



## Extended Producer Responsibility (EPR) for Managing Packaging Waste

October 2018

INVOLVING ALL STAKEHOLDERS ALONG PACKAGING  
VALUE CHAINS TO REDUCE PLASTIC POLLUTION  
AND ENHANCE RESOURCE EFFICIENCY

**EPR systems for packaging are an established environmental policy instrument, contributing to preventing negative impacts from plastic waste in the environment.** EPR mechanisms for packaging emerged in the late 1980s and have since been implemented in most European Union member states as well as in some other countries. EPR is also a potential approach for developing and emerging economies, which face increasing amounts of packaging waste and are preparing measures to prevent marine litter and other forms of environmental plastic pollution. Every year, 5-13 million tonnes of plastic waste end up in the ocean<sup>1</sup> and plastics production continues to grow rapidly. Approaches to better reduce, collect and recycle plastic packaging waste are therefore urgently needed.

**Extended Producer Responsibility (EPR) involves producers in the management and financing of packaging waste.**<sup>2</sup> It is based on the polluter pays principle, making companies that put packaged products on the market responsible for the packaging throughout its whole lifecycle, including waste management. It can

contribute to effectively financing and organising appropriate collection and treatment infrastructure, especially in contexts where covering operating costs of waste management services is often a challenge for governments and municipalities.

**Experience in Europe shows that EPR systems can significantly contribute to job creation.** For instance in Germany, around 290.000 people meanwhile work in the waste management and secondary raw materials sector (not only packaging) with around 15.800 facilities and 10.800 companies, generating a turnover of 76 billion € per year.<sup>3</sup> In many developing and emerging economies, informal waste pickers and entrepreneurs play a central role in collecting certain types of packaging waste. Opportunities exist to integrate informal sector workers into improved collection and sorting of packaging waste, thereby enhancing their income and working conditions and enabling long-term sustainability of the system. Extended producer responsibility for circular economy implemented in an inclusive way is therefore beneficial for people, planet and prosperity.

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**The basic principles of EPR are the same in almost every country:**

- » Every obliged company pays a fee when it puts a packaged good on the market.
- » The fee serves for the collection and further handling of the packaging waste.

- » Ensuring the collection, sorting, recycling or energy recovery of packaging waste remains in the responsibility of the obliged companies.

Other approaches exist, such as environmental taxes or import duties on raw materials and goods. In these cases, most of the funds usually flow into the general public budget, so there is no producer responsibility in the sense of an EPR system.

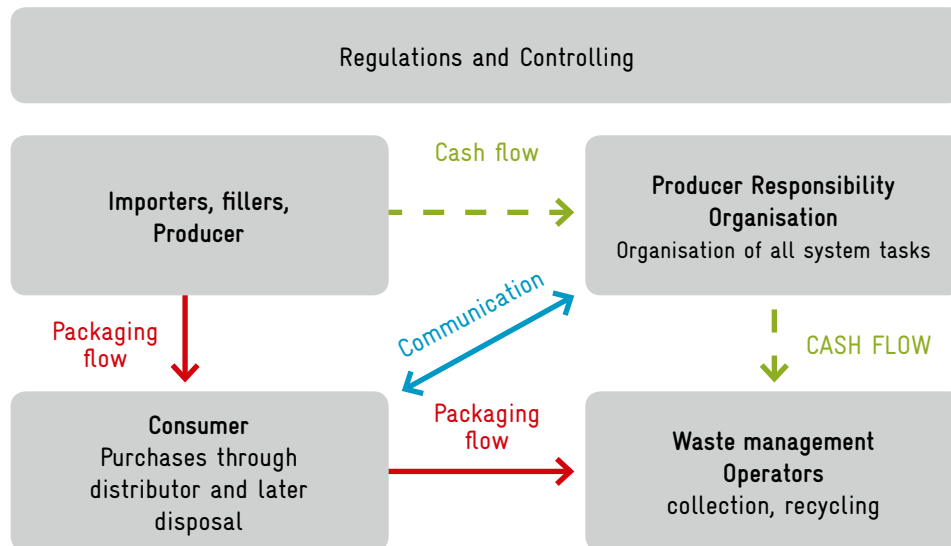


FIGURE 1: The general principle of an EPR system

**1) Creating a policy and legal framework for EPR**

**Public policy plays a crucial role in providing a legal framework for establishing EPR systems.** Establishing a legal framework for EPR usually takes place at national level, but may also take place at the provincial or local level. It forms a part of the legal framework for waste management, and often the Ministry of Environment therefore takes a leading role. The policy defines the responsibility of individual companies to either organise the take back and management of packaging waste on their own (individual responsibility), or to join and pay financial contributions to a larger packaging waste management system with several other companies (collective responsibility). A prerequisite is that the amount of packaging put on the market by each company can be precisely measured. Generally, packaging waste collections by individual companies or other stakeholders can also be established without elaborating a law. They are however defined as voluntary take-back systems rather than as EPR systems.

**The legal framework for an EPR system should address:**

- » which companies are legally obliged to take on responsibility
- » who is responsible for financing and organising the system
- » who registers all legally obliged companies
- » which packaging types should be included in the system
- » what the requirements and quotas for collection and recycling are
- » what the role of the municipalities is
- » how the informal sector can be integrated
- » what kind of public supervision is required and how this can be organised

**Legal foundations for an EPR system can be laid down in an environmental protection law, a specific packaging law or a packaging ordinance – depending on the respective legal context.** To ensure successful implementation, the process to elaborate the legislation should involve all key stakeholders from the public and private sector as well as from civil society. The elaboration process should aim to ensure the EPR system can be practically implemented, as well as being sustainable from an economic, environmental and social perspective. The legal framework should outline clear objectives, responsibilities, enforcement mechanisms and a timeline for implementation. It should also include the framework for setting-up a Producer Responsibility Organisation (e.g. non-profit vs. profit system, full cost coverage vs. subsidies from the public budget).

**Many countries have adopted mandatory packaging recycling targets.** Mandatory targets are an important driver for increasing material recycling of packaging waste within EPR systems, rather than sending waste to co-processing in cement plants, incineration, mostly for energy recovery, or landfilling. For instance, in May 2018 the European Union amended its Directive on packaging and packaging waste with the requirement for its member states to achieve a material recycling rate for all packaging of 65% by 2025 and of 70% by 2030.<sup>4</sup> Furthermore, it specifies minimum recycling targets by weight for individual packaging waste materials. E.g. in Germany, the targets of this EU Directive are transferred into national legislation by a specific packaging law, which enters into force in January 2019. This new packaging law also updates the principles of the German EPR system, which had originally been introduced by a packaging ordinance in 1991 and the voluntary foundation of a Producer Responsibility Organisation by the private sector in 1990.

TABLE 1: EU packaging recycling targets

Material contained in packaging	2025	2030
Plastic	50%	55%
Wood	25%	30%
Ferrous metals	70%	80%
Aluminium	50%	60%
Glass	70%	75%
Paper and cardboard	75%	85%

**To achieve such recycling targets, infrastructure for the collection, sorting and recycling of packaging materials is required.** Such infrastructure development is facilitated by the establishment of EPR systems to guarantee financial coverage of operating costs and regular access to sorted material volumes as well as creating a favourable investment environment for businesses.

## 2) Establishing a Producer Responsibility Organisation (PRO)

**It is usually more cost-efficient for individual companies to combine their efforts and manage packaging waste together in a collective responsibility.** For this purpose, companies found a Producer Responsibility Organisation (PRO) that assumes responsibility for the take-back of packaging they put on the market. Joining forces reduces transaction costs for each company and facilitates the management of packaging waste for consumers. The PRO is accountable for fulfilling all its tasks and for spending the funds paid by the obliged companies accordingly. A public agency is responsible for supervising the PRO in this regard.

### In well-functioning EPR systems, the PRO executes the following tasks:

- » register all obliged companies that have to pay for the services of the system
- » collect and administer the funds from the obliged companies
- » tender and contract waste management operators for collecting and recycling packaging waste, including informal sector integration
- » document the collection, sorting and recycling of packaging waste
- » inform citizens and other waste producers about separate collection of packaging
- » supervise the services conducted by service providers, in particular the collection and recycling done by waste management operators
- » document and give proof to the public supervisory authorities

**The implemented PRO models vary between countries.** Generally, it is possible that a public agency assumes the organisation and financial administration of the system. Usually, the EPR system is however organised by a non-profit organisation or a for-profit corporation, which is only supervised and not managed by public institutions. In any case, effective and efficient organisation, financing, administration and controlling of the system are determining factors for the success of the EPR system. Examples of PRO models are:

» **PRO as non-profit organisation:** Such PROs are in the hands of the obliged producers and industry. They exist e.g. in Belgium, France, Italy, the Netherlands and Spain. In these countries, the municipality is responsible for waste collection while the PRO transfers funds for the collection directly to the municipalities. In Belgium and the Netherlands, the respective PRO is responsible for all kinds of packaging waste. In some other countries, PROs are only responsible for packaging waste produced in households.

» **PRO as for-profit corporation:** The legal framework can require direct competition between several PROs instead of having a single monopolistic PRO. Such a model exists e.g. in Germany and Austria where the EPR systems have evolved from having a single PRO to competition between several PROs. Since the PROs are private companies, they are not in the hands of the obliged industry but each obliged company has to contract a PRO of their choice for the management of their packaging. Furthermore, in Germany and Austria the EPR system exists in parallel to municipal waste management and municipalities are not part of the EPR system.

### 3) Defining the roles & responsibilities of stakeholders along packaging value chains: Who is the "producer"?

**Defining roles and responsibilities of stakeholders along packaging value chains is essential.** Materials and packaging manufacturers, consumer goods companies (filling or packaging their products), packaged goods importers, retailers and distributors, and consumers are all to a certain extent responsible for packaging waste.

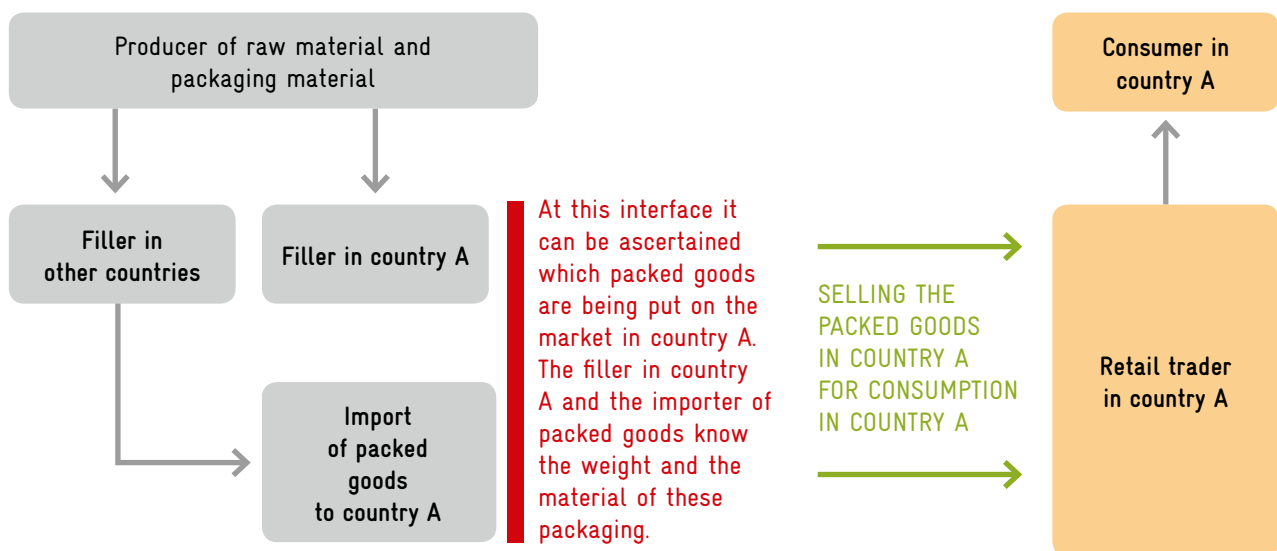


Figure 2: Stakeholders in the supply chain<sup>5</sup>



**Manufacturers of materials and manufacturers of packaging are at the beginning of the value chain.**

They use raw materials from resource extraction or secondary raw materials from recycling to produce packaging materials and final packaging. Often, packaging consists of complex combinations of various materials. Packaging manufacturers influence through their design and production processes whether packaging is reusable, recyclable or compostable, and free of hazardous substances. As packaging itself is usually not purchased (except e.g. plastic bags) but filled with food, beverages and other goods and may be exported to other countries, it is difficult to define them as obliged companies for fee payments to the EPR system.

**Consumer goods companies play a central role as “producers”.** They put packaged goods on the market of a specific country or region by selling imported products or locally produced goods in packaging to retailers. At this sales-interface, it is easiest to clearly identify companies for fee payments to the PRO. Financing of EPR systems is successful in countries where the interface for a clear identification of the obliged companies is precisely defined. As a result, free riders (those who put packaging on the market but do not pay into the EPR system) and double payments can be avoided. These obliged companies know how much packaging will eventually become

waste in a particular country or region. It is therefore possible to determine how much the filler or importer has to pay to the PRO for the proportionate waste collection and treatment according to the quantity and material fraction of the packaging they put on the market.

**The companies obliged for financing have a high interest in ensuring an optimal design of the EPR system.** They therefore have an incentive to become member of a PRO or participate in its creation. Non-obliged companies such as packaging designers or manufacturers of raw materials can also be included in the PRO. Furthermore, legal provisions can help in ensuring sufficiently high payments to the PRO to ensure appropriate waste management services and in clarifying the relation to municipalities.

**Retailers and consumers are also key stakeholders.** Supermarkets and stores represent the interface between the private sector and end consumers of packaged products. In many EPR systems, retailers also have take-back obligations for packaging, e.g. by providing separate bins for glass, paper, plastics and other material fractions. Furthermore, they need to contribute to informing their customers about environmentally sound packaging waste handling. End consumers in turn have the obligation to return packaging to collection systems.

TABLE 2: Roles of stakeholders along the packaging value chain

Stakeholder	Role
1. Manufacturers of materials for packaging and manufacturers of packaging	<i>Not obliged to pay fees to the EPR system</i> but should use secondary raw materials, enable reuse, ensure recyclability of packaging materials and avoid hazardous substances.
2. Consumer goods companies (fillers & importers)	<i>Obliged to pay fees to the EPR system</i> for packaged goods they put on the market within a country. They should establish a PRO and promote reduction, reuse and recycling.
3. Distributors / retailers of packaged goods	<i>Not obliged to pay fees to the EPR system</i> but can be obliged to take packaging back and to ensure its recycling/ energy recovery/ landfilling.
4. Consumers	<i>Not obliged to pay fees to the EPR system</i> but usually cover its costs, as additional costs are passed on to consumers through product prices. They should be informed about strategies for waste reduction and environmentally sound return/ disposal of packaging.
5. Waste management operators	<i>Receive funds from the EPR system</i> for their services to ensure packaging waste collection and recycling / energy recovery / landfilling.
6. Public institutions	<i>Legislation &amp; supervision of the EPR system</i>



Waste in canal in Sidoarjo, Indonesia

#### 4) Organising packaging waste collection and treatment through EPR systems

**Different operator models exist for collecting packaging waste through EPR systems.** They differ in regards to the range of collected packaging types (plastics, glass, aluminium, cardboard, etc.) as well as the choice between drop-off systems (collection from households, specific bins at public locations, return possibilities at retailers). They also vary in terms of separate or mixed collection of the individual material fractions. Figure 3 shows which packaging waste fractions are collected in five different European countries from household waste and waste similar to household waste (e.g. from restaurants, cafeterias, offices).

**In most countries, municipalities are directly involved in the operative business of the EPR system.** This includes collection services provided by municipalities for which the PRO pays the arising costs. Cost coverage by the PRO can also involve the transport of collected waste to sorting or recycling plants. However, there are also examples where the municipality has to cover a part of such costs, e.g. in France where municipalities pay 20% of the collection costs.

**Alternatively, in the Netherlands a model is used where the municipalities have the entire responsibility for collection, sorting and recycling of packaging waste.** In this case, the packaging waste is either separately collected or separated after the collection of waste. This system is financed by the PRO upon record of the amounts of recycled packaging waste provided by the municipality.

**Another model for collecting packaging waste is to contract waste management companies.** E.g. in Austria, Belgium and Germany, the PROs issue a call for tenders for the collection services of packaging waste and select amongst competing companies. However, such a collection system needs to be coordinated with the respective municipalities. Thus, there might be different collection systems across the municipalities in these countries.

## GERMANY

Collection of all lightweight packaging (stable & flexible plastics and metals and their respective composites, liquid beverage cartons). Pilot projects with recycling bins for collecting packaging and non-packaging items of identical material. Separate collection of paper/cardboard and glass. Each year, about 2.4 million tonnes of lightweight packaging, about 2 million tonnes of paper/cardboard and more than 2 million tonnes of glass are collected via the EPR system.<sup>6</sup>

## BELGIUM

Collection of plastic bottles, metal containers and liquid beverage cartons at household level or close to households in drop-off systems. Separate collection of paper/cardboard and glass. Collection of all lightweight packaging is planned for 2022 onwards. The PRO recycles annually approx. 90 % of all packaging put on the Belgian market and has created by now 2,500 jobs.<sup>7</sup>

## FRANCE

Collection of plastic bottles and metals at household level or close to households in drop-off systems; in some cases also composites or soft or other plastics, liquid beverage cartons. Separate collection of paper/cardboard and glass. Collection of all lightweight packaging is planned for 2022 onwards. By now, the PRO has managed to gather 9.5 million € for the collection, sorting and recycling of packaging waste and eventually recycled 56 million tonnes of packaging waste.<sup>8</sup>

## SPAIN

Collection of plastic packaging, metal packaging and composites at drop off stations close to households. Separate collection of paper/cardboard and glass. Since 1998, the PRO has managed to recycle a total of 19.3 million tonnes of packaging and has generated 42,600 jobs in Spain, over 9,400 of them direct.<sup>9</sup>

## NETHERLANDS

Either separate collection of plastics, metals and liquid beverage cartons (since 2015), or collection together with reusable material via the residual waste and post-separation afterwards. Separate collection of paper/cardboard and glass.

Figure 3: Overview of packaging types collected and recovered by EPR systems

### 5) Calculating costs and fees for participating companies in the EPR system

**The costs of an EPR system depend on several factors.**

Such factors include the type of collection system, the waste composition, organisational structures, contractual constellations, financial contributions of the municipalities, recycling quotas, recovery and disposal infrastructure, the existence of deposit-refund systems as well as the distribution of costs across different material fractions. All these factors influence the total costs that the EPR system needs to cover. Table 3 lists some examples of the costs a company has to pay per tonne of packaging waste for different material fractions in the respective country where they put packaging on the market. These costs are however only comparable to a limited extent.



Baled packaging waste



TABLE 3: Costs for participating in the EPR system in 2018 per tonne of packaging waste; \* Non-recyclable plastics are charged with a 50% malus (fee) compared to recyclable plastics \*\* An additional unit factor is additionally charged

Packaging type	Belgium <sup>10</sup>	France <sup>11</sup>	Netherlands <sup>12</sup>	Spain <sup>13</sup>
Paper packaging	25.30 €	163.00 €	22 €	68 €
Glass	27.30 €	14.20 €	56 €	21.20 € **
Beverage cartons	316.40 €	247.40 €	180 €	323 €
Plastic bottles	327.50 €	312.30 €	-	-
All (other) plastics	316.10 €	312.30 €	640 €	472 €
Non-recyclable plastics	-	624.60 €	-	-

Since there are nine different PROs in Germany for packaging waste, PROs do not publish the fees for the EPR contributions. They negotiate them individually with participating companies. It is estimated that the fee for plastics is around 520 € per tonne and for beverage cartons around 450 € per tonne in Germany.

**EPR systems usually include some modulation by charging different fees for different packaging materials and sometimes also for the level of recyclability.** France and Italy were the first to introduce a modulation of their fees based on the degree of recyclability of packaging. Thus, the fee for plastic packaging is doubled in France if they are not recyclable, while in Italy non-recyclable packaging results in different surcharges, amounting to up to a quarter of the original fee.

**A continuous challenge consists however in the lack of internationally agreed and compulsory criteria for assessing whether a packaging is recyclable or not.** In France, the degree of recyclability is assessed based upon the size and composition of packaging. In Germany, a new packaging law requires PROs to establish incentives fostering the usage of material and material combinations during manufacturing that enable the highest recycling content possible in regards to the conventional practice of sorting and recycling.<sup>14</sup>

## 6) Increasing packaging waste recycling through EPR systems

**Recyclability of packaging waste depends on design and available recycling technologies.** First, packaging needs to be designed in a way that makes recycling possible. Used materials and sometimes complex material combinations need to be suitable for closed-loop material cycles in an environmentally, socially and economically viable manner. Secondly, packaging is only truly recyclable if separate packaging waste collection as well as appropriate sorting and recycling infrastructure exist.<sup>15</sup> Mixed collection of municipal solid waste makes recycling more difficult due to contamination with organic material and other substances. Consumer goods companies influence recyclable packaging design through their procurement and contribute to waste collection, sorting and recycling infrastructure through participating in EPR systems.

**EPR systems in the European Union have increased separate collection and recycling of packaging waste.** For instance in Germany, recycling rates increased rapidly during the first 10 years following the introduction of a packaging ordinance and the establishment of a PRO in 1990/1991 as Table 4 indicates. Also in other European countries, separate collection and recycling have increased during the last two decades. Table 5 shows the amount and recycling rates of total packaging and plastic packaging in some European countries for 2016.



TABLE 4: Material recycling rate of different types of total packaging waste generation in Germany (Source: GVM)<sup>16</sup>

Germany	1991	1995	2000
Plastics	11.7 %	37.1 %	52.7 %
Paper	56.0 %	81.5 %	89.6 %
Glass	56.1 %	77.0 %	83.7 %
Aluminium	17.7 %	56.6 %	75.7 %
Tinplate	37.1 %	66.5 %	75.1 %



Packaging waste collection bag in Germany

TABLE 5: Amount and recycling rates of total packaging and plastic packaging in European countries for 2016 (Source: Eurostat).<sup>17</sup> \* Norway is not a member of the European Union. \*\* Recovery includes material recycling & energy recovery – not landfilling.

	EU 28	Croatia	France	Germany	Italy	UK	Norway*
<b>Packaging waste generation (million tonnes)</b>	86.7	0.2	12.7	18.1	12.7	11.5	0.8
<b>Packaging waste generation (kg per capita)</b>	170 kg	55 kg	190 kg	221 kg	210 kg	175 kg	152 kg
<b>Packaging recycling rate (%)</b>	67 %	54.7 %	66 %	70.7 %	66.9 %	64.7 %	57.2 %
<b>Packaging recovery rate (%) **</b>	80.2 %	54.7 %	75.6 %	97.2 %	78 %	71.4 %	96.4 %
<b>Plastic packaging waste generation (million tonnes)</b>	16.3	0.05	2.2	3.1	2.2	2.3	0.2
<b>Plastic packaging waste generation (kg per capita)</b>	31.9 kg	13.1 kg	32.6 kg	37.6 kg	36.5 kg	34.5 kg	39.4 kg
<b>Plastic packaging recycling rate (%)</b>	42.4 %	41.1 %	25.8 %	48.4 %	42.4 %	44.9 %	44.6 %
<b>Plastic packaging recovery rate (%) **</b>	74.2 %	41.1 %	64.5 %	99.8 %	83.9 %	58.5 %	99.3 %

**Further improvements in EPR systems are however necessary.** Packaging waste generation, including plastics, continues to grow in European countries. Additional efforts to minimize waste generation are therefore required, e.g. through reusable packaging instead of single-use packaging. Furthermore, EPR systems have not yet been sufficiently successful in promoting the design of recyclable packaging. Waste incineration has been a common alternative to recycling, as it can be used to recover energy from packaging. However, in terms of respecting the waste treatment hierarchy, enhancing resource efficiency and mitigating climate change, material recycling of packaging is a better option.

**Design for recyclability is gaining momentum.** The European Commission’s “Strategy for Plastics in a Circular Economy” of January 2018 outlines several approaches to make all packaging by 2030 reusable or economically recyclable. These approaches include creating incentives for increasing the demand for recycled plastics, as well as developing guidance for the “eco-modulation” of fees paid to EPR systems, as recently introduced in Italy, France and Germany. Furthermore, the European Commission has proposed in May 2018 a new “Directive on the reduction of the impact of certain plastic products on the environment”. It includes the proposal to ban the placing on the market of certain single-use plastic products such as cutlery, plates, straws, cotton bud sticks, beverage stirrers and sticks attached to balloons. It also suggests to establish EPR mechanisms for food containers (e.g. take-away boxes), packets and wrappers, beverage containers, cups for beverages, tobacco products with filters, wet wipes, balloons and lightweight plastic carrier bags.





Market stand in Bandung, Indonesia

## Outlook

**A next step forward could consist of setting up legislation and Producer Responsibility Organisations within individual countries.** It would require a joint effort of all stakeholders along the packaging value chain. Public policy and legislation could spur the establishment of EPR systems for packaging by elaborating a legal framework that clearly defines roles and responsibilities and identifies those companies who are obliged to pay fees to the PRO. Such policy efforts could contribute to coordinated action by private sector stakeholders through creating an equal playing field and avoiding free-riding of

individual companies. Private sector efforts for packaging waste management could achieve a higher level of effectiveness through coordinated action. Several multinational consumer goods companies have communicated voluntary recycling targets and actively participate in voluntary initiatives at national and international level. Through their operations in Europe, they also have experiences with EPR systems and deposit-refund systems which could be used to set up successful systems in different regions.

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The GIZ Advisory project "Concepts for sustainable waste management and circular economy" provides guidance papers, conferences, trainings and policy advice on resource efficient and climate friendly waste management in cities of low- and middle-income countries. On behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ), it advises on marine litter prevention, the sustainable management of waste of electrical and electronic equipment and climate change mitigation in the waste sector through circular economy approaches.

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