

# **Electronic Scrap and Producers Responsibility –**

## **Principles for an EEB position**

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### **1. Introduction**

The European Commission prepares a directive on take-back requirements on Waste from Electrical Equipment. A short outline of the available text is presented in the Annex. It seems that the Commissions activities have become necessary, since several national governments (NL, Flanders, Sweden, Germany) are about to or have introduced national take-back legislation with different basic approaches.

The following paper intends on the basis of the ongoing discussion to highlight the main points and problems of a potential directive and develop some principles and lines of arguments for certain positions. This shall be presented to experts for discussion and lead to an EEB position.

Any comments, criticism and further points are welcome.

### **2. The Problem**

There is a growing amount of WEEE. In 1992 about 4-6- Million tonnes of WEEE were produced – the estimates for now are in the range of 5,4 – 6,7 million tonnes.

In the case of some electronic goods life cycles become shorter. This applies especially to computers, which have a extremely short innovation rate.

Miniaturisation of electronic equipment reduces the tonnage of waste, but makes repair, collection and recycling more difficult.

Over the last decades the relative costs between repair and new electronic equipment have changed so dramatically, that repair services are only profitable for expensive and big electronic goods.

The problem with WEEE is less one of quantity, but more about the dimension of hazardous impacts associated with final disposal.

WEEE has components with hazardous potential, if landfilled and especially if incinerated: Heavy Metals, Arsenic, Halogenated Organic Chemicals, PVC etc.

So final treatment creates considerable problems, health hazards and especially costs. Partly they have a certain value, since they contain large amounts of wasted raw-materials, which have considerable market value, if they are recovered.

Presently WEEE is a typical case of market failure: The public has to pay final discharge and the social costs of health incidents, whereas the benefits of selling the goods and of

consuming them are private. The difference between social and private costs has to be addressed to make the market work properly.

No price reflecting the costs to final treatment contributes to the wrong design of products, to the use and release of toxic substances to the environment and to shorter life-cycles of products and components, finally to overconsumption of energy and materials.

Therefore market failure has to be addressed either by a market instrument or by regulation. The advantage of a market instrument is, that it leaves the freedom of entrepreneurial decision to companies. And this is an important source of innovation. So an indirect instrument should be preferred to direct control – and that is the attractive side of producers responsibility.

### **3. Producers Responsibility as one Solution**

Producers responsibility corrects market failure by reconverting social costs into private ones: The producer and hence later the consumer has to pay the full costs for end-of-life electronics.

Full producers responsibility will increase costs – but the instrument should not be only perceived as a burden to industry. It should also be perceived as a tool for innovation. The economic opportunities of strict producers responsibility are bigger, than the costs.

The costs of strong recycling-systems seldom exceed 5% of the product price ( see: AEA – Technology 1997). Taking into account that costs have to be born by local producers and foreign producers equally there is little threat to the competitiveness of the industry. The price elasticity of consumption on electronic goods does not seem so high, that full producers responsibility will lead to a remarkable decline of demand. Finally rather the opposite is true: producers responsibility will create a new market, hence new employment opportunities and in the long run a push factor for product innovation. Producers Responsibility is one instrument, to improve the durability, the repairfriendliness, the modular construction, the use of non-hazardous substances and the recyclability of consumer goods. It has to be seen as an important element of a comprehensive ecological product policy.

Producers who redesign their products to reduce costs for final disposal of electroscrap should get a market advantage. Innovation is urgently needed for an industry which has to survive tough world market competition. Furthermore producers responsibility creates incentives to set up a take-back infrastructure, to offer repair services and so on: all this are activities with local added value, where European Firms might get a comparative advantage over global ones. So it is a potential instrument for sustainable development creating synergies between economic and environmental objectives.

The idea of producers responsibility is not to let the industry pay more, but to have the society pay less. This is only a zero-sum game in the short run – in the long-run, if industry adjusts to the new prices, both will win.

At this stage little practical experience on the effectiveness of a take-back system can be reported: Netherlands and Switzerland have introduced producers responsibility, Norway and Sweden intend to do so as well as the EU Commission – in Germany an initiative has been postponed recently after the fierce lobbying of the telecommunications industry by the economic minister. So still we have to discuss ideas without practical experience and it is far from obvious, if producers responsibility as the only tool may be effective. It seems, that incentives for an other product policy cannot rely on Producers Responsibility only, but this might be a powerful element.

The following chapters address some fundamental points for an effective take-back regime.

#### **4. Definition of WEEE**

A definition should be found, which does not open loopholes (such as: export to third countries) and which is comprehensive.

A definition, which only refers to the fact, that EEE has entered the waste cycle is too narrow. By definition than any WEEE, which did not find its way into a waste collection system (i.e. by exports to third countries) would not be WEEE. The definition should follow the attempt of the PWS Project Group: „Waste is a product which is no longer being used for its intended purpose and is to be reused, recovered or disposed of“. This applies for the products as a whole. Reuse of WEEE normally relates to components – if an electronic equipment is reused as a whole, than naturally it is no waste. Nevertheless provisions should be made, that used products, which contain hazardous substances are not exported to third countries (for instance: refrigerators with CFC´s).

#### **5. Common or differentiated approach?**

WEEE is characterized by a great deal of diversity. This applies to the technical properties, the material composition, the respective potential for recycling, the established and potential systems of collection, recycling, reuse and final treatment and the structure of the industries. Any legislative approach has to take into account this high degree of diversity. The Electronic industries suggests to distinguish between four groups of EEE:

Commercial (Public authorities – Business), Non-Commercial ( Big and small) – each of them having specific characteristics of the collection system or the degree of standardisation etc.

Nevertheless a common approach should be chosen. The diversity of the sector makes a framework – type of legislation necessary, which defines basic principles and criteria, but leaves implementation to member states and the respective industries. Nevertheless the regulatory net of the framework directive should be as dense as feasible and there is no reason to postpone action by a sector by sector approach (German model).

Essential elements of this directive should be:

- *strict final disposal standards*
- *an ambitious collection policy, including organisational principles and incentives;*
- *A pricing mechanism allocating take-back and treatment costs to the producers*
- *Quality control of organisations, who collect and recycle*
- *A solution for Historical Scrap*
- *Safeguards against the export of WEEE and WEEE - Components*

#### **6. Producers Responsibility: How to make it an effective mechanism for Waste Prevention?**

Producers Responsibility consists of several elements:

- Direct or indirect take-back responsibility,
- Safe final disposal

- responsibility for collection and recycling of high quota of components (white, brown goods, cables etc.)

Take-back responsibility addresses the end of the chain and hopefully creates incentives for changes further upstream. But a number of crucial conditions have to be met to achieve this:

- the collection rate must be high,
- strict direct and indirect take-back requirements should be defined,
- Companies or their subcontractors, have to meet strict requirements for final treatment and disposal. There will be no solution to the environmental problems nor for the design of products, if everything is just put into a shredder or simply burned, without prior separation of components; therefore take-back companies have to be licensed and strict final treatment requirements defined

Safe final treatment regulations are required. This applies in the first instance for hazardous substances (e.g. prior treatment of CFC's or HFC's in refrigerators). Substances should be separated (e.g. PVC, other plastics etc) and safe final treatment requirements should be formulated. The EEB supports the Dutch model to forbid landfill and incineration of WEEE as a product. The political aim should be, that final treatment should be differentiated and not simply go to general landfills or incineration.

Different recycling targets should be set for different types of electronics. This approach only works, if the targets are set sufficiently high. The recycling targets suggested by the Commission, could be a good starting point. They should be gradually increased and should reach in average 80 – 90%. If they are low, only the components, which are easy to get recycled, such as the metal, will be recycled, but not those elements, which create the real problems at stage of final disposal. Furthermore it must be high quality recycling – incineration is not recycling but a form of final disposal. If you set recycling targets as low as the Netherlands or offer cheap ways out, then they will make little impact. They must be ambitious – and the original targets of the Commission might be a reasonable starting point. But beyond setting targets for a certain weight share of electronics it is necessary to sort out the toxic components and to define more specific recycling targets for the different materials, which are in WEEE.

If those conditions are not met, there is little hope, that the market will provide for sufficient incentives for product innovation. With weak requirements the resulting costs would make little impact on product design. The fundamental goal of producers responsibility is, that the new price structure provides for new information to producers. How this may be implemented will be discussed below.

## **7. Producers Responsibility versus shared Responsibility**

There is considerable pressure of industry towards a system of shared responsibility. Any take-back system has several stages, such as the collection, the separation of components, the reuse or recycling and the final disposal. Under a full producers responsibility regime the net costs of all activities have to be born by the respective industries. Under a shared regime, some of the activities (e.g. final disposal, collection) are paid by the public, some will be paid by industry. For instance consumers may take over a responsibility by a bring-back requirement. Furthermore the profits from selling components of WEEE can be shared among the different stakeholders. Collection may be within the responsibility of municipalities.

A general principle should be, that far reaching producers responsibility should be achieved. A maximum contribution by producers should be sought. A minimum requirement for

producers responsibility is, that producers have to pay the net costs for final treatment and for separation and recycling. They should also participate in the collection costs.

Since collection is often under the control of municipalities, they traditionally bear the costs. A take-back price for WEEE collected by municipalities to producers can be imagined (this is realized in the case of packaging in the framework of the DSD in Germany). There are some reasons for cost sharing in the collection phase: There is a public interest to have high collection rates – but there is also a certain private responsibility. Therefore a cost sharing approach for collection may be acceptable. It is not acceptable for the other elements of the recycling and final disposal cycle.

That means also, that the cost of „final“ disposal or treatment (e.g. incineration) should be borne by producers.

## 8. The Pricing System

The pricing system has to solve three basic problems:

- How to bridge the time lack between getting the product on the market and the time, where it is out of use?
- How to use pricing as a tool for better product design ?
- How to create a new market between the producers and the recycling and final treatment companies?

A special problem of producers responsibility is the time lack between the time of sale and the time of end-of-life equipment. For some durable consumer goods this period takes 15 – 20 years. Nobody knows costs for separation, recycling, finally disposal and the prices for raw materials today for the year 2015.

One solution might be the Dutch annual method. Producers pay the costs of take-back, which are created in the course of a certain calendar year. The costs may be distributed according the respective market share of that producer within this year. The advantage of this method is its simplicity and its capability to tackle the problem of historical waste (see below). The system would work like the generation treaty in many national pensions systems: today's working generation pays for the retired past working generation. The disadvantage is that there are little incentives in the system to redesign products. The cost advantages of redesigned goods can only be felt after 10 or 20 years.

Another approach would be to pay now the costs of take-back and treatment to be expected in 20 years and to apply a certain discount rate. This would correspond to the capital forming process in life-insurances. The problem with this approach, is the lack of knowledge about future costs, the choice of discount rate and the question, who controls the funds and according to which criteria they will be spent. In terms of incentives for product innovation the pricing system only is relevant, if differentiated pricing can be introduced.

Product innovation can only be promoted, if the producers of „green“ products get a market advantage over the others. This problem can be solved by a differentiated pricing system according to certain product design criteria. Such a system, would be interesting from an innovation point of view, but agreement of criteria and cost-sharing involves considerable political conflicts. Eventually differentiated pricing can be linked to criteria developed in the framework of the eco-label scheme. The implementation of a differentiated pricing system creates big practical problems, because this requires either that a regulator decides, what an environmentally friendly design and the respective price differential is or that industry itself agrees upon a differentiated price system. Unfortunately a shadow price system is needed,

since different market prices for low - and non-hazardous WEEE and high and hazardous do not exist. Both require a similar type of treatment for recycling ( but eventually not for final use).

The third problem is discussed in the next chapter.

## 9. Organisational Responsibilities and Certification

Financial take back responsibility must not be identical to organisational take back responsibility. Different take back and collection systems can be imagined, such as:

- Collection by municipalities in the framework of local waste collection systems;
- Collection by retailer
- Individual or joint collection by the respective industries
- Bring-back responsibility by consumers ( to collection points of trade, municipalities or industry subcontractors).

Also sorting, separation, recycling and final disposal can be done by any type of private subcontracting enterprise. It is important that such subcontractors meet a number of minimum qualifications and requirements, which must be well defined (as it is for example the case in the German ordinance for End-of-life vehicles). Furthermore those enterprises must be certified by respective competent bodies, to meet the essential quality criteria.

Payment of those take-back and recycling companies is an open question. One can imagine a:

- Joint fund solution with a negotiated price between the producers associations and the take-back associations (i.e. on the basis of tons of treated WEEE eventually differentiated according to broad categories). The disadvantage of this solution is a cartell-like pricing regime, with little scope for market transactions and price-differentials for innovators (both on the recycling and the production side);
- Individual contracting between recycling companies and producers: This system requires a differentiated and controllable reporting system, on how many goods of what type have been reported. The establishment of such a reporting system would be expensive --but it would allow for a better market type of transactions between producers and recyclers. It would be technically feasible if an automatic registration system like the ENA, now available for most supermarket goods, will also be applied for the electroscrap. Then bookkeeping on different types of products will be very easy and hence also market transactions between producers and recyclers and also a differentiated price regime for „clean“ and „conventional“ products.

So in the long-run the second system should be promoted to let the market forces work – in the short run more collective systems seem to be unavoidable.

## 10. Deposit and Refund-Systems to increase collection rate

Incentives should be created, to make the collection rate as high as possible. This especially applies for small WEEE, which under normal circumstances might be thrown into the ordinary municipal waste. A deposit system might be a strong incentive. So a deposit should be paid, if the electronic equipment is bought, which later on will be refunded, if it is brought back. The refund should be higher than the deposit (according to commercial interest rates) to create further incentives to consumers and to avoid undue redistribution between consumers and those, who get the deposit.

## 11. Targets for Recycling

Targets for recycling should be set at a high level. A phased approach can be imagined, according to the technical progress on recycling. The essential criterium for the recycling target cannot be cost-benefit analysis only, but technical feasibility. It is evident, that the marginal costs increase with the percentage of what should be recycled and that there is a remaining part, whose recycling costs are beyond economic (and eventually also ecological) rationality. It should be a political decision on what is feasible and economically acceptable as recycling target. The suggested targets by the Commission might be a good starting point, but it should be made more dynamic by also defining more farreaching medium term targets.

Furthermore recycling targets for certain components of WEEE should be developed

## **12. Historical Waste**

As it is already practice in the Netherlands, historical Waste should be included in the producers responsibility system. There is no reason, why producers should free ride for the coming decades and let the public pay. So a responsibility exists from the moment, a directive has become effective. Historical waste is automatically included, if an annuity method for cost charging will be applied. Without including historical waste, the time lag until costs are really felt and create incentives for other product design, would be too long.

## **13. Voluntary Agreement versus Legal Approach**

Producers responsibility for WEEE has been on the agenda for 10 years. There have been several attempts to organise voluntary agreements – but sofar this failed and was a strategy to postpone action.

Therefore a legal frame is needed. This legal frame has to define the principles, the fundamental mechanisms of cost allocation, the collection and recycling targets and minimum criteria for product design, take-back requirements, treatment and final disposal. Nevertheless there seems to be some scope for a negotiated approach with industry, if it meets the essential requirements and can prove and control enforcement. The essential criteria for successful voluntary agreements (see: EEA 1997; EU-Commission 1996) however have to apply (transparency, sanctions, enforcement, monitoring, legal character (contract) etc.).

## **14. Product Design Requirements and Hazardous Substances**

- Producers responsibility implies also the prevention of waste. This requires:
- Responsibility for the design of products, including:
  - Application of the substitution principle, replace hazardous by less hazardous alternatives;
  - Some fundamental design principles, durability, modular structure, repair friendly, complete recycling etc.

The problem with product design requirements is, that it is nearly impossible, to make detailed prescriptions, how thousands of different products shall be designed. It also would contradict to market principles.

Therefore a softer approach has to be chosen. This may start with voluntary schemes, like ecolabel and consumer information on the most environmentally friendly design – but also move towards more controversial issues. Also more procedural requirements should be set:

- Following the Scandinavian experience, electronics producers could be asked to substitute hazardous substances (in a life-cycle perspective), by non-hazardous. This widens the agenda – from waste policies to product design and chemicals policies. In theory it might be the most effective strategy – but at the end it might create much political resistance. Phasing out PVC for instance is a horizontal issue, which does not apply to electronics only. A horizontal legislation is certainly necessary, but it may be blocked and postponed by industry for some time. Furthermore the availability of less hazardous substitutes to PVC or to bromide flame retardants is different for the different applications. This means, that there is no way out, to have also sector specific discussions on broader issues.
- A general reporting requirement: what strategies companies follow, to meet the above mentioned general product design criteria.

So producers responsibility can only be one element of a more comprehensive strategy towards greener products.  
One fundamental incentive may result from the pricing mechanism, suggested in this paper.

## **Conclusions**

A crucial lesson can be drawn: the precondition for the proper functioning of a market instrument like producers responsibility is strict regulation as regards final disposal, collection, performance of take-back companies and monitoring. Free-riders and loopholes must be avoided, to let the market properly work. The more this approach is supported, the less direct regulation on product design is needed. The better producers responsibility works, the better it may be for the competitiveness of the electronic industry and for the environment.