



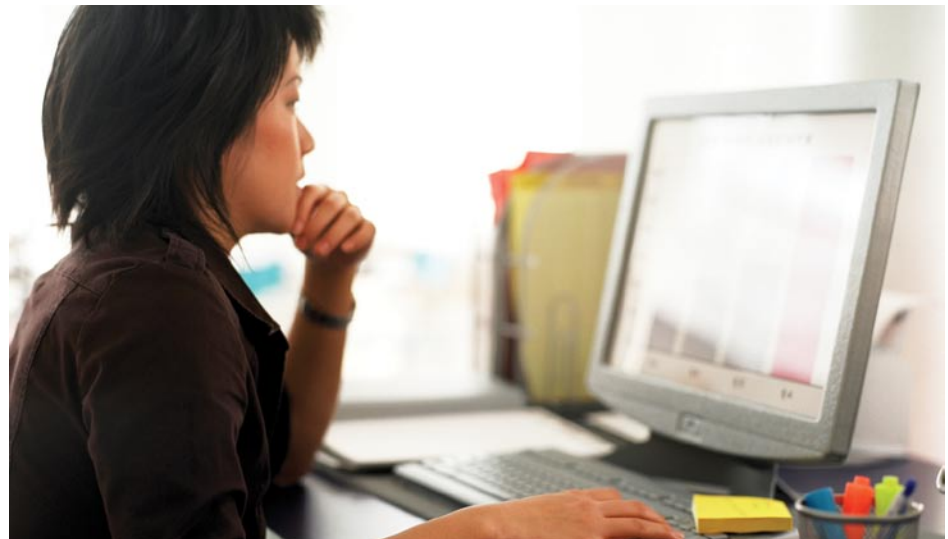
How Producer Responsibility for Product Take-Back Can Promote Eco-Design

Individual producer responsibility encourages competition between companies on how to manage the end-of-life phase of their products. This in turn drives innovation, such as in business models, take-back logistics and design changes, to reduce the environmental impact of products at the end of their life.

JOINT STATEMENT BY A GROUP OF INDUSTRY AND NGOS
on Producer Responsibility for Waste Electrical and Electronic Equipment, March 2, 2007

Extended Producer Responsibility (EPR) often termed producer take-back, is an increasingly popular waste policy that is radically different from traditional recycling practices. This is because EPR makes the producer of the product responsible for the financial and/or physical responsibility for product recycling. In its true form EPR also extends the responsibility of the producer to the entire life cycle of the product chain—from production through to end of life waste management. However the end of life product stage has become the popular focus for most EPR policy and in Europe producers are now financially responsible for the take back and recycling of batteries, packaging, vehicles and all electrical and electronic consumer products.¹ In Japan producers are responsible for recycling cars and electronic products² and in Canada many provinces are now passing take-back laws for paints, batteries, tires, packaging and electronics.³ Almost half the states in the US have passed or are about to pass take-back legislation for electronic waste.⁴

In an effective EPR scheme the true cost of waste management is internalized within the retail price and companies, because they are now financially responsible, will seek to reduce these costs to remain competitive. This in turn promotes



eco-design of products because it is assumed that if producers have to deal with their own product waste they will have more incentive to use recyclable materials or materials that will not generate hazardous waste management costs for them. The establishment of these feedback loops from the downstream (waste handling) to the upstream (the producer of the product) is the core of EPR that distinguishes EPR from a mere take-back system. For example it becomes cost effective for a product designer not to use a mercury switch in an electronic appliance if this will result in not paying hazardous waste costs at the product's end of life stage. Instead the designer would more likely substitute a

non-mercury alternative, even if it costs slightly more. Also producers would design for re-use, and ease of disassembly and recycling because this would also save them money.

The goal of eco-design is stated in the preamble of producer responsibility legislation for cars and electronic products in Europe and the Environment Commissioner at the time the Waste from Electrical and Electronic Equipment (WEEE) Directive was implemented, announced:⁵

“I am particularly pleased we could convince Member States to strengthen the individual responsibility of producers for the waste from their products. This will be an important

incentive for producers to take environmental consequences into account already when they stand around the design table.”

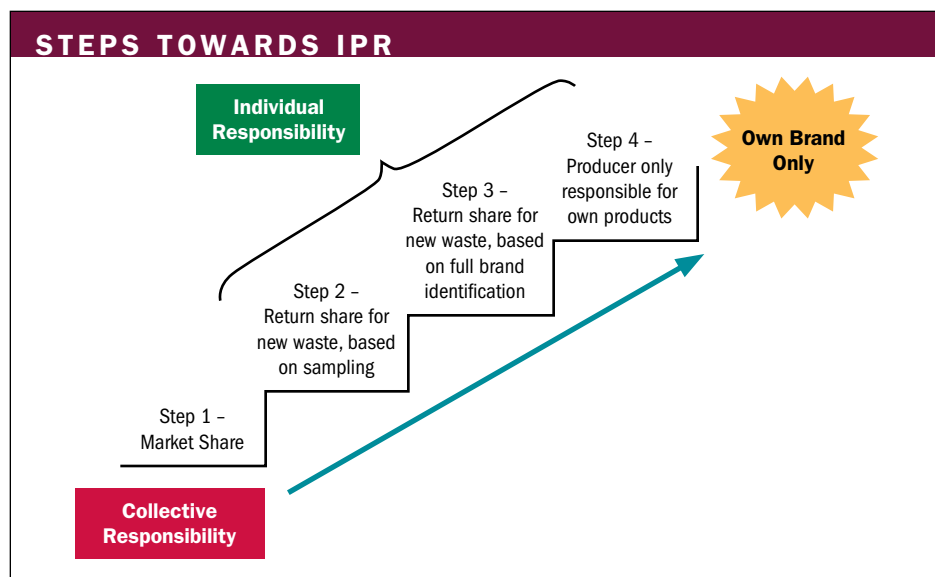
Incentives for Eco-Design

In reality the link between eco-design and producer responsibility is complex and evolving. It is therefore essential that all EPR frameworks ensure that producers can achieve credit for eco-design changes in their products. The following summarizes some of the lessons learned to date.

➤ A take-back system based on Individual Producer Responsibility (IPR) ensures that producers are responsible for recycling their own products

Individual producer responsibility (IPR) is a policy tool that makes producers financially and/or physically responsible for the end of life management of their own products. This is different from collective responsibility where the industry sector as a whole is responsible for the financial cost of collecting and recycling all products, regardless of brand name differentiation. IPR ensures that producers are responsible for recycling their own products and this has been implemented in various ways.

In Europe, for example, the WEEE Directive promotes IPR for new electronic products put on the market as of 13 August 2005. For older historical e-waste and for orphan products, whose producers are no longer on the market, producers in the EU are collectively responsible and pay a portion of the total costs of collection and recycling according to their current market share. It was argued that because historical waste such as old TVs were often made with hazardous and unrecyclable materials, they can not be redesigned retroactively, which is why a time limited period for a collective responsibility approach to historic waste



Source: Developing Practical Solutions to Individual Producer Responsibility. www.iprworks.org

was allowed. However, Europeans envisage that once this historical and orphan waste is cleaned up—for instance by 2020—true individual producer responsibility can be realized which is the main goal of the legislation.

In the US many states have observed that European nation states may not adequately transpose the WEEE Directive to ensure this transition to full IPR and have therefore taken the proactive step of implementing an all encompassing IPR system from the start. When an IPR-only system is used for both historic and future waste, an additional mechanism needs to be included to pay for orphan products. In the US, this is accomplished by dividing orphan waste costs among the existing companies—sometimes by market share, sometimes by return share.⁶

➤ A flat fee on products, regardless of brand, gives no credit for eco-design initiatives.

Many legislators in the US and Canada recommend a fee on new products to finance the cost of recycling both historic and future waste. However the standardization of fees on all products, regardless of the brand, provides no direct feedback to the producer for eco-design changes in new products. The system may seem to

guarantee funding for recycling into the future but making producers individually responsible for new products is more competitive and allows companies to achieve credit for eco-design changes through market instruments.

For example, producers in Europe are currently allowed to charge a visible fee on new products to pay for the recycling costs of historic waste and orphan waste. This fee is only allowed for a fixed period (8–10 years depending on product category) after which producers will have to incorporate the waste management costs into the retail price of their products. This is very different from the California system—the only US state to use a visible fee—where the fee is collected not by the manufacturers but by the state government who pays for recycling. The manufacturers are not in the loop at all nor is there a plan to transition to IPR for future waste.

In addition producers are also required in Europe to provide a financial guarantee to prevent the costs of future orphan products from falling on society or the remaining producers if a producer goes bankrupt. In Sweden, for example, car producers pay a guarantee to an insurance company which negotiates different premiums with each producer. Estimated future recycling costs are based on test scrapping and the easier the car is to recycle, the lower the premium.⁷

➤ **Differentiating brand name products can be done in a large scale take-back system.**

It is often assumed that individual producer responsibility would entail each producer setting up their own take-back and recycling system. This is not the case. A producer could set up their own brand specific take back system or they can join a collective system in which their brands can be identified.

The most common form of brand specific take-back is the business to business (B2B) models where take-back is often bundled with other value added services such as data removal and installation services of new equipment. Since 1991 Xerox Corporation's business leasing model, for example, has enabled it to build up a comprehensive design for environment program whereby products are repaired or re-manufactured.

In a collective scheme producers can separate out their products in a variety of ways to pay the true cost of their product take-back and recycling. Indeed, this is happening in some collective schemes operating today.

Products can be sorted by brand once they are collected from consumers at collection points such as retailers and municipal collection points.⁸ For instance in Switzerland coffee machines are separated out from the rest of WEEE by retailers and then producers pay for their recycling at their own facilities. In Sweden and Norway computers and other IT equipment are sorted at the separate collection points by an intermediary company upon request and the cost of recovery is paid for by cost internalization. In Japan retailers, municipalities and others bring discarded large home appliances, such as stoves and refrigerators, to two regional stations depending on the brands. The appliances are then recovered in the company's own facility or the producers contract with other producers and recyclers.

Brand name differentiation can also be done at the recovery facilities themselves.

In Japan each large home appliance has a manifest attached to each product which distinguishes the brand name and the model of the respective producers. In Switzerland periodic sampling of IT equipment takes place to determine the average amount of products taken back of a particular brand. The producers then pay for their return share in the total waste stream. In the United States, both Maine and Washington states have advocated IPR for e-waste through return share.

➤ **The transition to full Individual Producer Responsibility is supported by many companies.**

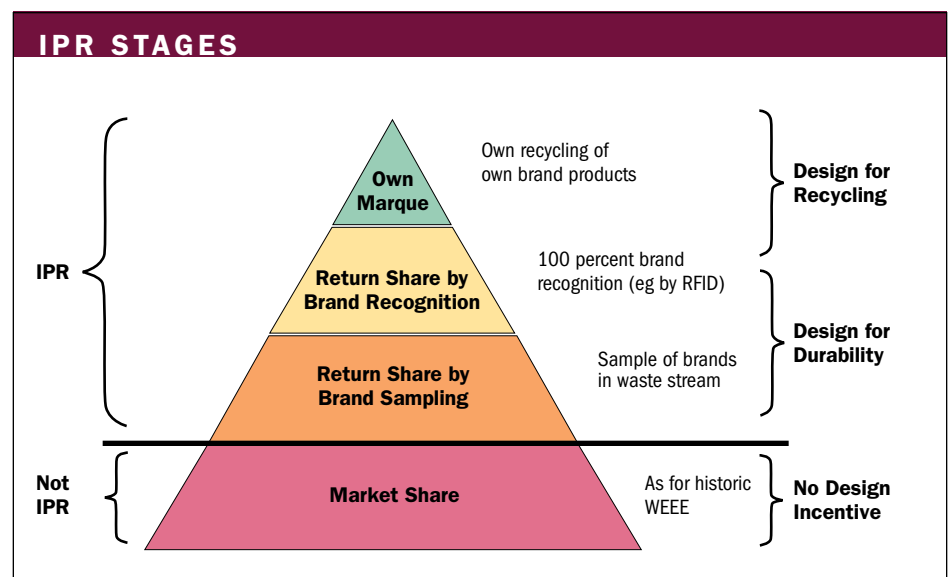
In a collective system where producers are jointly responsible for the recycling of all products, including the products sold in the future, there is no incentive to design products to be easier to recycle. That is because producers would simply be paying a proportion of the total cost based on their market share. This may be a temporary option for historic waste, as discussed above, but it provides no incentive for cost effective eco-design changes in new products. As business proponents of IPR point out, collective producer responsibility may in fact achieve the opposite since "the costs of recycling will be the same for a product that has been designed

to be easier to recycle and a product that is much more difficult to disassemble and recycle."⁹

Costs to producers based on return share where discarded products are separated by brand or by random sampling at recycling facilities is a better reflection of the true cost to recycle their products and even provides an incentive to design for durability. It is anticipated that product identification at recycling sites using radio frequency identification (RFID) will be mainstream in the near future and this could also provide recyclers with material and treatment information.

"Electrolux is an early advocate of producer responsibility. We were among the first in our industry to identify the business case for recycling and lobby actively for individual responsibility."¹⁰

There are a number of producers that now publicly support IPR. Dell's Global Recycling Policy officially supports IPR and offers free take-back of computer systems of any brand when purchasing a new Dell system as well as free take-back of its own brand worldwide. Apple offers free recycling with purchase and Sony offers free takeback of its products in North America. HP is also a strong promoter of IPR and is working to ensure global coverage.



Source: Developing Practical Solutions to Individual Producer Responsibility. www.iprworks.org

Other companies now publicly support IPR including Samsung, Sony Ericsson, Lenovo, LGE, Fujitsu-Siemens, Nokia, and Acer.¹¹ Electrolux is a champion of IPR and along with Sony, Braun and HP established the European Recycling Platform in 2003 to advocate for IPR. Other companies and NGOs have formed a group to lobby for proper implementation of individual producer responsibility in take-back legislation as well as research eco-design incentives.¹² As one member asks: “The question producers should ask themselves in developing their approach to EPR is perhaps not “*how do we implement individual responsibility for our branded products,*” but “*how do we secure financial advantage from our improved designs.*”¹³

► Anticipating Individual Producer Responsibility Legislation has led to proactive product design change.

Interviews with Japanese electronic manufacturers and Swedish car manufacturers in 2000 reveal that the anticipation of EPR regulations, which companies anticipated would make them individually (not collectively) financially responsible for their end-of-life products, was a catalyst for redesigning products to be more recyclable and less toxic. While European take-back directives were being drafted, Japan was also developing its own take-back laws. EPR legislation sent signals to producers that end of life costs would have to be factored into future product design.

In particular the European directives on End of Life Vehicles, Waste from Electrical and Electronic Equipment, and the Restriction on Hazardous Substances (RoHS) catalyzed the Japanese industry to be proactive and ahead of their European competitors. In response to growing EPR legislation initiatives companies took a variety of financial and resource saving measures.¹⁴ NEC, Hitachi, Fujitsu, Matsushita and Sony replaced plastic housings with magnesium alloy—a more recyclable material—for TV cabinets and personal

computers. Similarly Matsushita, Sharp, Mitsubishi, Ricoh, and Hitachi switched to more standardized types and grades of plastics for their products. Hitachi and Mitsubishi focused on easier repair and maintenance of their products while NEC, Ricoh and Fujitsu adopted modular designs to facilitate component re-use. The impending RoHS directive provided the incentive for Japanese manufacturers to be ahead of European law by switching to lead-free solders.¹⁵

Car manufacturers in Sweden and Japan also reacted to impending EPR legislation through design change. Swedish car manufacturers, in particular Volvo,

SAAB, and Volvo Trucks established lists of substances targeted for phase-out and worked on improving vehicle design for quicker disassembly and better recycling. Toyota succeeded in developing thermoplastics called TSOP (Toyota Super Olefin Polymer) that can be recycled for the same purpose (recycling instead of down-cycling), while having other properties such as durability and mould-ability. It also started to use polyurethane and fibers recovered from auto-shredder dust as noise buffers in new cars. Fuji Heavy Industry established a system of collecting glass from end-of-life vehicles and recycling it for glass wool.¹⁶

Promoting Good EPR Legislation

In a spate of studies released last year, Chinese scientists documented the environmental plight of Guiyu, in China (where much of the e-scrap is sent from the United States). The air near some electronics salvage operations that remain open contains the highest amounts of dioxin measured anywhere in the world.¹⁷

— NATIONAL GEOGRAPHIC. January 2008

The following are some of the key elements of a good Extended Producer Responsibility policy that will provide incentives for eco-design.¹⁸ In any take-back legislation it is recommended that:

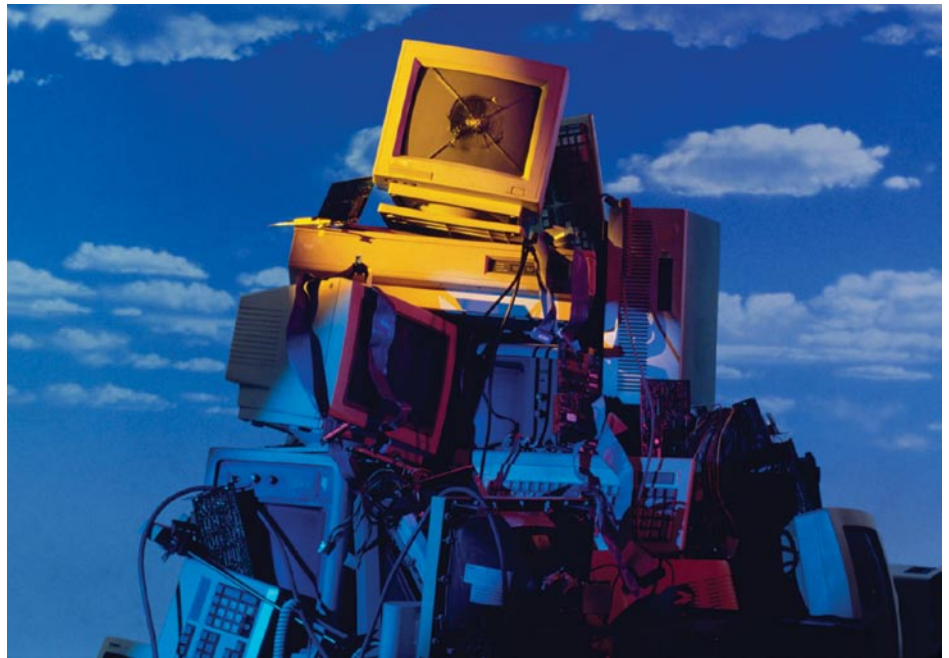
- 1. The responsibility must clearly focus on the producer.** Many industrial sectors are particularly alarmed at the prospect of Extended Producer Responsibility and are lob-



Hewlett Packard recycling facility

bying to dilute their responsibilities for used products. Instead of EPR, they favor 'Extended Stakeholder Responsibility' that transfers much of their liability onto consumers, or the even weaker term 'Product Stewardship'. However, if the objectives are indeed to reduce the use of resources through a better choice of materials and product design, then producers should be targeted. Producers are the actors with the greatest leverage over environmental improvement of their products—not the government nor the consumer.

- 2. Producers must be individually responsible for their own brand name products.** Producers are free to set up their own take-back system or work collectively with other producers to differentiate their products from the total waste stream.
- 3. Historic waste and orphan waste can be dealt with in many ways.** The way that a producer contributes to the total cost of collecting and recycling historic waste can be done in many ways. Europe has allowed a time-limited collective responsibility for historic waste which transitions into full IPR for all products put on the market as of mid August 2005. There are concerns by many producers who wish to set up their own individual collection and take-back systems that some countries within the EU may not effectively ensure this transition to IPR and they are lobbying the EU to ensure the WEEE Directive is properly transposed. Alternatively, as in many US states, producers and legislators can immediately implement IPR for all waste including historic, while also ensuring that the collection and recycling costs of orphan products are effectively shared.



- 4. The full costs of end-of-life, including collection, are internalized in the retail price.** In many countries with EPR systems, municipalities continue to subsidize collection. This ends up costing the tax payer.
- 5. Future costs of recycling are covered through financial guarantees from each producer.** The guarantees can be calculated to provide some incentive for eco-design.
- 6. High recycling standards are mandated and producers are responsible for achieving a high level of recycling rates.** High recycling standards include strict controls on hazardous emissions to protect workers. High recycling rates ensure high-quality material recycling, not 'downcycling' where materials are recycled into inferior quality. The current export of e-waste for recycling is a low cost avoidance of high quality recycling and should be prohibited.
- 7. Hazardous chemicals and materials are eliminated in product design.** The Restriction on Hazardous Substances Directive in the EU is a major catalyst to substitute toxic chemicals and materials in electronic products. Comprehensive take-back policies must include clear policies on the elimination of hazardous materials.
- 8. Land filling, export and incineration of end of life products is not considered recycling.** In particular the export of e-waste to the developing world is prohibited.

*Written by Beverley Thorpe, March 2008.
For more information please contact the author.*

ENDNOTES

- 1 In September 2000 the European Union (EU) adopted the End of Life Vehicle (ELV) Directive that requires producers to take back and manage obsolete vehicles. The directive establishes recycling targets which increase with time and phases out the use of certain hazardous substances. Soon after in January 2003 the EU passed the Directive on Waste from Electrical and Electronic Equipment (WEEE) and its partner directive, the Restriction on Hazardous Substances (RoHS). The WEEE directive mandates collection and recycling targets for all historic electronic waste and makes producers individually responsible for products put on the market as of 2005. The RoHS Directive mandates the phase out of certain heavy metals and brominated flame retardants for these new products. In 1990 Germany introduced the Green Dot take-back system for packaging and this has catalyzed packaging legislation in many European countries; while producer responsibility for batteries is enshrined in the Battery Directive. Ends Report provides links to many of the EU Directives and policy development. Visit www.endsreport.com
- 2 For an overview of EPR in Japan see the Japanese website at <http://www.meti.go.jp/policy/.recycle/main/english/law/legislation.html>
Also visit the International Institute for Industrial Environmental Economics at Lund University, Sweden. EPR research by Naoko Tojo and Thomas Lindhqvist can be accessed at <http://www.iiee.lu.se>
- 3 For an overview of EPR in Canada see www.epsc.ca
- 4 For an overview of US state legislation visit: www.electronicstakeback.com
- 5 European Commission Press Release IP/021463
- 6 Almost half the US states have passed or are considering passing full IPR legislation. For more information visit the state legislation section of www.electronicstakeback.com
- 7 Developing Practical Approaches to Individual Producer Responsibility. Mark Dempsey, HP. October 2007. www.iprworks.org
- 8 For a more in depth look at IPR within collective schemes see Tojo, Naoko. (2001). Effectiveness of EPR Programme in Design Change. Study of the Factors that Affect the Swedish and Japanese EEE and Automobile Manufacturers. IIIIE Report 2001:19. Lund: IIIIE, Lund University. Also see Tojo, Naoko. (2004). Extended Producer Responsibility as a Driver for Design Change—Utopia or Reality? IIIIE Dissertations 2004:2. Lund: IIIIE, Lund University.
- 9 A full discussion is given in About IPR: Q&A section at www.iprworks.org
- 10 Source: <http://www.electrolux.com/node195.aspx>
- 11 For an overview of companies take-back policies visit the Greenpeace Guide to Greener Electronics. Check for updates every quarter at <http://www.greenpeace.org/international/campaigns/toxics/electronics/how-the-companies-line-up>
- 12 The group is composed of AB Electrolux, Braun, European Environmental Bureau, Greenpeace International, Hewlett Packard, Länsförsäkringar Insurance, Sony Europe, Stena Technoworld AB
- 13 Mark Dempsey. Developing Practical Approaches to Individual Producer Responsibility. October 2007. www.iprworks.org
- 14 Van Rossem, C, Tojo, N and Lindhqvist, T. EPR: An Examination of its Impact on Innovation and Greening Products. Report commissioned by Greenpeace International, Friends of the Earth Europe and the European Environmental Bureau. September 2006. Report can be downloaded at <http://www.greenpeace.org/eu-unit/press-centre/reports/extendend-producer-responsibil> See reference 1, Table 3-1: Examples of criteria and concrete measures taken to enhance resource efficiency and recyclability by EEE manufacturers in Japan. Page 15.
- 15 Ibid. See reference 1, Table 3-2. Examples of measures taken in relation to elimination/reduction of hazardous substances by EEE manufacturers in Japan. Page 18.
- 16 Ibid. See page 20.
- 17 National Geographic Feature article. January 2008. <http://ngm.nationalgeographic.com/ngm/2008-01/high-tech-trash/carroll-text.html>
- 18 Further resources: in Europe visit www.erp-recycling.org; <http://www.iiee.lu.se/>; www.iprworks.org; in North America visit: www.etbc.org, www.cleanproduction.org; <http://www.productpolicy.org/>; <http://www.epsc.ca/>