

Extended Producer Responsibility

An examination of its impact on innovation and greening products

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Report commissioned by Greenpeace International, Friends of the Earth and the European Environmental Bureau (EEB)

Executive Summary

This report, commissioned by Greenpeace International, Friends of the Earth and the European Environmental Bureau (EEB), explores the impact of Extended Producer Responsibility (EPR) on innovation and the greening of products. It aims to reiterate the value that EPR has as a policy principle to improve the environmental performance of products and their connected systems and that this can be best achieved when the feedback loop of waste management costs goes directly to the individual producer. The report is structured to provide a background of the emergence and development of EPR since the early 1990s, its actual implementation through a variety of policy instruments (administrative, economic and informative), and its role in addressing waste prevention and management.

Key elements of effective EPR implementation

Generally speaking, effective implementation of EPR should bring the achievement of two main environmentally-related goals: 1) *Design improvements of products* – the EPR system should provide incentives for manufacturers to improve products and systems surrounding the life cycle of products. 2) *High use of product and material quality through effective collection and re-use or recycling* – this goal can be sub-divided into three sub-goals, which are a) effective collection, b) environmentally-sound treatment of collected products and c) high use of products and materials in the form of re-use and recycling.

Among these policy goals, the report focuses on the possibilities for the EPR principle to promote design change of products. A principal reason for allocating responsibility to producers is their capacity to make changes *at source* to reduce the environmental impacts of their product throughout its life cycle. It is essentially the producers that decide the features of the products they manufacture at the design phase of products. Rational manufacturers, when made responsible for end-of-life management of their products financially and/or physically, would presumably try to find a way to minimise the costs associated with end-of-life management by changing the design of their products. The establishment of such feedback loops from the downstream (end-of-life management) to the upstream (design of products) is the core of the EPR principle that distinguishes EPR from a mere take-back system. Assigning responsibility primarily to one actor would also avoid the situation where everyone's responsibility becomes no one's responsibility.

There is both implicit and explicit evidence of the impact of EPR on Product Design

Although it is recognised that determinants of product innovation are likely to come from a variety of push and pull factors including law, consumer preferences, customer requirements, etc, this report has been able to present supporting evidence that the anticipation of EPR law has been central for specific design changes for the products investigated. Tojo (2004) provides empirical evidence that EPR law does provide tangible incentives for environmentally-conscious design in the case of electrical and electronic equipment (EEE) and cars in Japan and Sweden. The analysis of her interviews in 2001 revealed that all manufacturers that were interviewed considered anticipated regulatory requirements posed by EPR law in their product development strategies. Upstream measures in design, both in terms of reduction of hazardous substances and enhancement of source reduction of material use, re-use and recycling, have been undertaken in both industry sectors in Sweden and Japan respectively.

Section 3 of this report provides concrete examples of such upstream changes in product design in anticipation of regulatory requirements posed by EPR law. For example, several Japanese EEE manufacturers have made material substitutions to increase the recyclability of their products. Specifically, NEC, Hitachi, Fujitsu, Matsushita and Sony have replaced

plastic housings with magnesium alloy for TV cabinets and personal computers, owing to the low plastic recycling results. Similarly, efforts have been made to improve the recyclability of products through material unification and standardisation of types and grades of plastics used in products (Matsushita, Sharp, Mitsubishi, Ricoh, and Hitachi). Ease of repair and maintenance have been provided by manufacturers such as Hitachi and Mitsubishi, and several manufacturers have adopted modular designs to facilitate component re-use (NEC, Ricoh, and Fujitsu). The use of lead-free solders was implemented with an advance time plan by many Japanese manufacturers so as to be ahead of European law. Ericsson decided to eliminate the use of beryllium, anticipating future recycling advantages. Automotive manufacturers in Sweden (Volvo, SAAB, and Volvo Trucks) have similarly established lists of substances targeted for phase-out and worked on design for disassembly and design for recycling.

In addition to these findings, evidence from corporate environmental and sustainability reports, as recently as 2005, explicitly mention the influence of both the WEEE (Waste Electrical and Electronic Equipment) and the RoHS (Restriction of Hazardous Substances in EEE) Directives on product design. The global influence of the European RoHS Directive – considered as EPR-based policy in accordance with the definition of EPR in this report – on product design change has been far-reaching. It is illustrated that Japanese electronics manufacturers accelerated their compliance efforts in an attempt to gain market share over European and US rivals.

Improved use and handling of discarded products

For the ELV and WEEE Directives, we see not only an impact on the design of new products. The EPR discussion and subsequent law has also led to considerable improvements in the collection of discarded products, treatment of these products and use of components and materials incorporated in the products. De-pollution in the dismantling stage has seen improvements, as has the general treatment at dismantling and recycling facilities. These improvements concern the development of new techniques, but also better control of existing practices. Recycling levels have increased as a result of the targets set in the Directives. However, there is still room for considerable advances in technologies and in control of dismantling and recycling activities.

Individual-versus-collective Responsibility

Concerning the implementation mechanisms of EPR programmes that incorporate take-back and other requirements related to the downstream operation, a notable distinction could be made with regard to the degree of cooperation among producers in fulfilling their responsibility. This distinction is often referred to as individual-versus-collective responsibility. That is, in essence, if a producer takes responsibility for end-of-life management of their own products (*individual responsibility*) or producers in the same product group together fulfil their responsibility for the end-of-life management of their products regardless of the brand (*collective responsibility*). The significance of this issue, among other things, was manifested, in the lengthy discussions during the development of the EU WEEE Directive.

The distinction touches upon a fundamental question surrounding EPR: how should producers fulfil their responsibility to create incentives for design change? Our research finds that Individual Producer Responsibility (IPR) is a better incentive for design change because the feedback loop to the manufacturer is more efficient in rewarding design change through lower costs at end-of-life. Experience from manufacturers of electrical and

electronic equipment and automobiles in both Japan and Sweden shows that such systems have resulted in design change.

If producers need to take care of discarded products similar to their own irrespective of brand, there are few or no incentives to spend extra resources enhancing their product design to reduce environmental impacts from end-of-life. If responsibilities were distributed among brands without considering the difference of environmental properties of the products, producers who worked harder to reduce environmental impacts from their products would end up subsidising producers who did not make such efforts.

It is possible to implement Individual Responsibility

During transposition of the EU's WEEE Directive, we see that the debate over the preference of individual-versus-collective responsibility with respect to providing incentives to producers to design their products for improved end-of-life processing, although easy to conceptualise, has led to confusion among many actors. It seems that there is a common misunderstanding that individual financial responsibility always implies an individual physical responsibility translating to individual systems for collection and treatment of end-of-life products. This is clearly not the case and there is evidence that individual financial and individual physical responsibility is implemented in some collective systems operating today.

The main idea for pursuing individual responsibility is to provide incentives for producers to strive to enhance the environmental performance of the total life cycle of their products. In light of this objective, and reflecting current practices, the meaning of practical individual responsibility can be expressed as follows: *A producer bears an individual financial responsibility when he/she pays for the end-of-life management of his/her own products.* A producer bears an *individual physical responsibility* when 1) the *distinction* of the products are made at minimum by *brand* and 2) the producer has *control over the fate of their discarded products* with some degree of involvement in the organisation of the downstream operation.

To develop EPR systems that drive design change, it is necessary to understand that only new products can be re-designed. Historical products, that is products that have been put on the market prior to the EPR law, will have to be taken care of, but how the costs are allocated will not directly affect the development of new products. Incentives to change the design of new products come from the possibility of differentiation of fees paid for end-of-life management. The costs of this management will only occur at the time of disposal and can be hard to estimate for complex products such as cars and electrical and electronic equipment. Financial guarantees for future costs are the way to ensure that producers take these costs into account when designing products and product systems. Financial guarantees should not only ensure that there are funds to pay for these end-of-life costs, but also provide flexibility and possibilities for competition on the market, thus allowing market forces to develop efficient solutions.

In addition to these minimum elements of individual responsibility, the current struggle with the transposition of the WEEE Directive and experiences of existing systems for EEE and cars exemplify other key issues that need to be addressed to bring about individual producer responsibility: These issues include: a) identification of all manufacturers and importers and their market shares; and b) distinction between historical and new waste by way of, for instance, marking products/components.

It should be stressed that the distinction of products does not require the physical separate handling of individual producers' products. Existing practice where elements of individual

producer responsibility exist within collective systems, suggests that the distinction of products can be made in various stages of the downstream operation. Timing of product identification includes: (1) the point when the end-user discards products, (2) at product aggregation points and (3) at recovery facilities. All these are currently being practised, which shows the feasibility of practising individual producer responsibility.

Future applications of EPR

Three distinct approaches for considering expanding EPR to more product groups are brought forward in this report. The first two approaches fit into the traditional application of EPR, manifested in take-back and recovery target type programmes, while the third is a more novel application of the EPR principle. The first approach is for a wider uptake of product groups through taking the examples of leading countries that have already developed mandatory EPR programmes for the largest number of product categories, such as Canada and Sweden.

Secondly, given the diverse number of products consumed and disposed of in modern society today, it seems feasible to extend EPR programmes to problematic product groups that have not been targeted before. Furniture, children's toys and construction materials have been among products targeted as potential candidates for EPR programme expansion. Owing to their current design, these product groups will often be difficult to recycle from a material perspective without product redesign to facilitate recycling.

Given the wide definition of the EPR principle as used in this report, the extension of responsibility to producers can be expressed in formats that vary considerably from the traditional applications to date. For example, although it may not be feasible to develop take-back programmes for all products consumed in society, the provision of key information by producers to stakeholders at various life cycle stages including retailers, consumers and end-of-life operators may help to reduce negative environmental impacts. Such information can, for instance, help consumers to make more informed choices of products and assist in the optimal management of products during use and disposal. Additionally, extending producer responsibility to other life cycle phases beyond end-of-life stage may encourage new business approaches that include delivering the products' function rather than the product itself.

Applicability of EPR to non-OECD nations

The wide disparity between wealthier consumers and the poor in non-OECD countries justifies action to ensure the producer and actual consumer, but not the general taxpayer, are responsible for the management of end-of-life products. This makes the introduction of EPR programmes a good policy choice. There are a number of important factors to take into account when considering the applicability of expanding EPR programmes to non-OECD nations.

The inclusion of substance restrictions in products, as considered under the broad definition of the EPR principle, is a highly relevant consideration for any non-OECD nation introducing EPR law. Using the example of electronics, given that material restrictions are in place that are impacting the global electronics sector (namely the RoHS Directive), it would be advisable for any nation implementing EPR law to, as a minimum, enforce the same requirements to avoid becoming a dumping ground for any global excess of components containing these restricted materials. This would also avoid manufacturing equipment that would lock in the use of these restricted materials for a considerable time in the future. Given that a considerable proportion of both EEE manufacturing and re-

use/recycling of WEEE takes place in Asia, the benefits of non-toxic products are realised in both phases of the product life cycle.

What must also be considered is the fact that in many cases, used EEE that is sent from OECD countries may more appropriately be categorised as WEEE, which is considered as hazardous waste under the Basel Convention. Given the Convention's envisaged ban on the export of hazardous waste from OECD to non-OECD countries, the import of WEEE should be banned by non-OECD countries. Imported used EEE which ends its life in non-OECD countries should be adequately addressed in any EPR programme.

Care should be taken that existing recyclers in these countries, often operating with limited access to capital, are given reasonable chances to upgrade their activities and continue to work in the sector when new demands on operations are introduced. Government may have to intervene with both regulation and financing to make possible a smooth transition from today's systems.

The potentially large importation of used products and non-branded new products will clearly need to be addressed to ensure that any EPR programme design is financially sustainable. If the total contribution of end-of-life products from these sources is high, the financial burden would fall on the more recognisable local and international brands. However, the possibility of producers taking individual financial responsibility for their end-of-life products should be provided. Europe has addressed this by requiring a financial guarantee to be provided for all new products put on the market, although there appear to be legal loopholes, which allow for this requirement to be circumvented.

Conclusions

Existing research shows that EPR laws do prompt eco-design changes. The drivers of eco-design are strengthened when there is feedback on the total end-of-life costs to individual producers: namely collection, dismantling, re-use and high-levels of material recycling. Existing EPR programmes for WEEE and ELV show that implementing IPR (individual producer responsibility) is possible.

What is also evident is that for products such as cars and EEE, these changes have to date been more the result of anticipating such regulatory requirements than the actual incentives that are provided when the EPR programme is implemented and in operation. It is worth remembering that most producers during the beginning of EPR discussions viewed EPR as a future demand to manage their own products, that is, what later came to be called 'individual producer responsibility'.

The key lesson from the European WEEE implementation to ensure that IPR can become a reality is the need to level the economic playing-field between various EPR schemes.¹ To do this, the following measures are needed to correct the current distortions which favour collective compliance schemes:

1. True financial guarantees for the costs of future waste
2. Internalising the full costs of end-of-life including collection, which in many countries continues to be subsidised by municipalities

¹ See IIIEE Report "Lost in Transposition – Implementation of Individual Producer Responsibility in the WEEE Directive (2006).

3. Ensuring that the economic signal from treatment and recycling reflects the full costs of high-quality material recycling.

Environmental quality has to be secured through demands of high-quality material recycling and not downcycling, that components and materials are re-used and that the environmental problems are not just exported to countries with insufficient law and even less recycling and waste management infrastructure than in OECD countries.

The application of the EPR principle can be expanded further, both in terms of targeted products and types of instruments used. The use of EPR programmes has been expanded geographically as well. When introducing EPR programmes in non-OECD countries, special consideration should be made of issues such as second-hand and non-brand products, waste disguised as recyclables, existing recyclers and inclusion of substance restrictions.