partners as a Principal Consultant, bringing a wealth of experience from the electronics industry, covering a variety of senior technical, customer and sales positions. He has gained a global perspective working for companies in Asia-Pacific, mainland Europe, the US and UK, with responsibilities ranging across consumer, IT, telecom and software industries for customer service, spare parts management and logistics, through to CRM design and implementation.