

Orphan and existing products



4.6.1 Introduction

Three main issues that need to be addressed by any EPR program are “free riders”, “orphan” and “existing” products. Free riders are the actors in an EPR system who do not pay for the benefits they receive. Orphan products are those which are subject to an EPR policy, but whose producer is non-existent due to bankruptcy or other reasons. “Existing” (pre-existing) products are those already on the market at the time the EPR policy is introduced. The ability to deal efficiently with these issues is an important consideration when different EPR programs and alternatives to EPR are analysed.

4.6.2 Free riders

Free riders benefit from the EPR system without contributing an appropriate share of the costs. There is scope for all kinds of participants (consumers, producers, importers, retailers, collectors and recyclers) to free ride one way or another. While there are various ways to reduce free riding, there is usually a trade-off between effectiveness and administrative cost. Achieving zero free riding, even if possible, would probably not be worth the cost.

The extent of the free rider problem depends on the design of the EPR system (policy instrument or mix of instruments selected) and the type of product involved. Take-back systems for products with thousands of producers/importers, for example, have a higher potential for free rider problems than those in more concentrated markets. The scope for free riding is greater and more complicated to deal with when a large number of producers (packaging material manufacturers, brand owners, wholesalers, retailers, etc.) are part of a long production chain.

In other product areas such as photovoltaic industry, electronics or motor oils, where the industry is more concentrated and/or vertically integrated, the number of producers affected by an EPR programme may be considerably smaller. Thus, there will be fewer free riders and the issue can be easier to deal with.

In some cases, the scale of free riding does not threaten the financial viability of an EPR system but does raise equity concerns, as the free riders obtain a competitive advantage. In others, however, even a small amount of free riding can compromise the entire system.

The following are examples of free riding in the context of take-back and recycling schemes:

Producers/importers may under-declare the amount of products they put on the market that should be covered by the EPR scheme, or they may not be registered in the system at all.

Producers/importers may free ride by paying EPR fees in a low-cost jurisdiction and selling their products in a higher-cost one.

Collectors may mix products for which payments have been made within the EPR system with those for which payments have not been made.

Consumers may use a designated collection receptacle provided by the EPR programme to dispose of materials not covered by the programme. The higher the charge for general waste disposal services, the greater the incentive to do so.

Recyclers may illegally dispose of materials they are paid to recycle.

Existing EPR schemes have addressed free-rider problems in various ways. For example, the problem of consumer misuse of designated receptacles has been addressed by the German DSD through changing the incentive structure that applies to waste collectors, and by encouraging peer group pressure. While collectors were previously paid according to the

weight of the materials collected, they are now paid only for the portion of these materials that should have been collected (i.e. which DSD can recycle). This gives collectors an incentive to reject inappropriate materials that have been put out for collection.

Peer group pressure can be expected to play an important role in reducing free-riding by producers. There is an economic incentive to report competitors who cheat the system, to the extent that they can be identified. Reporting and monitoring systems are therefore very important. In theory, government enforcement against free riders would improve compliance, and should be possible both in mandatory EPR programmes and (perhaps to a lesser degree) when requested by participants in voluntary industry-based programmes. As it is impractical to physically monitor the amount of a product that ends up in an EPR collection system, random audits of the quantities placed on the market are an alternative compliance mechanism. In legislated schemes, authorities are likely to require reporting by producers that claim to be meeting their EPR obligations without resorting to a system such as a PRO.

Producers and their PRO's are able to deal with free-riding members by peer pressure, monitoring, self-reporting requirements, sanctions, and even expulsion from the PRO. But such methods are ineffectual against free riders who lurk outside of the EPR regime that applies to them.

When the PRO has done what it can to minimize free-riding, there might be instances where government help may be needed to obtain compliance by PRO non-members and other free riders. In addition to addressing free-riding producers, government (at the municipal level) could consider establishing compliance requirements for consumers whose participation is essential to EPR success. Wide dissemination of program information to consumers could help improve their understanding and increase compliance.

Public disclosure of producers who have been found to cheat the system may be an additional tool to encourage compliance. In addition, the lower the costs of being in the EPR system lowers the incentive to cheat. Finally, for mandatory programs the role of enforcement should help to minimize free riding.

4.6.3 Orphan and existing products

'Orphan' and 'existing' products present challenges for EPR. Orphaned products are those subject to EPR requirements whose producer has disappeared due to bankruptcy or for other reasons. Existing products are those designed and/or introduced on the market before EPR requirements were established.

Existing products were not typically designed with the objectives of EPR in mind and, therefore, they may be more expensive to manage at end-of-life. With orphaned products, there is usually conflict related to who should bear the cost of end-of-life management. These problems, in turn, create concerns about the fairness of the allocation of costs.

The magnitude of these problems depends on the number of pre-existing products (for example in India already 35 GWAC of PV capacity is installed and will increase till the date

EPR is implemented), the cost of end-of-life management, the life span of the product (20+ years for PV), costs to treat orphan and existing products relative to their sales price, and the number of actors involved.

While the issue of existing products is not likely to be significant in the case of fast-moving consumer goods, it is likely to exist to some degree in the case of EPR systems for longer-life durables.

Decisions concerning how to deal with existing products depend on programme objectives. If the objective of an EPR scheme is primarily to encourage future design improvements with respect to end-of-life management, then it may unnecessary to attempt to deal with products already on the market. EPR could apply only to products put on the market after the introduction of the policy. If the over-riding objective is to deal as soon as possible with problems arising from disposal of the products, a decision will need to be made on whom is responsible for products already in the hands of consumers. Allocating responsibility for orphaned products is somewhat less complicated; it is essentially a political decision about who will bear the costs and responsibilities.

Product type and characteristics will affect the way orphan and existing products are addressed. Short life products like packaging and beverage containers would be dealt with differently than longer life products such as photovoltaic modules or white goods.

Different funding mechanisms can create different incentive structures and raise different issues with respect to orphan and existing products. The remainder of this section looks at the different funding mechanisms and their implications. These mechanisms are notably similar to those that can be used to fund EPR programmes for new products.

4.6.3.1 Financing options for addressing orphan and existing products

Advance disposal fees

Under this method, a fee levied on a new product at the point of sale goes towards funding end-of-life management of similar products already at the post-consumer stage. In other words, current receipts finance current expenditures.

This method can be used to address both orphan and existing products if producers ignore the origin of products, which have already reached the post-consumer stage. Regardless of the brand, or the current status of the original producer, the sale of the new product provides funding for managing treatment of the used products.

One drawback is that it may be complicated to establish a direct link between the fee levied on the new product and the cost of dealing with that particular product when it is discarded. The pricing mechanism will therefore not send a signal to the market about the relative costs of end-of-life management for different brands of the same product, and cost internalization will be approximate. This is because the amount of the fee will be determined by current needs related to managing the stock of existing products, not that of future ones.

If authorities set a standard fee, different producers will not be able to compete on the basis of offering cheaper end-of-life management. Individual producers will not be able to offer lower prices on the basis of their lower end-of-life management costs. Economic incentives to improve the product's environmental design and recyclability will therefore be limited. The same situation would exist where a fee at the time of purchase system operated through a PRO that handled recycling and re-use collectively.

Whether this kind of system is administered by a PRO or individual producers, there are likely to be situations in which there is a mismatch between the generation of funding and the pattern of expenditure. Sometimes sales of new products may be relatively high, and the return of used products relatively low, generating a surplus. In other cases the reverse could occur, resulting in a deficit. There is a need to average out and adjust revenues and expenditures over time.

It will also be much easier to gain consumer acceptance of levying a fee on a new product to pay the costs of end-of-life management of existing products where there is a widespread agreement on the need to address the issue of disposing of these products.

Fees paid at the time of purchase

From an economic point of view, it is worth emphasizing that a fee paid at the time of purchase effectively uses the narrow tax base of new sales of a product to fund end-of-life management of products sold earlier. It is also open to governments to use a larger tax base (i.e. to use revenue from general taxation) to fund the same objective. However, where letting products such as new refrigerators and cars bear the cost distorts and depresses sales, the introduction of environmentally preferable technologies or more environmentally compatible products would likely be delayed.

A fee levied upfront for a product's eventual disposal could work in the case of products such as cars, where a system already exists to keep track of transfer and eventual disposal. Where producers take individual responsibility for end-of-life management, including keeping the proceeds of EPR fees to fund future end-of-life management, they will leave orphan products behind if they go out of business. Both the physical and financial responsibility for dealing with the orphan products would need to be assigned to the remaining producers or in some cases, the local authorities.

An EPR system needs to allow some tracing of "disappearing" companies, so that a simple name change, for example, is not sufficient to evade paying for end-of-life product management. That is, passing costs onto others too easily should not encourage the creation of orphan products.

Where fees are pooled at the industry level through a PRO, trust fund or government body, advance deposits are not lost when a company goes bankrupt or otherwise disappears. Nevertheless, the problem of averaging out the timing of receipts and expenditures remains, as does that of funding an eventual deficit.

The last owner pays

Rather than paying at the time of purchase, an EPR programme could mandate take-back and levy the fee for end-of-life management on the consumer when a product was returned to the retailer/manufacturer. This financing mechanism can address orphan products if remaining producers or a PRO agree to take back brands that no longer have a parent company. Additionally, affixed fee schedules at the time of purchase would inform the consumer of the actual fee they would pay at the end of life disposal at the point of sale. For example, when a consumer purchases a refrigerator, they would be informed of the actual fee that must be paid and their responsibility at the post-consumer stage.

It should be noted that having to pay a fee might deter consumers from returning products, which would increase illegal dumping or use of landfills. The likelihood of this happening depends on consumers' sense of responsibility, the level of fines (and level of regulation against placing waste in normal trash receptacles) for illegal dumping or landfill use, and the ease and cost of returning the used products. Regulatory action might be warranted to avoid illegal disposal of products and deter free riding of consumers by leaving products by the side of the road or illegally placing products in the municipal waste system. Moreover, consumer convenience will be an important determinant of the programme if the fee naturally prompts proper action by the last owner.

Insurance

One way to deal with the orphan product problem could be to take out insurance against the possibility of an underfunded end-of-life management liability. This could be envisaged where a PRO has collective industry-wide responsibility and is funded by payments from producers at the time their products are purchased. The PRO or a government authority could perhaps insure against the risk of having to pay for orphan products where a parent company had not contributed to the costs of EPR.

Alternatively, producers could be required to post a bond covering the cost of end-of-life management of products still on the market. The complicating factor here is that the consumer, rather than the producer, decides when products are at the end of their useful life. It would therefore be difficult to manage the terms of the bond and the pay-out stream.

Phase-in

If there are serious concerns about the fairness of levying fees on new products to pay for end-of-life management of existing products, and advance disposal fees are not considered viable, another option is to phase in EPR and associated costs to consumers gradually. For example, the proportion of existing products assigned to manufacturer end-of-life financing would increase over time.

Another option would be to announce a date when the EPR programme would become effective. This approach would be more suitable when the policy objective was concerned with influencing new product design rather than with disposal of existing products. Giving significant lead-time to the implementation of an EPR programme allows time for existing products to be

handled in the traditional “pre-EPR” way, thus avoiding a situation in which new sales include the costs of handling existing products. Using such an approach, the amount of notice given would be significantly influenced by the probable lifetime of the product in question.

4.7. Costs

4.7.1 Introduction

Defining costs that should be covered by EPR is a relevant issue. Most EPR schemes clearly cover partly or fully the net costs for the management of waste that has been separately collected (e.g. costs for collection and treatment, minus revenues from the sales of recovered materials), as well as administrative, reporting and communication costs relative to the operation of collective schemes.

‘Full-costs’ theoretically include (in addition to those aforementioned):

▶ Collection, transport and treatment costs for non-separately collected waste (waste covered by EPR but not entering the separate collection channel, e.g. waste collected together with mixed municipal or industrial waste);

▶ Costs for public information and awareness raising (in addition to a PRO’s own communication initiatives), to ensure participation of consumers and final owners of the discarding products (waste) within the scheme (i.e. through separate collection);

▶ Costs related to waste prevention actions;

▶ Costs for litter prevention and management;

▶ Costs related to the enforcement and surveillance of the EPR system (including, auditing, measures against free riders, etc.).

In addition, for those costs explicitly covered by the EPR system, the level of coverage (full or partial) by the producers varies. This level of coverage is closely linked to the share of responsibilities between stakeholders (see also Section 3 above).

4.7.2 Costs

The costs within an EPR-environment are usually divided into two big chapters: administration (overhead) and operations whereby the overhead costs are relatively stable and the operations costs might fluctuate depending on the amount of collected waste versus the costs for treatment and the negative or positive prices of the recovered materials.

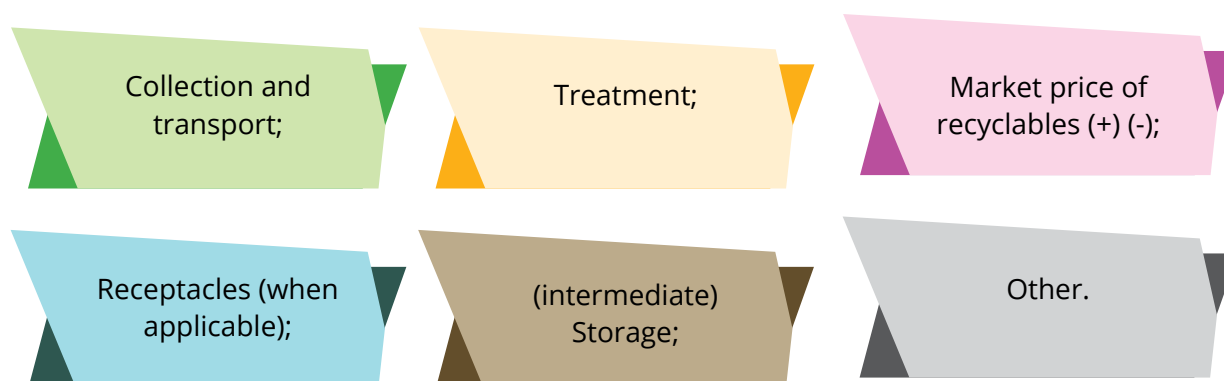
Administration costs

The administrative costs consist mainly of the following ledgers and might differ a bit when the EPR is more focused on household waste or industrial waste:

- ⦿ Costs for Data management and reporting from Producers to the PRO and from the PRO to the public authorities;
- ⦿ Costs for public information and awareness raising (usually when households needs to be reached);
- ⦿ Marketing and Communication costs;
- ⦿ Costs related to waste prevention actions (more for one-way and fast-consuming products than for long life products such as photovoltaic modules);
- ⦿ Costs for litter prevention and management (usually within household waste);
- ⦿ Costs related to the enforcement and surveillance of the EPR system (including, auditing on the POM (Put-On-the-Market data) and on the treatment performance of waste treatment plants, measures against free riders, feasibility studies, etc.);
- ⦿ Staff costs;
- ⦿ Office costs;
- ⦿ Financial costs (banking, interests, financial auditing, etc);
- ⦿ Legal advice and support;

Operations costs

The operations costs consist mainly of the following ledgers and might differ a bit when the EPR is more focused on household waste or industrial waste:



In most of the cases, net operational costs (i.e. collection, transportation and treatment costs) for the management of separately collected waste are covered by the EPR system.

The extent to which net operational costs are assumed by PRO's (and therefore covered by producers' fees) is highly variable and depends notably on the share of organizational and financial responsibilities of the various stakeholders, as well as on the national framework for EPR.

For example, in most cases for battery waste, the financial responsibility assumed by battery producers covers 100% of collection and treatment costs.

For WEEE, PRO's can cover 100% of transportation (pick-up from public amenity centres) and treatment costs. However, in a number of cases, PROs also cover 100% of the collection costs, through reimbursement to local public authorities.

For some streams, operations are self-financed. This means that revenues from the recycling materials' sales fully cover the costs for collection, transport and treatment. In these cases, producers' fees (if any) are mainly used to fund data management, auditing activities, communication efforts and administrative costs (staff etc). This applies commonly to End-of-Life Vehicles and waste oils and for some flows of electronic waste. However, the situation may also vary from one country to another.

Photovoltaic modules versus costs and revenues under EPR

For photovoltaic module²⁶, the administrative costs shall be similar as in each EPR-environment. The challenge is the operational costs where – the good and bad news – almost no waste occurs whilst the fixed administrative costs exist.

The long lifetime of these products is a huge contribution to the prevention of waste and thus to the delay of costs whilst at the other hand the very low amounts of discarded photovoltaic modules result today easily in a spread of the costs by 90% administrative costs versus 10% operations costs. Within 20 years, this spread will change into relatively low administrative costs versus the amount of operations costs.

On the other hand, the volatile solar market is a risk factor within EPR.

Therefore, the creation of provisions or funding for future waste management is crucial in order to be able as solar industry to manage the upcoming waste environmentally sound in the (near) future.

A draft financing model for an Advanced and Visible Disposal Fee is therefore very recommendable.

²⁶As stated in the introduction to this Chapter, this section explores EPR costs of PV modules only. Other products within a PV system such as inverters and batteries can easily be added to the programme, since these are attractive products in the waste phase due to the value of the materials in these products, whereas the value of end-of-life PV modules is lower as they are mainly composed of glass.

4.8. Recommendations

The following list contains key recommendations for policymakers. While these recommendations are applicable to all government interventions, they are based on experience with the design and implementation of mandatory and voluntary EPR policy approaches for PV modules in several European countries.

1. Set up a five-year Management plan.

The PV industry shall introduce a five-year Management plan which defines the strategical vision and, which contains at least with the following main features:

- ⊙ A forecast of the amount of collectable used PV modules;
- ⊙ Measures about prevention (prevention plan);
- ⊙ The strategy related to information campaigns (communication plan);
- ⊙ The actions towards the owners, the installers and wholesales companies related to collection, reuse and treatment of used PV modules (sensitize plan);
- ⊙ A five-year financial plan;
- ⊙ A plan containing the provisions spread over 35 years which is annually monitored and – when required – updated;
- ⊙ A method, which allows to follow-up the collected and treated used PV modules, including annual reporting;
- ⊙ The actions related to the collection of PV modules;
- ⊙ The actions related to the treatment of PV modules.

2. Do not set any collection target in the first phase of the EPR system.

The first 35 GW in India is from very recent date whilst the lifetime of PV modules is easily 20+ years and PV modules are an investment product instead of a consumer product. Once the first five-year Management Plan is expired, the PV industry and the policy makers can foresee for example a “waste generated” target based upon the installed amounts and the experience in collection of the past 5 years.

3. Set clear, realistic and appropriate treatment targets.

Treatment targets shall be appropriately described in the five-year Management Plan. They should be ambitious, yet realistic based on the analysis of the current context. As for the treatment targets, the following values are recommended:

Recovery²⁷: 70% (of which)

Preparation for reuse and Recycling: 55%

The treatment of discarded PV modules must lead to achieve the following – tentative – percentages with regard to the preparation for reuse, and recycling of components and materials:



The targets established need to be transparent and acceptable to all stakeholders (industry, consumers, environmental citizens' organizations, consumers, public interest groups and others.

Periodically review the targets of EPR policies and adjust their ambition in line with waste management and resource policy objectives; take account of the costs and benefits of proposed targets and establish them in consultation with stakeholders.

4. There is no single "right" approach.

There is a continuum of EPR approaches from voluntary (industry-based initiatives, such as PV CYCLE from 2008-2013) to mandatory (such as PV CYCLE as from 2014). The approach used depends on differences in products, market structure, targets, prices of secondary materials and other factors.

5. The visible fee approach seems the best fit to the Indian context.

There are two financing options:

a) Internalization of waste management costs

Today, there is no clear evidence of a strong positive impact of internalizing the management costs in the sales price of PV modules. A PV module is relatively new product and thus the industry is still in a full swing of producing more efficient PV modules whilst at the same time the very long lifetime of these products allows these to add a huge value in preventing waste for 20+ years.

The manufacturer can have the largest influence on product design. However, the manufacturer shifted the past ten years from manufacturers around the globe to currently 90% of the manufactured PV modules are produced in Asia.

²⁷"Recovery" is a legal term in the waste law and means "preparation for reuse, recycling and energy recovery".

b) Visible fee

The visible fee approach drastically limits the free riders, saves the cash of the Producers/ Importers – the economy drivers – and put the financial responsibility on at the Polluter (Pays) whilst the legal responsibility is and remains at the Producer/Importer.

For a PV module, starting with a visible fee approach is the best way to start an EPR-program in India because:

- ⦿ Avoiding Free riders: during the first 5 years in India, it is much more important to focus on a market where all producers and importers are compliant with the EPR regulations;
- ⦿ It is a powerful mechanism to create a level playing field and at the same time to build a reasonable Fund for future waste management for a product with a very long lifetime of 20+ years;
- ⦿ The manufacturing of PV modules is mainly done outside India and the manufacturers producing their products for a global market where currently no Ecodesign requirements exist for PV modules.
- ⦿ There is no country nor a region in the world which has an existing Ecodesign framework in place for PV modules; even for other products the Ecodesign or Design for recycling requirements only exist on paper and have no proven record; even the European Union strives to have its Ecodesign requirements for PV modules implemented only by the earliest in 2024;

6. Ensure neutrality to competition.

The framework of the EPR program should be designed to have as neutral effect as possible on competition.

- A. In general, more competitive markets for collection, recovery and re-use of products will yield lower costs and higher production of these services. It is important to avoid creating monopoly or monopsony power through regulatory barriers to entry in post-consumer materials markets. However, this can be easily organized when the PRO invites the complete downstream market to bid for logistics, treatment and other supplies the PRO requests – see also F.
- B. EPR policies create a powerful incentive for companies to co-operate to jointly meet the individual responsibilities. Policymakers should seek to eliminate artificial regulatory barriers to efficient co-operation, including regulatory provisions that seek to dictate particular forms of co-operation.
- C. Where possible, competition authorities should be included in the EPR policy-making process to provide advice on the likely impact on competition and consumers of alternative EPR approaches. Competition authorities should carefully examine the extent to which co-operation is necessary for EPR purposes and should focus their