Cover Image: Ezra Acayan, on assignment for Break Free From Plastic

EXTENDED PRODUCER RESPONSIBILITY

COMPATIBLE WITH PLANETARY BOUNDARIES

FOR AN EFFECTIVE EPR WHICH DELIVERS ON WASTE PREVENTION , REUSE, REDESIGN, SAFE AND SUSTAINABLE WASTE MANAGEMENT AND JUST TRANSITION

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Zero Waste Europe

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#BreakFreeFromPlastic

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1. EXECUTIVE SUMMARY

Extended Producer Responsibility (EPR) has emerged as a key policy tool for managing waste and implementing the polluter pays principle. However, after decades of implementation, EPR systems have shown mixed results in reducing environmental impact and advancing circular economy principles.

This study critically examines the performance of EPR systems worldwide, focusing on their effectiveness in waste reduction, reuse promotion, and ensuring a just transition for waste workers. Key findings include:

1. While EPR has successfully mobilised resources for waste management, it has not led to a reduction in waste generation. In many cases, waste volumes and absolute environmental impact have increased despite EPR implementation.

2. EPR systems have generally improved collection and recycling rates in those places where legislation has provided the right guidance, but have struggled to promote waste prevention and reuse or discourage waste disposal (landfilling or waste burning technologies).

3. The implementation of EPR in the Global South faces unique challenges, particularly in ensuring fair prices for waste workers and integrating informal sector workers.

4. Governance issues, including lack of transparency, compliance with guidelines and conflicts of interest, have hindered the effectiveness of many EPR systems in delivering the best environmental and social outcome.

The study proposes a reimagined approach to EPR that addresses these shortcomings:

1. Integrating EPR within broader waste reduction and circular economy strategies:

In order to ensure that EPR contributes to absolute environmental benefits rather than just managing increasing waste volumes, it should be part of a comprehensive policy framework that includes caps or reduction targets for waste generation. Policymakers should align EPR with zero waste principles, promoting product longevity, reusability, repairability, and recyclability from the design stage.

2. Incorporating strong incentives for eco-design and reuse:

Implement robust eco-design incentives through essential requirements and fiscal measures. Set ambitious targets for reusable packaging and products. Mandate EPR

systems to allocate a significant portion of their budget to finance prevention initiatives and reuse infrastructure, fostering a shift from single-use to reusable systems and products.

3. Ensuring just transition for Waste Pickers and informal workers, particularly in the Global South:

Develop clear guidelines for fair compensation of waste workers, including informal sector integration. EPR fees should cover full service costs, not just material values. Implement capacity-building programs and social protections for waste workers. Ensure waste picker and waste worker organisations, member based waste picker and waste worker organisations, including self-help groups, federations of self-help groups, trade unions , cooperatives and trusts have a voice in EPR system design and implementation, promoting inclusive decision-making processes.

4. Improving governance structures to enhance transparency and prevent abuse of power:

Establish independent oversight bodies to monitor producer responsibility organisations (PRO) activities and financial flows. Mandate regular, public reporting of key performance indicators. Include diverse stakeholders in PRO governance structures, balancing producer interests with environmental and social considerations. Implement strict conflict of interest policies to prevent PROs from obstructing progress on waste reduction and reuse initiatives.

5. Prioritising high-performing collection systems like Deposit Return Schemes (DRS):

Set high collection and minimum recycling targets in the legislation. Implement DRS for appropriate product categories from the outset of EPR systems (unless other systems are in place that deliver similar results). Design DRS to be inclusive, allowing integration of waste pickers. Ensure DRS infrastructure is compatible with future reuse systems, facilitating a transition from single-use to reusable packaging.

By adopting these recommendations, EPR can evolve from a mere waste management tool to a catalyst for systemic change towards resource efficiency and circularity. This transformation is crucial for addressing the triple planetary crisis of climate change, biodiversity loss, and pollution.

The study concludes that while EPR alone cannot solve all waste-related challenges, a well-designed EPR system integrated with complementary policies can play a pivotal role in building a sustainable, circular economy that respects both planetary boundaries and human dignity.

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2. INTRODUCTION

Extended Producer Responsibility (EPR) has been a cornerstone of waste management policies for decades, promising to shift the burden of waste management from municipalities to producers. However, as global waste volumes continue to rise and environmental crises intensify, it's crucial to critically examine EPR's effectiveness and potential for improvement.

2.1 Purpose of the study

This study analyzes the performance of EPR systems worldwide, identifying key challenges and proposing innovative solutions. By reimagining EPR as a tool for systemic change rather than mere waste management, we aim to unlock its full potential in driving a circular economy, reducing environmental impact, and ensuring a just transition for waste workers.

2.2 Methodology and approach

Drawing on case studies, desk research, expert insights, and emerging best practices, this research offers a roadmap for policymakers, industry leaders, and environmental advocates to transform EPR into a powerful catalyst for sustainable resource management in the 21st century. The study has a global scope and whilst most of the research is around packaging the findings of the study can be generally applied to the development of EPR systems on any material or product.

The first part of the study (points 4 and 5) draws on the experience from 30 years of implementation of EPR, with a particular focus on Europe, since it is the region where EPR has been in operation for the longest. It also incorporates analysis from other EPR systems rolled out in the rest of the world and offers a critical analysis of what EPR systems have delivered and how they have shaped the political agenda.

The second part of the study (point 6) presents proposals to address the challenges detected during the first part so that EPR can deliver more than what has been delivered so far.

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3. HISTORICAL CONTEXT AND EVOLUTION OF EPR

Waste management was invented the day waste ceased to have enough value for the (informal) economy to take care of it. When the value of waste is higher than the cost of collecting and treating it, there are enough drivers for collection and treatment to be informally organised. However, when the cost of collecting and treating waste is higher

than the value of the material, it is highly likely that this material will end up in the environment... unless someone pays for this difference.

The value of waste is not stable and can fluctuate over time, subject to variables such as changing supply and demand, lack of access to credit or long payback periods. When left to the market the same waste that makes economic sense to collect today will be littered the moment the cost of collecting and recycling is higher than producing a new item with virgin materials.

Plastic waste is a paradigmatic proof of this. For most polymers, the cost of collecting and treating plastic waste substantially exceeds the value that one can extract from the material, as a consequence, it ends up in the environment.

For the reasons explained above a non-degradable but highly littered item is packaging. Litter started in the high consuming countries, normally located in the global north, the decades following World War II and with globalisation it spread globally. Until the 1970s, the global north relied on reusable and returnable packaging and waste was a relatively minor issue. The rise of single-use packaging in hand with planned obsolescence and disposable culture caused the disappearance of old systems and spurred the creation of public waste management systems. These systems were organised by municipalities and covered by tax-payers.

3.1 Origins of EPR

The economic boom following World War II led to further industrialization and environmental challenges. In response, some governments and international bodies began to consider more systematic approaches to environmental protection. This period saw the emergence of the idea that those who cause environmental damage should bear the costs of managing and mitigating that damage.

The OECD's 1972 Guiding Principles Concerning International Economic Aspects of Environmental Policies stated that "the polluter should bear the expenses of carrying out the measures decided by public authorities to ensure that the environment is in an acceptable state." This principle was intended to prevent distortions in international trade and investment and to ensure that the costs of pollution control were internalised by polluters rather than being borne by society at large. It also assumed that if polluting was made more expensive, the price tag would act as an incentive for producers to reduce pollution.

The 1972 United Nations Conference on the Human Environment in Stockholm further cemented the Polluter Pays Principle (PPP) in international environmental policy. Principle 16 of the Rio Declaration on Environment and Development, adopted at the 1992 Earth Summit in Rio de Janeiro, reiterated the importance of the principle, stating that national authorities should endeavour to promote the internalisation of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution.

It was in this context of using cost internalisation as an incentive for producers not to pollute where the concept of Extended Producer Responsibility (EPR) was proposed by many, and theorised by professor Thomas Lindhqvist. Whereas the PPP focuses broadly on ensuring that polluters bear the costs of pollution, EPR is a tool which specifically targets producers, extending their responsibility beyond the production phase to include the entire product lifecycle. Lindhqvist defined EPR as:

> *a policy principle to promote total life cycle environmental improvements of product systems by extending the responsibilities of the manufacturer of the product to various parts of the entire life cycle of the product, and especially to the take-back, recycling and final disposal of the product*

The wording was clear about extending the responsibility of the producer and the principle was intended to be used to influence upstream as much as downstream measures. However, back in the 1990s European municipalities were increasingly feeling the costs of waste management and this was going to have a key impact in the implementation of the EPR concept. Waste volumes and complexity were increasing and more expensive disposal methods such as sanitary landfills and incinerators were making the costs unbearable. In this context, the idea of making producers pay for the end-of-life of the products and packaging they placed in the market was a way to finance the increasing waste management costs and this is what turned the EPR idea into law in some countries. EPR was later was embedded in the EU law (art 3 of Waste Framework Directive 2008/98/EC) which defines it as:

'a set of measures taken by Member States to ensure that producers of products bear financial responsibility or financial and organisational responsibility for the management of the waste stage of a product's life cycle.'

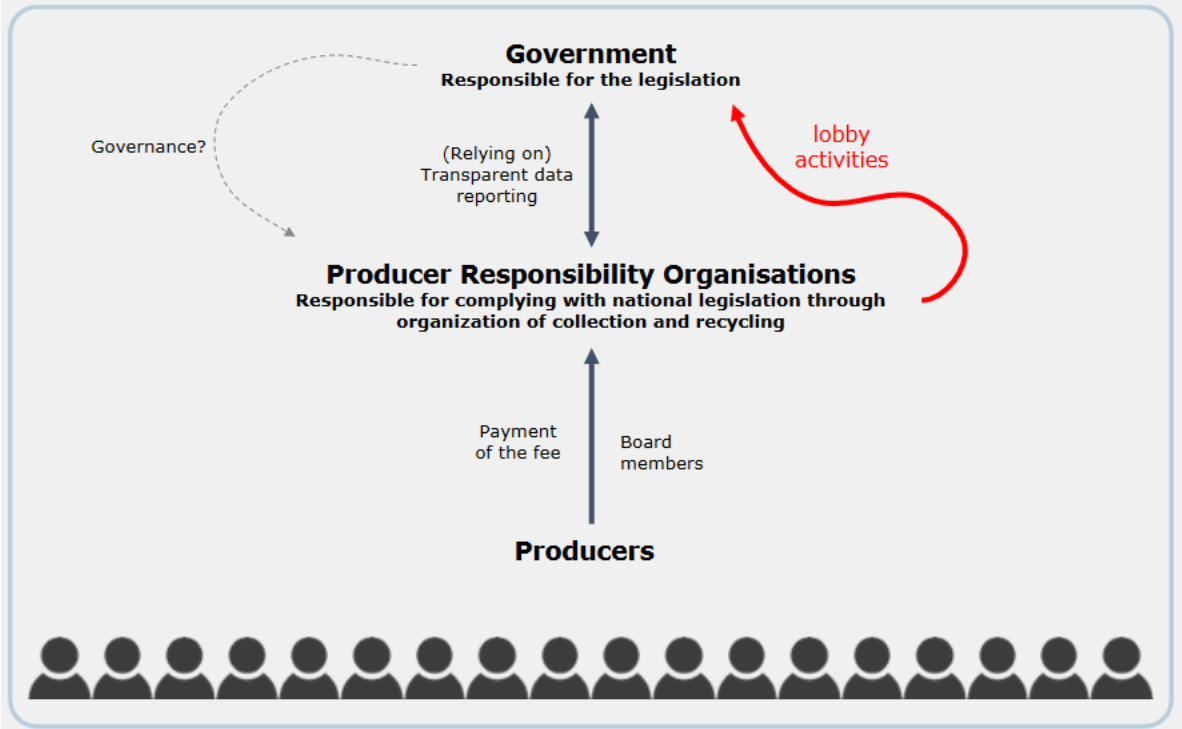
Whereas Lindhqvist was leaving the options open for EPR to work upstream the EU definition clearly sets the scope of EPR to deal with "the waste stage of a product's life cycle".

Progressively, EPR gained acceptance and the EU adopted a range of producer responsibility laws covering packaging, batteries, waste electrical and electronic equipment, end of life vehicles and more recently also textile waste. Some countries have decided to expand the scope of EPR to cover a lot more sectors (France has 24 sectors covered by EPR). At global level over 500 operational EPR based schemes have been found. Today EPR has become a key tool to finance and organise waste management activities with insufficient tools to impact product design, despite the original purpose of EPR to deal with "various parts of the entire life cycle of the product".

Because of the role of EPR in implementing the PPP there has often been the expectation that EPR would be a tool to reduce pollution, not only by preventing that waste ends up in the environment but also by preventing waste generation altogether. Indeed, to what extent the polluter pays principle could become a right to pollute (I pay therefore I can pollute) has been one of the criticisms to the approach.

A much less studied aspect is the socio-political role that PPP and EPR have played in normalizing pollution. EPR is presented as a technical solution to deal with a technical problem; i.e. there is a waste problem and those who placed this waste in the market should pay for its management. It is assumed that producers have an interest in reducing pollution in order to reduce cost but as we will see later on this assumption has proven to be wrong and one can argue that the polluter pays principle has become a right to pollute principle.

Any technical solutions such as EPR, incineration or chemical recycling are not neutral and have to be understood in the context they are introduced and how they shape reality, reinforcing or weakening existing and/or emerging systems. Creating new structures and systems will always influence the policies that are to come and not always in a positive manner. In countries with consolidated EPR systems, especially in those with only one Producer Responsibility Organisation (PRO), these PROs have emerged as extremely well-funded political lobbies with considerable impact on the political agenda. This role might have been planned or not but it is a fact that consolidated PROs are today very strong political players with access to knowledge, funding and high-level contacts and have relatively little oversight by public authorities. The power of PROs to shape the realities in which they operate, and from which they benefit, is therefore considerable.

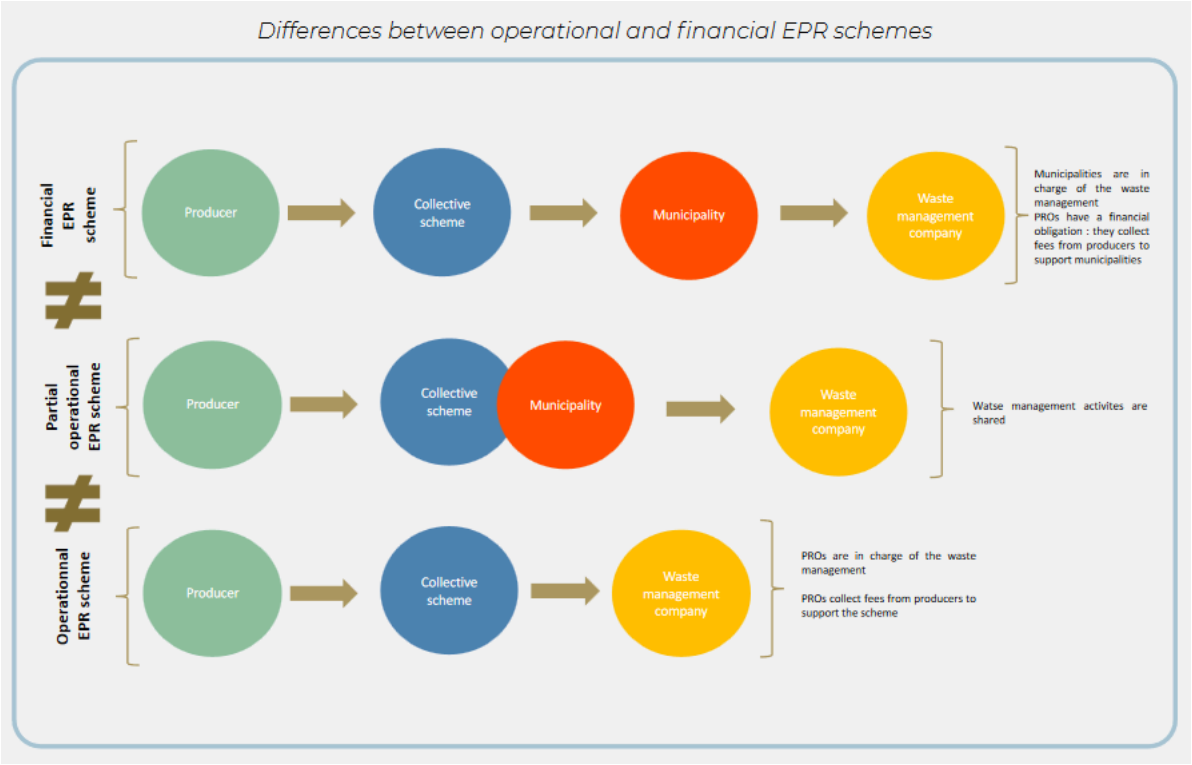


Source: [Fair Resource Foundation – EPR position (image 2)]

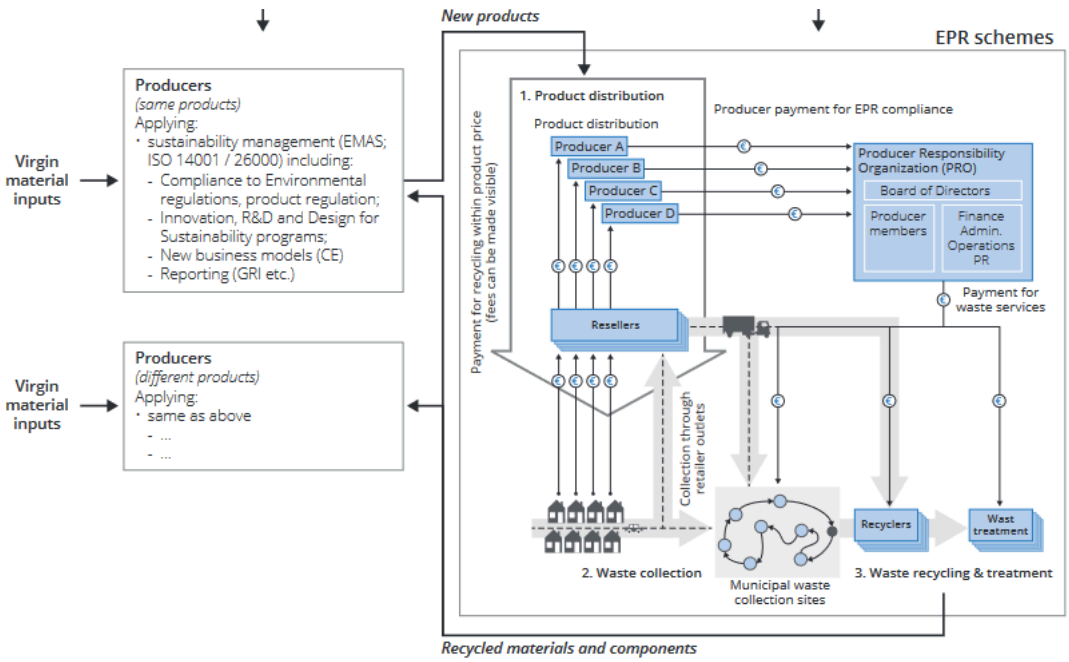
3.2 Global implementation of extended producer responsibility

EPR literature delves into the different degrees of financial responsibility and organizational/operational responsibility of producers. The former defines the degree of producers' involvement in covering the costs of administration, collection and communication of running the system whereas the latter defines to what extent are producers involved in the operational service of the provision.

Differences between operational and financial EPR schemes



Source: https://fairresourcefoundation.org/wp-content/uploads/2024/04/EPR-Position-Paper-Final.pdf



Source: EPR schemes in the context of wider policies and regulations (contextualizing the presentation by (Mayers and Butler 2013)

Globally, EPR is considered a policy principle, which means that there is no strict way to implement EPR. As a result, different countries in the world have used a different approach. Defining the way to implement EPR systems is crucial to ensure cross-consistency and coherence, and eases the comparison between the different performances.

The way EPR is codified in EU law it is clear that producers "bear financial responsibility or financial and organisational responsibility for the management of the waste stage of a product's life cycle" whereas the financial responsibility is much less ambiguous in the US which define EPR as "policies that place a shared responsibility for end-of-life product management on producers"[1].

Many countries in the global south have been adopting EPR laws with a high degree of divergence in the approach when it comes to financial responsibility and operational responsibility. For instance the study "Mismanaged Sachets: Will EPR Solve the Plastic Problem" concludes the following regarding India, Indonesia and the Philippines:

"India has separate policies on EPR for different streams such as plastic, e-waste and batteries. For the EPR system that focuses solely on plastic packaging and despite having set recycling targets the law does not clarify operational or financial responsibilities. Instead of delineating that producers should pay for the collection and treatment it opts for a system of tradable certificates which cannot deliver on cost coverage since producers only pay the credits generated by the waste that is collected,

[1] EPA (2021) National Recycling Strategy: Part One of a Series on Building a Circular Economy for All, November 2021.

not bearing responsibility for what is not. Without proper financial coverage it will be hard to ensure that plastic waste will be collected and the recycling targets met.

In the Philippines, the EPR law mandates the collection of plastic packaging but doesn't enforce recycling. Instead, it allows for incineration and co-processing and in lack of recycling targets and clear definition of financial responsibilities, as a result the EPR law is not having much impact.

In Indonesia, the EPR law does not clarify the operational and financial responsibilities between producers and local authorities and this ambiguity allows producers to argue against responsibilities. It is good that it sets targets for waste reduction and less good that there are no collection or recycling targets. Overall the lack of measures to enforce these targets makes the EPR law rather toothless."

These are just some examples that serve to present the different approaches to EPR across countries. The key challenges one can observe with EPR implementation include unclear roles/responsibilities, funding uncertainties, modest targets, auditing gaps, and limited drivers for packaging redesign. Recommendations emphasize clarifying operational and financial responsibilities, setting enforceable recycling targets, requiring full producer funding for collection/recycling systems, establishing coordinating bodies, auditing compliance, and using economic instruments to influence packaging design.

What is the role of EPR?

EPR is often approached in isolation, as a tool to organise waste management. However, any tool operates in a wider ecosystem and, be it by action or by omission, it helps shape it. The approach of this study is that EPR should be considered as one more tool in the toolbox of tools to address environmental impact and sustainable use of resources, contributing to a fairer society. Therefore, we will analyse the performance of EPR in the wider framing of sustainable use of resources, just transition and pollution reduction.

Indeed, producer responsibility is often seen as a goal in itself when it should be only a means to the higher end of reducing pollution. Hence, a legitimate question for the right promotion and use of EPR in the future is to analyse under which conditions the roll-out of EPR systems can contribute to improving the environmental and economic situation. For instance, evidence shows that systems that make producers financially responsible deliver much better collection rates than systems with shared or unclear responsibilities.

Not all EPR systems are the same nor produce similar outcomes. For instance, European EPR systems based on product take-back requirements (which commonly involve establishing either mandatory or voluntary recycling and collection targets for specific products or materials, and assigning responsibility to producers or retailers for end-of-life management to achieve these targets) deliver an average of 67% collection rate for

packaging waste[2] (plastic packaging separate collection being at 39%[3]). However, if we single out EPR systems run with a Deposit and Refund System (DRS), which in 2029 will be compulsory for beverage packaging in most EU countries, the average collection rate would be above 90%.

Other EPR schemes in the Americas with a lot less clarity on the way EPR should be implemented (shared responsibility makes it unclear who should pay for what, who is responsible for collection, etc) manage to collect much less recyclables. The US official recycling rate for packaging is at 13%. Other American countries implementing EPR are Chile, Brasil, Colombia, México and Uruguay[4], some of them through a shared responsibility between producers and public authorities and others with a clearer delineation of responsibilities. However, they all share a lack of proper governance and reporting. After 20 years of EPR law Uruguay reported a 4% recycling rate in 2022 and others are slightly above this figure. In general, the quality of the data is poor and besides the packaging which has intrinsic market value such as metal or PET it is fair to say that EPR has not provided much of a change in terms of collection or recycling rates.

In Asia and Africa most collection happens outside EPR systems and is mainly driven by the value of recyclables, as a result PET is normally collected whereas waste with less value, such as sachets, is not.

There are many different types of EPR and they provide different performance; some EPR systems do not provide much data as to the levels of capture at all. In Europe a typical EPR system for plastic packaging captures between 30 and 60% of the product is placed in the market (a state of the art EPR system such as the Belgian Fost Plus PRO captures 59%[5], a less efficient one such as the Spanish Ecoembes captures 36%[6]), whereas in the US EPR system for packaging captures less than 25%.

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4. CRITICAL ANALYSIS OF CURRENT EPR SYSTEMS

After having considered the initial thinking of the EPR concept and how it is working, we will now proceed to analyse how its roll out has impacted waste generation, reuse, just transition, governance and transparency.

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[2] https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Packaging_waste_statistics#Waste_generation_by_packaging_material

[3] https://ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-20231019-1

[4] Iniciativa Regional para el reciclaje inclusivo (IRR), 2018

[5] Review of EPR for Packaging Waste In Belgium, Maxine von Eye, Fair Resource Foundation, 2023

[6] https://zerowasteeurope.eu/library/analysis-of-the-separate-collection-rate-of-plastic-beverage-bottles-up-to-three-litres-in-spain/

4.1 EPR and waste generation

The countries in the world with the longest track record of EPR policies are the EU member states. Most EPR systems for packaging were rolled out in the 1990s, when different types of EPR systems were set up as well as the corresponding Producer Responsibility Organisations (PRO) which are responsible to organise the funding of the collection of packaging which was normally delegated to the local authorities. In the early 2000s all the EU countries had EPR systems in place as mandated by the Waste Framework Directive (2008/98/EC).

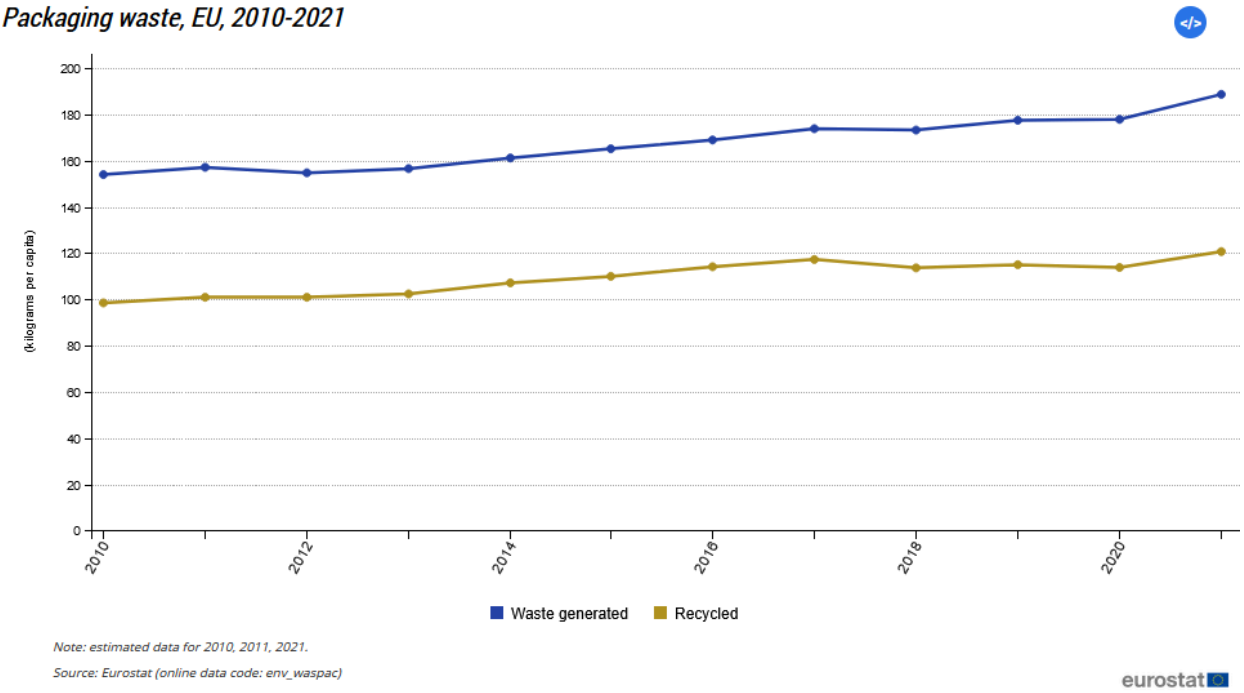
The implementation of EPR systems was successful in making producers pay for the collection of part of their waste and allowed for the construction of collection, recycling and disposal infrastructure across Europe. Data from last decades shows that this resulted in an increase of collection, recycling and incineration rates, which could have diminished the environmental impact of the sector had it not been for a substantial increase in waste generation.

Evolution of waste streams over the last decades show a strong correlation between waste generation and implementation of EPR policies. For packaging, since the implementation of EPR policies in the late 1990s and latest EU wide data available, packaging waste collection grew to stabilise at 67% in 2011 whereas packaging waste generation has increased 20% per capita in the last 20 years. Plastic packaging in particular has increased 27% in only 10 years.

In countries which have implemented EPR in other waste categories the waste generation has always increased. For instance, France is the country with the highest number of running EPR systems with 24 streams and, according to Ademe[7] ,it has seen how since

[7] https://www.ademe.fr/en/frontpage/

2017 waste has increased across all categories covered by EPR systems.



The key question to address is how much causality is in this correlation. One can argue that European and national legislation which actively prioritised single-use packaging over prevention and reusable packaging (by setting recycling targets and not prevention or reuse targets), and within single-use packaging it prioritised light-weighing (EPR fees are to be paid by weight which prioritises lighter materials like plastic over heavier ones such as glass) are drivers that explain the rise of plastic packaging and waste generation in general. On the other hand, it is also true that other sectors such as textile waste have seen an important increase in waste generation in the same period and countries and this happened in absence of EPR. It can also be argued that in the global south the rise of single-use packaging happened before EPR was implemented and it was precisely waste generation which caused international reports[8] and institutions[9] to call for the need to roll-out EPR in these countries to manage the existing waste.

However, there is also no evidence that the implementation of EPR on its own has led to a reduction in waste generation. In any case, had this been the case, it would be equally hard to find causality in that correlation since EPR on its own is not a tool designed to prevent waste but rather to manage it.

There have been attempts to use EPR to address eco-design and waste generation by setting different EPR fees to different materials and applications depending on aspects such as the weight, the recyclability or the hazardousness. This is known as

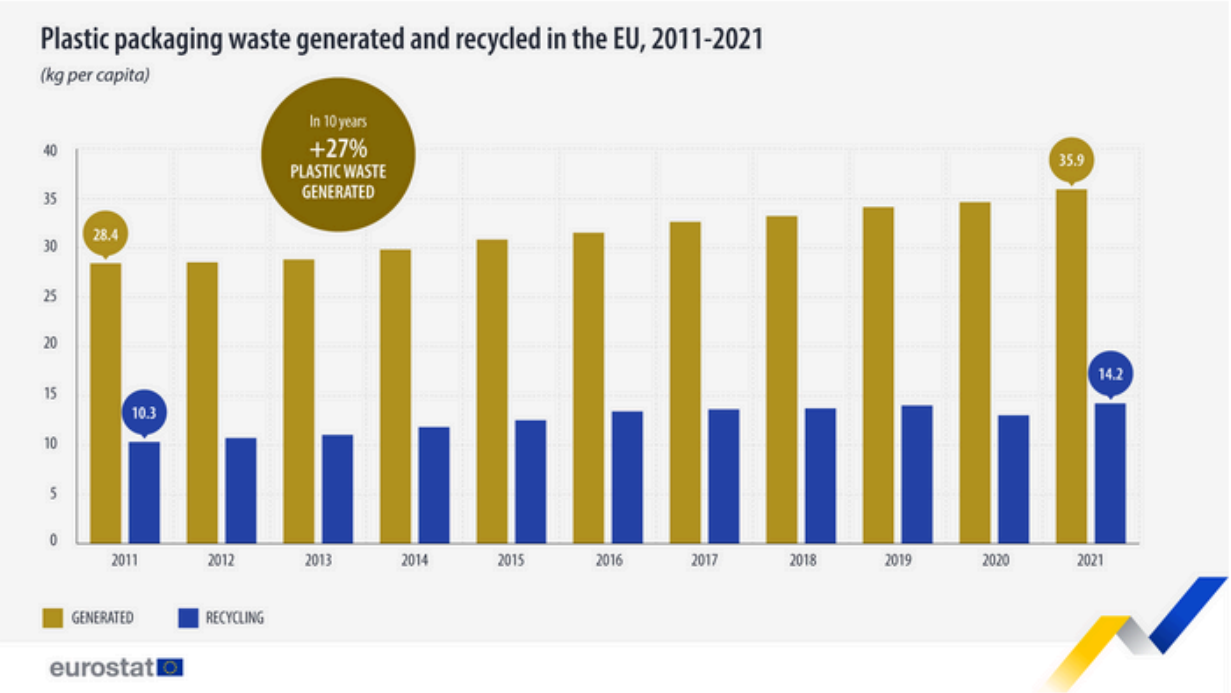
[8] Stemming the Tide, 2015, Ocean Conservancy
[9] Extended Producer Responsibility, Updated guidance for efficient waste management, 2016 https://www.oecd.org/en/publications/extended-producer-responsibility_9789264256385-en.html

ecomodulation of fees and after years of application, experience shows that this ecomodulation is not significant enough to have an impact in neither design nor waste generation (by influencing consumer or producer behaviour) [10]. Typically, EPR fees represent less than 2% of the cost of product or packaging (sometimes as little as 0,1%)[11] and modulating such a small fraction doesn't have enough impact to influence ecodesign. For instance, in 2024 the Belgian PRO FostPlus, which is considered to be state-of-the-art EPR, was charging an EPR fee of 0,0646 euro per kg of PET and 0,0591 euro per kg of steel. If a PET bottle weighs 15gr (8-10gr for water, 20-23gr for carbonated drink) this level of EPR fees means that the consumer pays 0,0009 euro per bottle. In other words, paying 100 times less than 1 eurocent for a product which costs between 1 and 3 eur means that the overall potential incentive represents between 0,00009 and 0,00003% of the cost of the product. On the other hand, for a producer placing in the market a small amount of 100 million PET bottles, the fee will amount to around 1,500eur. Given the magnitude of the figures it is clear that the ecomodulation of EPR fees is designed to influence the producers and not the consumers.

Moreover, in the EU the ecomodulation has to stay within the limits of cost-coverage (art 8a, WFD 2008/98) which means that there is no room for using EPR ecomodulation as a proper economic incentive. Later on in point 6.1 we will explore the best way to influence consumer behaviour.

[10] (Gottberg et al., 2006; Kautto, 2006; OECD, 2006; Tojo, 2006a; Mayers, 2007; Subramanian, Gupta and Talbot, 2009; Kemna, 2011; Huisman, 2013; Kunz, Mayers and Van Wassenhove, 2018)

[11] https://www.uu.nl/sites/default/files/White-paper-on-Pathways-for-Extended-Producer-Responsibility-on-the-road-to-a-Circular-Economy.pdf



4.2 EPR and reuse

When we observe the evolution of reusable packaging over the last decades since the roll-out of EPR systems in Europe we can find an even more acute correlation between the rise of management of single-use packaging and the demise of reuse systems.

In the EU, the share of refillables in the beverage market has plummeted in the last decades despite the fact that the waste hierarchy enshrined in EU law since 2008 clearly states that reuse should have preference over recycling and disposal. However, whilst recycling was given the means to be rolled out with definitions, methodologies, targets and the obligation to implement EPR systems for several waste streams, reuse was not given any of these and the legislation purposely conflated "preparation for reuse" with "recycling". Art 11 of the WFD (2008/94) set targets which could be achieved with reuse or recycling:

(a) by 2020, the preparing for re-use and the recycling of waste materials such as at least paper, metal, plastic and glass from households and possibly from other origins as far as these waste streams are similar to waste from households, shall be increased to a minimum of overall 50 % by weight;
(b) by 2020, the preparing for re-use, recycling and other material recovery, including backfilling operations using waste to substitute other materials, of non-hazardous construction and demolition waste excluding naturally occurring material defined in category 17 05 04 in the list of waste shall be increased to a minimum of 70 % by weight.

Since the 1990s the EU waste policy has been all about providing the legal certainty and financial and legal instruments for recycling and incineration to replace landfilling whilst

the upper levels of the waste hierarchy were ignored. Unsurprisingly, waste generation has increased and reuse rates have plummeted across the board. In the next table one can see how refillable beverage packaging has gone from being the most used system to deliver soft drink, beer and cider to almost disappearing. The only exception being Germany, the only country in Europe which, back in the day, set minimum reuse quotas which were instrumental to keep the refillables market alive.

Change in refillables market share for beer & soft drinks, 1999-2019 (Source Global Data - Reloop 2019)			
Countries	Market share refillables 1999	Market share refillables 2019	Difference
Denmark	93%	13%	-80%
Finland	80%	4%	-76%
France	9%	3%	-6%
Germany	73%	54%	-19%
Romania	70%	13%	-57%
Bulgaria	74%	22%	-52%
Hungary	63%	11%	-52%
Spain	35%	20%	-15%
Sweden	44%	4%	-40%

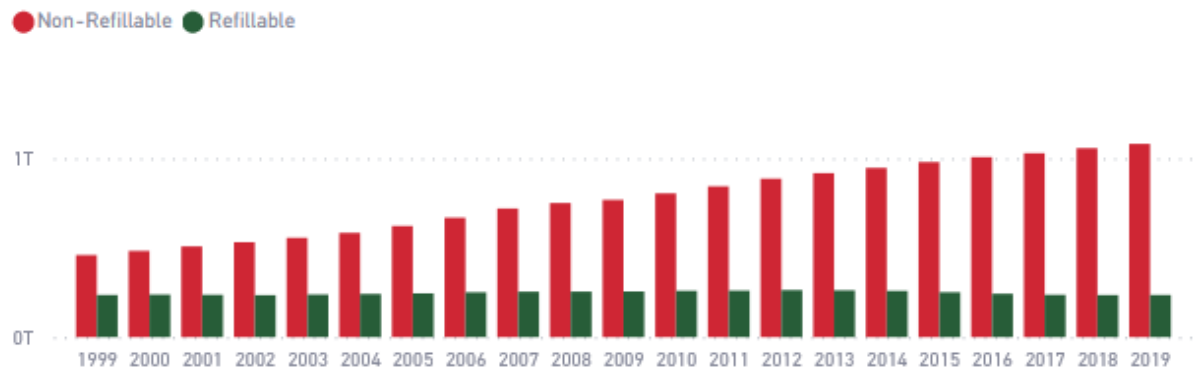
For the non-beverage sector the decline in the use of reusable packaging has probably been even more abrupt given the lengthening of supply chains and the rise of big distribution which typically requires more packaging in detriment to the refill systems that were used when supply chains were shorter. Indeed, beverage packaging is easier to track because beverages are almost always sold with packaging, be it reusable or single-use. However, for lots of other applications such as public markets where products have traditionally been sold in bulk and consumers bring their own packaging the shift to single-use can only be measured by the increase in single-use packaging such as plastic bags or sachets. Currently, almost one trillion plastic sachets are consumed annually[12] when they didn't exist only 30 years back.

Again, despite the strong policy drivers at European and national level to prioritise single-use packaging over reusable packaging, the correlation between implementation of EPR and the demise of reuse may not imply causality since global data indicates that the replacement of refillable packaging with single-use has been a global trend. In the next table we can see how the decline of refillables has not happened at the same speed everywhere, with countries such Indonesia where refillables have gone from omnipresence to marginality whereas in other countries such as the Philippines refillables were still the majority of packaging by 2019. Regardless, the global trend of replacement of reusable packaging with single-use is clear.

[12] Future Market Insights (2023) *Sachet Packaging Market, Global Industry Analysis 2018-2022 and Opportunity Assessment 2023-2033*, available from www.futuremarketinsights.com

Change in refillables market share for beer & soft drinks, 1999-2019 (Source Global Data - Reloop 2019)			
Countries	Market share refillables 1999	Market share refillables 2019	Difference
Brazil	40%	24%	-16%
China	52%	22%	-30%
Egypt	63%	15%	-48%
India	87%	34%	-53%
Indonesia	76%	4%	-72%
Mexico	56%	28%	-28%
Nigeria	87%	43%	-44%
Pakistan	88%	27%	-61%
Philippines	86%	59%	-27%
Russia	64%	5%	-59%
South Africa	51%	26%	-25%

SALES (UNITS) BY YEAR, REFILLABLES AND NOT REFILLABLES WORLDWIDE



Source: What we waste dashboard, Reloop

Same as with waste generation, whilst the causality between EPR roll-out and decrease in reuse quotas is not clear there is evidence that no EPR system to date has contributed to moving up the waste hierarchy from recycling to reuse or prevention.

4.3 EPR and DRS

Currently, the most performing type of EPR working at scale are Deposit Return Systems (DRS). DRS is an EPR system where consumers pay a small deposit when purchasing a product, which is refunded when they return the empty container.

They deliver capture rates well over 90%. This is why it is highly encouraged by European packaging and plastic legislation. In the Single-use Plastics Directive (SUPD), DRS is encouraged by mandating high separate collection targets -90% of PET bottles by 2029-.

In Packaging and Packaging Waste Regulation (PPWR)[13], DRS is explicitly mandated for single-use plastic bottles and metal cans (up to 3L) in order to achieve the 90% target by 2029.

The other side of the coin of delivering high collection rates is that DRS is a powerful tool to fight littering. In Australia and the US, the coastal debris surveys showed that the proportion of beverage containers littered on the coasts was 40% lower in states with a DRS legislation for these containers than in states without a DRS. In Estonia, after the introduction of a DRS for beverage containers, the share of beverage containers amongst littered items along roadsides dropped from 80% to below 10%. In Germany, the share of beverage containers amongst total litter dropped from 20% (in 1998)[14] to "almost zero" two years after the introduction of a DRS on one-way beverage containers in 2005.

A key lesson to draw from the 30 years of experience in implementation of EPR systems is the importance of planning well from the outset. Given the well-documented superior performance of DRS systems over other EPR systems (with collection rates which normally double or triple those of other EPR systems), it is important that these systems are given priority over the others. There are two reasons for this.

Firstly, it is much easier to implement DRS from the beginning than implementing them once other EPR systems are running. The experience in Europe shows how PROs, once created, may actively prevent the creation of DRS. Indeed, DRS will not only remove the most recyclable fractions from EPR making it more expensive to run (per unit of material), but they also expose the intrinsic problem of allowing mostly non-recyclable packaging in the market.

Secondly, whereas other EPR systems finance infrastructure for waste management, DRS systems are the only EPR system whose infrastructure can be potentially used to handle both single-use and reusable packaging. Since, according to the waste hierarchy reuse is above recycling, having a system which can handle returnable packaging as well as single-use is a cheaper and easier way to organise the transition from waste management to resource management.

The EU is an example of bad practice in this field; since the 1990s its packaging legislation pushed for EPR and other measures to manage waste but omitted any mention of DRS or reuse systems. Only in 2021 the Single Use Plastic Directive (SUPD) and in 2024 the Packaging and Packaging Waste Regulation (PPWR) started amending this situation with concrete measures to introduce DRS systems to increase collection rates and start reintroducing reuse.

For this reason, learning from the European missed opportunity, any institution considering to implement EPR should include DRS in the plan from the outset, unless systems are in place which deliver similar performance. This can be done by introducing the tool in the legislation the same way as EPR is, with a clear definition and guidance, or

[13] Final agreed text, pending formal approval: https://data.consilium.europa.eu/doc/document/ST-7859-2024-INIT/en/pdf

[14] Global Deposit Book 2022, Reloop https://www.reloopplatform.org/global-deposit-book-2022/

by mandating certain collection rates to be attained. For instance, the EU SUPD and PPWR mandate 90% collection rate for beverage packaging and whilst it allows member states to use EPR to attain those targets it does mandate the introduction of DRS by 2029 if other EPR systems are not capable of delivering the collection rates. In addition, the PPWR, in its Annex X, establishes a minimum criteria for the implementation of DRS, when it comes to the deposit fee, equal access, operation, reporting, governance structure, among others.

Such an approach of targeting the performance more than mandating the instrument is also useful in situations where no EPR or DRS are yet in place. For instance, in India where some waste picker cooperatives are already collecting over 90% of the beverage packaging and handling the reusable containers, the system would need to recur to implementation of DRS collection only in those places where the performance levels are not reached by other means such as door to door collection by wastepickers cooperatives.

For instance, in Uruguay, collection rates of packaging are under 5% and hence it makes sense to mandate a DRS system across the board designed to include wastepickers in the new collection system.

4.4 EPR and cost coverage

In an EPR system as it is organised in Europe, producers pay a fee that is proportional to the volumes they place in the market and should be enough to cover the costs of running the system (administration, communication sorting and treatment).

According to European EPR legislation the contribution by producers is to be administered by a Producer Responsibility Organisation (PRO) which then pays the local authorities in charge of collection for the above mentioned costs. Many stakeholders in Europe complain about the fact that PROs do not cover all the costs of collection and management for instance:

"I*f we compare the €1.6 billion in net costs with the approximately €644 million paid by Citeo to local authorities in 2021, we find that local authorities have €1 billion left to pay*," says a spokesperson for Amorce, France's main local governments union. Citeo said it cannot comment on the case but added that in 2021 it supported local authorities with €847 million. A spokesperson added: "*Through these eco-contributions from marketers, Citeo finances 73 per cent of the gross reference costs of collection, sorting and treatment of household packaging.*"

Norwegian municipalities are not much happier Svein Kamfjord, director at Samfunnsbedriftene, an umbrella organisation for public waste companies said "*We pay more than one billion NOK [around €88.6 million] per year for handling plastic packaging waste that the producers should have financed*,"[15].

[15] https://www.investigate-europe.eu/posts/producers-wield-power-over-plastic-pollution

In any country where EPR is implemented there are always complaints about the producers not paying enough. The difference is that in some countries such as in the EU, the legislation explicitly mentions the responsibility for producers to cover the costs of at least collection and treatment, whereas in most other countries this responsibility is not even defined.

In Indonesia in lack of clear guidance, some brands are setting up their own collection and treatment systems bypassing the local authorities. For instance, Unilever set up a system in 2017 to pay waste pickers to collect plastic sachets to feed a chemical recycling process in Sidoarjo. The system proved to be expensive and plagued with technical challenges and was discontinued in 2019. Today, sachets continue to abound Indonesia without a clear path to manage them[16].

In India the EPR law focuses on plastic packaging and relies on tradable certificates for compliance, which provides uncertain funding for waste management improvements. As a result, there is no real cost coverage but rather a compensation based on the market value of collected materials, which does not bear any relationship to real cost of the service of waste collection and treatment.

Cost coverage is a topic that is generally not completely resolved anywhere. The higher the capture rates the higher the cost coverage since there is less waste escaping into the environment and hence it reduces the speculation about the cost of, for instance, cleaning the ocean (an option which has not even been considered given the impossibility to accomplish, let alone to pay for it). In this sense, a DRS system as it is implemented in some European countries which captures over 95% of a certain waste fraction is better at cost coverage (and, of course, in environmental performance) than an EPR system with roadside containers, which allows for over 50% of the waste to end up in the wrong bin or in the environment.

In the global south, well organised wastepickers can also deliver collection rates comparable to those of a DRS system in densely populated urban areas, however there is a challenge with littering in places where waste pickers will not be present or would not operate such as in nature or in sparsely populated areas. In these cases having a DRS system allows for an incentive for waste to be collected anywhere and brought back to a collection point, whereas an EPR system would only collect where there is collection infrastructure.

It is not a coincidence that systems designed to capture over 90% of waste deal with the most valuable and recyclable materials such as PET or aluminium whereas lower value and much more difficult to recycle packaging such as multilayer packaging are dealt with in collective systems, which collect all the remaining types of packaging, where costs are distributed. Cost mutualisation allows for non-recyclable and/or very expensive to collect waste to continue to be used.

There is a big difference in approach to the way EPR fees are organised in different parts of the world. Whereas in the global north the EPR fees are generally expected to pay for

[16] 2022, GAIA & Aliansi Zero Waste Indonesia, “Chemical recycling of sachet waste: A failed experiment”

the service of collection, treatment, communication and administration of the system, in the global south the idea of paying for the whole service is not widespread and instead wastepickers have to complement service fees (in those rare cases when they get paid service fees) with the sales of recyclables. Experience in the global south proves how only a tiny fraction of the real collection and treatment costs are borne by producers.

To give an idea of the magnitude of this gap it's worth illustrating what today is the exception to the rule, that of the system organised in Pune, India. There, waste pickers of SWaCH cooperative[17], who are authorised as the city's doorstep waste collectors, additionally recover multi layer packaging (sachets) for recycling under an agreement with a fast moving consumer good brand (ITC, formerly India Tobacco Company) to pay the cost of purchase, logistics and aggregation minus the sale of recyclables[18]. The cost of collection of packaging by organised waste pickers is of 20 Indian rupees INR (0,24$) per kilogram but they get only 4 INR (0,048$) per kg from recyclers. This means that for every kg of multi layered packaging waste collected by wastepickers (and sent for recycling[19]) the ITC pays them 16 INR (0,19$). In other words 79% of the cost of collection is not provided and has to be either shouldered by local authorities or/and citizens. There isn't a lot of data available about the real cost of the services provided by wastepickers versus the payment they receive but considering the level of organisation of Pune's wastepickers one can expect that in less organised communities the gap between the cost of the service and the revenues from selling recyclables is probably over 80%. Therefore, if cost coverage is not great in the global north it is almost non-existing in the global south. If producers would pay for the real cost of managing their waste in some packaging formats, notably if there would be a requirement for all packaging to be recyclable and recycled, some packaging formats such as multilayered sachets would have a stronger incentive to be replaced with an alternative format.

One of the main principles of the polluter pays principle which EPR is meant to implement is cost internalisation. Full cost internalisation is only possible when 100% of the waste is collected and treated, zero leakage into the environment is hard to achieve but there are systems like DRS that reduce the risk much more than other EPR systems. Cost externalisation has been and continues to be the main driver for the expansion of single-use packaging in the global south. Traditional reuse systems require reverse logistics and washing infrastructure that make the system leak-proof but more expensive. In contrast, the current system in which the cost of dealing with waste and pollution is externalised on the environment and public authorities, makes single-use systems comparatively more competitive. Although implementing real full-cost coverage would be

[17] https://swachcoop.com/

[18] This model is neither universal nor compulsory. As elaborated in other sections, the Indian EPR system doesn't oblige producers to pay and hence only voluntary agreements like this can stand out as an exception but have no legal backing.

[19] The fact that multilayered packaging is sent for recycling is rather exceptional since normally this waste fraction tends to end up in cement kilns. The reason this packaging can be sent for recycling is thanks to the fact SWaCH cooperative is already collecting and sorting other waste streams making it less costly to sort for recycling. In an overwhelming majority of cases sachets would be picked up from material recovery facilities as residual waste and sent for co-incineration.

the most effective way to change the system, producers cannot afford the cost of cleaning the environment. However, despite the legitimate claims from some local communities affected by waste that they didn't generate, nowhere are EPR fees considered in a retroactive manner and legacy waste is a liability that societies seem to have to accept. This environmental liability is something that brands may have to pay for one day, yet the discussion today in the global south is far from this and there is a lack of concerted approach as to how EPR fees should be calculated and implemented.

Whilst EPR systems need to adapt to different local realities, they should all aim at full cost coverage and the fees should be high enough to, at least, pay for the service of running the system. Today, in the global south, brands are externalising to society between 80% (in the exceptional cases when recycling takes place) and 100%(in the cases where no collection is in place).

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5. CHALLENGES WITH CURRENT INTERPRETATION AND IMPLEMENTATION OF EPR

The challenges with interpretation and implementation of EPR are of two kinds; on one hand there are the technical issues that need to be addressed in order to ensure the proper functioning of EPR around the world. Namely the legal clarity of the law mandating EPR, the governance of the system, the transparency in the functioning and reporting.

On the other hand, there is an underlying challenge with the current role that EPR plays from a socio-political perspective and the expectations that this tool can raise in terms of how much it is expected to deliver and how it will impact future roadmaps if it ends up creating a lock-in effect.

5.1 EPR and the illusion of control

The section 1.2 has explored how after decades of EPR laws waste generation continues to increase, recycling is unable to catch-up and solve the pollution issue, and alternatives that are higher up in the waste hierarchy have been deprioritized vis a vis recycling.

Whilst there is agreement among scholars that EPR is just a tool in the toolbox of waste management, the reality is that this tool has unrivalled power to mobilise funding and exert political influence. The funding for communication campaigns, building infrastructure, paying for collection, influencing public policies etc turns EPR systems into political creatures capable of generating the illusion that recycling is enough, which are effectively impeding to effectively reduce pollution, which was the ultimate purpose of the tool. Some illusions that powerful EPR systems can create are:

Illusion of prevention. Regardless of whether EPR has contributed or not to the increase in waste generation, the communication budgets in the hands of PROs are often the most

important funders of environmental communication in events and media, vastly outpacing the communication power of public authorities. These communications give the feeling to citizens that by separating their waste they are contributing to waste prevention, when in reality what they are effectively contributing towards is collection and, to a certain extent, to recycling.

Illusion of recycling. EPR is a system that can finance and organise waste collection but alone it does not provide a real incentive for redesigning products to be circular. As a result, the existence of a waste collection system conveys the impression that because waste is collected, it will be recycled, even when this is not true for many waste streams (single-use plastic sachets or beverage cartons in packaging, synthetic fibres blended with natural fibres for textiles, etc).

Illusion of reduction of environmental impact. When EPR is implemented without the right accompanying tools the result is an increase in the environmental impact caused by the institutionalisation of the right to pollute. The experience with EPR so far is that the benefit provided by the increase in collection and recycling is outpaced by the increase in waste generation.

5.2 The danger of lock-in into waste management infrastructure

The roll-out of EPR, even the best performing one, is conditioned by the projections of the waste that is to be collected and managed. Efficient planning of infrastructure should project the waste management infrastructure according to the estimated waste it should treat.

EPR roll-out implies big investments in collection, sorting and recycling infrastructure which have to be depreciated over time. Typically, depreciation takes place over more than 20 years of operation. Discontinuing operation before the infrastructure is fully depreciated reduces the financial viability of the project. Hence there is a legitimate interest to ensure that any new infrastructure will be in use for as long as possible.

However, nobody has a crystal ball and planning for such timeframes is always risky. For instance, if producers are currently placing 1 million tons of product in the market that will become waste the same year, the infrastructure plans will need to design collection and treatment/export for that 1 million tonnes plus the increase or decrease that is expected in waste generation. For instance, if the increase is foreseen to be 4% per year, after 20 years it will have to manage more than 2 million, i.e. twice as much as the moment when the infrastructure was planned. If instead of 4% increase there would be a 4% annual decrease after 20 years there will be 450,000 tons of waste to treat, 4 times less than a scenario with 4% growth.

Therefore, as useful as EPR systems are in mobilizing financing for collection, sorting and treatment, the fact that they mobilise hundreds when not thousands of millions of dollars and put them in the hands of PROs who have an interest in making the system run as efficiently as possible, and waste managers who want to manage as much waste as possible, together makes up a series of interests which can create a lock in effect into a

waste based system, even when better alternatives exist. When so much money is at play it can be that the PROs decide to mobilise politically by paying expensive lobbies or communication campaigns to prevent a better system which would challenge its economic model. For instance, in Europe the most important lobbies opposing implementation of DRS have been the PROs who run the EPR system.

Regardless of how legitimate the reasons can be to oppose changing the status quo, it is a fact that building a system which will mobilise lots of political and economic interests and even change the behaviors of citizens comes with lots of big implications. For this reason EPR policies cannot be planned in isolation or they risk stalling environmental policies in the future and costing lots of money to producers and tax-payers.

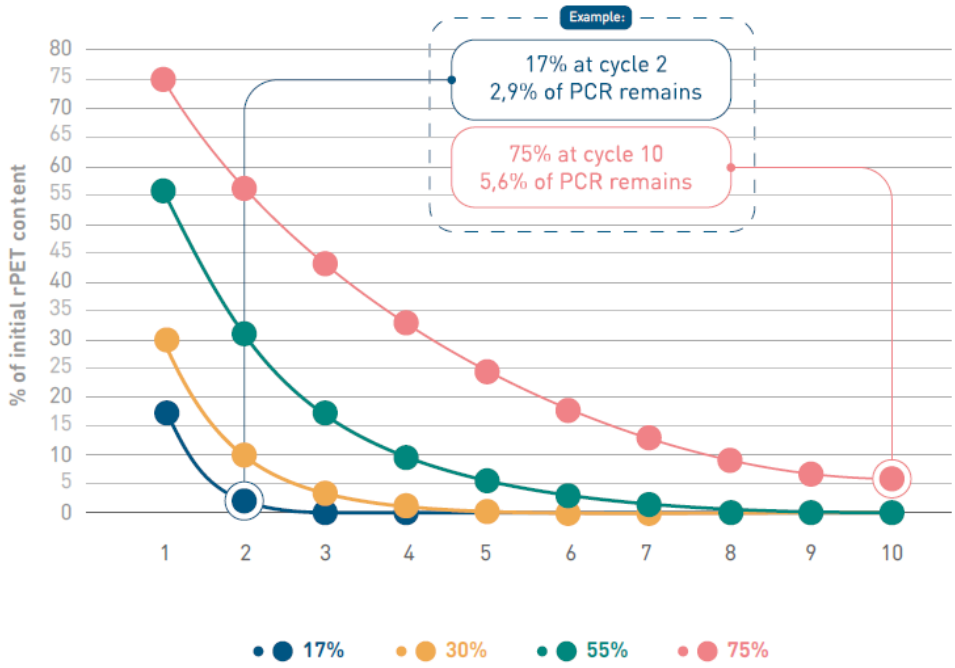
5.3 The EPR paradox: can a technical tool fix a sociopolitical problem

Waste management is often presented as a technical issue, which has to be managed and very rarely takes into account the nature of a problem that is not technical but sociopolitical. Waste is a human creation and it can be designed out of the system if the right incentives and regulatory frameworks are in place. For instance, single-use plastic sachets didn't exist 30 years ago, they are a human invention which suited a certain social and economic context. It is a choice to accept to have to manage this waste or to change the context so that a better option can replace them. If we take the example of plastic bags, many countries decided not to use EPR but rather ban or tax them, as a result in many countries plastic bags have almost ceased to be a problem. It's a political choice to decide to manage a waste or to phase it out.

After decades of active marketing, the public and most policy-makers have come to believe that the solution to waste generation is recycling. As much as real recycling is needed, it should remain an option of last resort as it is reflected in the waste hierarchy. Anything produced should bear in mind how it is going to be dealt with in its end of life, the fact is that any recycling process has losses and the only way to recover 100% of a material and its value after using it, is by avoiding that it becomes waste.

For instance, PET bottles are the plastic application with the highest collection and recycling rates in the world. However, from the point of view of material and value preservation, such a fast moving consumer good means that after a few months of having produced the bottle and having consumed, collected and recycled there will be no recycled content left at all. In the graph below one can see how due to the losses of any recycling process, if one assumes the cycle of production, bottling, consumption, collection and recycling of a PET bottle to be of one month, and we assume the highest recycling rate possible (75% material recovery of every PET bottle) after 10 months only 5% of the recycled content is left. At current average PET recycling rates no recycled content is left after only 4 cycles.

Figure 3.3: Longevity of Recycled Content within PET bottles



At the same time, there are systems which run with refillable PET bottles in which every bottle does more than 20 rotations before being recycled. This means that at the same pace of consumption of one month to do the whole cycle, most of the recycled content of the same PET bottle can be circulating in the system 10 years after. The decision between having the material and use value last either months or decades has more to do with political will and social norms than with technicalities.

The more EPR is presented as a technical solution the less we can address the roots of the problem, which happen to be sociopolitical and not technical.

EPR systems are designed to manage waste; the more waste it circulates the more money it will get to manage and the more money involved the more political influence against change it will gather. The more EPR is optimised, the less incentive to change the system. EPR systems are a tool that can be useful to mobilise resources to implement the right policies but the experience so far is that, due to lack of proper legislative frameworks, they do not solve the waste problem and, instead, they tend to legitimise and institutionalise waste.

That is when the **EPR paradox** appears and **the system which was presented as the key to fix the waste problem becomes the roadblock that stops progress and actively fights against any idea or plan to reduce waste generation**.

The EPR paradox reflects that EPR is a tool that we have not been using well. In the beginning of this section we have analysed how the origins of EPR are to be traced back to the implementation of the polluter pays principle and one can agree that this is something that EPR has partially managed to deliver. The polluter pays principle implicitly assumed that producers would have an interest to reduce pollution if they had to pay for it. Experience shows that producers prefer to pay for the pollution as long as the business is profitable and that the producer pays principle doesn't necessarily deliver on overall reduction of environmental impact.

In this time in which EPR is consolidated in some countries and it is on the way to be implemented in many others it is paramount to make the right use of this tool by putting at the service of an agenda to reduce waste generation and pollution, increase resource efficiency and contribute to a just transition.

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6. EPR COMPATIBLE WITH REDUCTION, REUSE AND JUST TRANSITION

So far, the roll out of EPR systems has been instrumental in funding waste management but has not contributed to reducing waste generation or maintaining reuse rates and has often created lock-in situations. We have also seen how EPR systems have helped resource and legitimate single-use linear systems and have created implementing entities (PROs) which have a life of their own and play an active role in shaping agendas that don't necessarily pursue the best environmental outcome.

Therefore, EPR is a tool that, if properly used, can deliver much more than what it is delivering today. This section will look into how EPR can help reduce waste generation, increase reuse rates and guarantee a just transition for waste workers.

6.1 Making EPR compatible with waste reduction

EPR is a waste management tool, not a waste prevention tool. Hence, on its own, EPR will not help prevent waste (as we have seen in section 4.1.). All other things being equal the only way EPR can help reduce the absolute environmental footprint is either by collecting and recycling waste at rates higher than waste is generated or by having stable or declining waste generation whilst growing recycling.

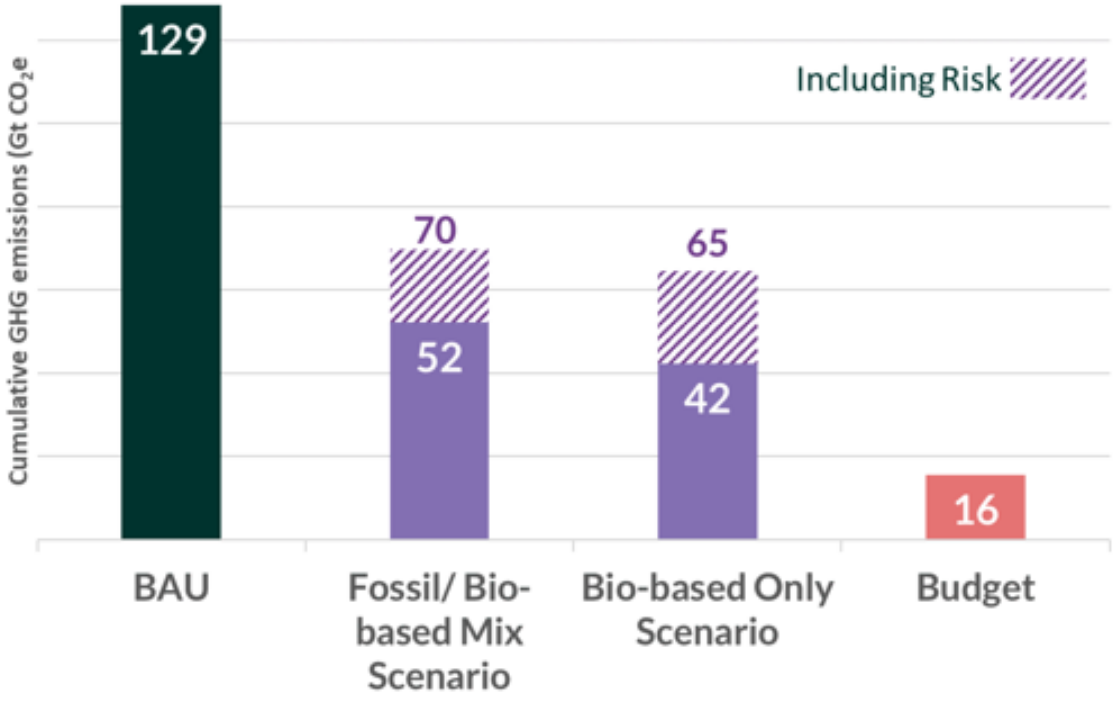
In an effort that goes beyond EPR but which is paramount for the success of a good resource management policy it is important to define the boundaries of the system in which EPR is to operate. So far, policies tend to regulate existing material flows but the implicit assumption is that resources are unlimited. The only way to ensure that reduction of environmental impact or pollution really happens is by ensuring that the use of resources and/or waste generation is either capped or reduced. In a scenario of capped or declining resource use, pollution or waste generation; any increase in collection and recycling will provide an absolute environmental benefit. In any other situation the benefit

of EPR and recycling will always be relative since plastic pollution will continue to increase in absolute terms.

Let's consider a scenario in which the global community decides to respect the climate agreement of staying under 1,5C warming. When it comes to plastic use the IPCC estimates that plastic production and management uses 2% of all CO2 eq emissions, that is 1,2Gt of the approximately 50 Gt of CO2 eq emitted yearly. Complying with the Paris Climate agreement means emitting a maximum of 400 Gt of CO2eq until 2050[20]. If the proportion of all materials used –cement, steel, copper, etc- would remain stable this would mean that the carbon budget for plastic production would be of around 16 Gt. For reference, without a cap on production and under current growth projection rates the plastic sector alone would consume 125Gt, more CO2 than the carbon budget available for the aluminum, cement and iron & steel combined.

If such a cap on plastic production would be imposed on, for instance 16Gt, the importance of EPR as a tool would grow exponentially since recycling would be a key way to access materials that otherwise today are too cheap to produce from fossil sources. It would also mean that non-recyclable polymers would automatically be either phased out or redesigned because the comparative cost of single-use unrecyclable plastic would be too expensive to use it only once or twice.

Figure 3-8: Plastics Decarbonisation Scenarios



[20] Is net zero enough for the materials sector? Eunomia, 2023

https://zerowasteeurope.eu/wp-content/uploads/2022/11/Is-Net-Zero-Enough-for-the-Materials-Sector-Report-1.pdf

Designing EPR systems with a clear perspective as to how much waste they are expected to manage, guarantees an overall positive environmental and financial outcome, allowing public authorities to control the power of PROs and ensure that the system will deliver in providing consumers with the right products within manageable material system boundaries.

On the other hand, producers might claim that such an approach curtails innovation and goes against the free market. However, any well-functioning free market operates within defined rules and boundaries and the fact that, so far, producers have been allowed to place in the market substantial amount of products using all kinds of recyclable, unrecyclable and even toxic materials without taking responsibility for the externalities is something that demands immediate action. The overstepping of most planetary boundaries and overconsumption of resources is a direct consequence of giving absolute freedom to companies to place an endless amount of products in the market. Freedom and innovation should be encouraged, provided they happen respecting planetary boundaries.

Prevention targets

Operating EPR systems that take into account planetary boundaries is the best way to guarantee that EPR contributes to waste prevention and to an overall positive environmental impact since the approach goes beyond a sector (i.e. it could address packaging and the content instead of only tackling packaging in isolation). Even if no consideration is given to planetary or system boundaries the policy makers can decide to impose a prevention target in order to stop and curb waste generation. For instance, article 38 of the Packaging and Packaging Waste Regulation approved by the EU in 2024 sets a waste prevention target for packaging of 5% by 2030, 10% by 2035 and 15% by 2040. It is important to note the nuance of targeting a sector –packaging- instead of a material –plastic- in order to prevent material substitution.

The EU as a whole and its member states individually are very good examples of the challenge of implementing EPR policies without capping or reducing the overall waste generation. The latest revision of the European packaging legislation is the first time that waste generation is legally contained which, if enforced, should allow EPR to have an overall positive environmental impact.

Other tools which can complement EPR systems are (sorted in terms of effectiveness):

Bans: Following the precedent set by African countries first with the ban on single use plastic bags, and later the more comprehensive Single Use Plastic Directive (SUPD) in the EU, the products that are highly littered, unrecyclable and for which alternatives exist it makes sense to consider banning them instead of setting up an EPR system. As a general principle, and in order to prevent lock-in situations it makes sense to consider bans before setting up EPR systems since many products or materials are better off replaced than having to manage them when there is no recycling technology or no secondary market for

the recyclate. For items such as fishing nets for which alternatives are hard to find, setting up an EPR system can make sense.

It is important that the bans are well designed and avoid loopholes as much as possible. For instance, partial bans such as bans based on the thickness of plastic bags can end up creating solutions that only make the problem worse if light-weight single-use bags are replaced with heavier "reusable bags" which are used only once[21].

Taxes and levies. The difference between a tax and levy is that, while funds raised through a tax must go into a central government spending reserve, funds raised through a levy can be ring-fenced for spending on specific concerns – as can funds raised through EPR fee payments. Taxes are more cumbersome and resource intensive to organise and operate than bans but can be a good complement to influence consumer and producer behavior and steer the market to more sustainable materials or products. For instance, in Ireland a levy on plastic bags of 0,15 EUR managed to reduce the use of plastic bags 40 times and raise 200 million euros in 10 years[22], much more effective than what an EPR system could have delivered in terms of waste prevention.

A ban on a material or product can also be understood as a tax set at an infinite level. Therefore, a good path towards a phase out which allows time for the alternative to scale up can be to set up a tax starting at a low level and which is increased over time.

EPR fee ecomodulation. There is some literature advocating for modulating the EPR fee that producers pay according to some sustainability criteria –recyclability, carbon footprint, etc- so that besides cost coverage, EPR systems can deliver an incentive for producers to improve the product design. This thinking was developed in the EU because taxation is not an EU competence and hence ecomodulation is a kind of camouflaged environmental tax implemented at national level. However, decades of experience in Europe have proven that for as long as EPR fees have to be limited to cost coverage, the price incentive that can be provided by EPR fee ecomodulation is insufficient to have significant impact on product design. Indeed, if the intention is to influence producer or consumer behavior a tax is probably a much better instrument than ecomodulating the EPR fees. Hence EPR roll-out at national level should consider taxes instead of ecomodulation. Ecomodulation only makes sense when taxation is not an option, but one should bear in mind that for it to have an impact on eco-design, EPR fees will need to go beyond cost-coverage.

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21 https://www.google.com/url?q=https://citizenmatters.in/plastic-pollution-solutions-beyond-bans-clean-ups-recycling/&sa=D&source=docs&ust=1721905258969512&usg=AOvVaw3YEtNJTL1tyCvoCLrxo5aT

22 https://ieep.eu/wp-content/uploads/2022/12/IE-Plastic-Bag-Levy-final-1-1.pdf

How to make ecomodulation deliver on cost coverage and eco-design

For those cases, such as in the European Union, where taxation cannot be implemented at EU level there is a way to make ecomodulation of EPR fees deliver on both cost coverage and eco-design and waste reduction.

The EPR system should include at least two variables upon which to set a fee for producers. One variable would be to implement cost-coverage and the other one to incentivise good design.

The first variable could be a fee –calculated by weight- paid by producers to compensate for the costs of collection and treatment of the product or packaging placed in the market. This variable is very much linked to the local conditions and hence it makes sense that it is set at national level since the cost of collection and treatment vary from country to country on the basis of several factors (transport distances, energy prices, labour costs...).

The second variable would serve the function of providing incentives for eco-design and would be set up on top of the costs of collection and treatment. Depending on the technical characteristics of the product or packaging such as recyclability, carbon footprint, litterability, etc the fee would be higher or lower. This second variable can be harmonised at supranational level thereby providing clear guidance for producers as to what is considered to be more or less sustainable and this way avoiding market fragmentation.

Subsidies. Some systems, especially when they don't have the competency of setting taxes or bans, may opt for subsidising the alternative to the product or packaging whose use we want to reduce. Subsidies can work in some circumstances but they have the disadvantage that the taxpayers have to pay twice. Let's imagine a municipality who decides to subsidise the implementation of a reuse system for take-away packaging, one one hand it has to use tax-payer money to cover the costs of clean-up and collection of single-use packaging for take-away and then use the tax-payer money to create the subsidy to pay for the reuse infrastructure. Moreover, there is the danger that the situation could go back to the initial situation when the subsidy is withdrawn.

Cap and trade. There is literature about the benefits of implementing a cap and trade system to use the market forces to reduce the environmental impact. However experience with projects such as the EU Emissions Trading System are living proof that these systems are slow in delivering environmental benefits and bans or taxes are a much better way to obtain results in the short term.

All in all, any existing or new EPR system that doesn't include any of these accompanying measures will not be able to reduce the absolute environmental impact of the system unless the reduction happens because of external factors such as economic or social downturn. The success of any future EPR system lies in the capacity to be implemented in coordination with other policy tools with a clear sense of direction of reducing the overall environmental impact.

6.2 Making EPR be a tool to increase/shift to reuse

Humankind has been operating reuse systems for over 5,000 years. Hence there is a lot of knowledge to build on, which means we don't necessarily need EPR in all reuse systems. To date, communities have self-organised to use bring-your-own reusable or biodegradable traditional single-use containers such as banana leaves that leave no waste behind and companies operated closed loop systems with returnable packaging in which, for economic reasons, they were applying what today we call individual producer responsibility.

However, many well-functioning reuse systems have been replaced by single-use systems which are operating –or expected to function in the future- with or within EPR systems. For instance, in the global north the traditional milkman with returnable glass bottles has been replaced with single-use packaging (carton beverages or plastic packaging) whose subsequent waste is managed by EPR systems. In the global south, single-use sachets are displacing more sustainable alternatives and there are plans to use EPR to manage this waste.

Advantages

Given the popularity of EPR, there is a natural tendency from producers and policy-makers to look at the tools available when time comes to address new opportunities. It is in this context that EPR, traditionally a waste management tool, has been considered in the field of reuse. There are several good reasons to use existing EPR systems to build and run infrastructure for reuse:

- They are already organising the financial contributions from producers,
- They normally have the operational and administrative infrastructure,
- They know the weaknesses of EPR for single-use and are well-placed to efficiently lead the shift to reuse,
- Since they are running the budget for single-use applications they can easily redirect part of this funding from single-use application to reuse infrastructure,
- If the governance and reporting work well it can help reduce administrative costs for the overall system.

France is one of the countries where more innovation has happened in the field of EPR with reuse. The anti-waste law in France (2020) [23] mandates EPR to play a role in waste prevention, concretely in pushing for eco-design, extending product life-span, reuse and repair. The system makes it possible, for instance, to finance a reduction of 50 euros in the costs of repairing a washing machine, the construction of a washing centre for returnable glass fruit juice bottles, or the compulsory return of a used sofa when buying a new one.

[23] https://www.ecologie.gouv.fr/loi-anti-gaspillage-economie-circulaire

One of the pioneers of this approach has been the main PRO for packaging in France, CITEO, which is mandated by the French government to implement the reuse goals of the anti-waste law of 2020. CITEO is a good example of how PROs, once created, can become a way for governments to externalise implementation, first of collection and later of reuse and other activities. Concretely the Anti-Waste French law sets the following reuse targets:

- *5% of the sales units in 2023 (for producers with more than 50 million in revenue), in 2025 (for producers with more than 20 million in revenue), in 2026 (for other producers with more than 10,000 sales units);*
- *10% of the sales units in 2027 for all producers (with more than 10,000 sales units);*
- A 20% reduction in single-use plastic packaging must be achieved by the end of 2025 (target in tons). At least half of this target must be met through reuse and recycling.

Interestingly, the law mandates PROs to dedicate the same percentage of its budget to reuse as the goal it is supposed to attain. As a result, in 2024 CITEO invested more than 50 million euros (which is 5% of its annual budget) into reuse infrastructure[24]. This budget is to double in the coming years to attain the 2027 targets of 10% reusable packaging. The French example draws on one of the key learnings of the success of EPR and waste management over the last decades; that is that without funding for infrastructure any targets –be it recycling or reuse- remain elusive. It also sets an interesting precedent for other fields; for instance setting a polluter pays fee on fossil fuels and using it to finance transition to renewable energies.

Another key positive feature of the French initiative is to set reuse targets for all primary packaging (regardless of the material), as it prevents material substitution, which would cancel any positive impact of the measure. In contrast, the Indian EPR guidelines[25] propose to incentivize reuse by setting reuse targets on rigid plastic but not for other plastic formats or materials. The result of such policies are likely to lead to either material substitution (for instance single-use tin or glass, which have higher carbon footprint) or moving from a more recyclable polymer (rigid plastic) to a less recyclable one (multilayered flexible plastic packaging).

The recently approved European Packaging and Packaging Waste Regulation also hints at the responsibility of PROs in financing reuse infrastructure (art 51(3)) "Member States shall ensure that extended producer responsibility schemes and deposit systems dedicate a minimum share of their budget to financing reduction and prevention actions". However such a wording could also be interpreted as a way for PROs to invest only in lightweighting of packaging which does indeed reduce the waste tonnage but increase the litterability and make reuse and recycling activities more challenging.

Challenges

[24] https://www.citeo.com/le-mag/reuse-imaginer-aujourdhui-le-dispositif-de-reemploi-de-demain
[25] Page 27 of https://cpcb.nic.in/uploads/plasticwaste/PWM-Amendment-Rules-2022.pdf

Having PROs play an active role in the financing, design and operationalization of the transition to reuse has advantages but also presents challenges. For instance, in the French example there is no transparency as to how the budget is allocated and the funding mostly goes to brands who are members of CITEO whereas the nascent reuse industry in the country got almost no funding. It is important to note that all the infrastructure considered is private infrastructure. Hence, if PROs are to use their budget, made up of EPR fees (paid by producers of single-use packaging), to finance the reuse infrastructure necessary to attain the targets set by law, some questions arise:

- Who should define the principles and conditions for the allocation of the funds?
- Who should decide on the allocation of the funding? How to deal with the conflict of interest of having a body which works for and is paid by producers getting to approve funding to their own members apply for?
- How to ensure the system is transparent and fair?
- Does it make sense that PROs whose business model thrives in a linear economy are charged with the responsibility of developing a circular economy which, if successful, might end up undermining its current raison d'etre?
- Is it better to create new PROs dealing exclusively with reuse?
- Or should the funding be paid by the PRO but the definition of criteria and decision on the allocation of the funds should be a responsibility of the environmental agency?

Given the novelty of the initiative to finance reuse infrastructure with EPR fees, there aren't other case studies to compare the application of this approach and this is something that deserves further research. What is undeniable is that in 2024 France is the country worldwide with the biggest investment in reuse infrastructure and this is thanks to the funding originating from EPR fees. Two considerations on this topic; firstly, 50 million euros in 2024 and 100 million euros in 2025 are important amounts and yet rather small in comparison with the budget spent to manage single-use packaging which in France is of the order of 1000 millions per year. For the sake of comparison, European plastic manufacturers will invest 2,6 billion euros in 2025 in chemical recycling which if allocated proportionally in Europe would amount to an investment of 390 million euros in France alone[26]. That is 8 times more investment in an unproven highly risky technology than on a proven system which, according to the waste hierarchy, should have priority.

Secondly, the use of EPR fee to finance private reuse infrastructure could also be organised as a tax on single-use packaging whose revenue could be used to build public infrastructure for reuse –even if it is privately operated- which would have the advantage of providing more accountability and transparency on the process and ensure that the reuse infrastructure is defined by public bodies instead of producers with a vested

[26] https://plasticseurope.org/media/european-plastics-manufacturers-plan-7-2-billion-euros-of-investment-in-chemical-recycling-2/

interest in the continuation of single-use packaging market. This issue goes back to the structuring of the operationalization of EPR systems; in Europe it is normally the local authorities who organise the collection whereas producers pay for the costs and intervene at the sorting and/or recycling stage. It makes sense that reuse infrastructure follows a certain approach that makes it recognizable and interoperable beyond local level and this requires some sort of coordination of local authorities under the guidance of the national or supranational bodies. Hence, the revenues of such a tax could also be used to set-up a new PRO charged with implementation of the reuse transition with the involvement of local authorities, brands and other players. This alternative governance approach, in contrast with current PROs which are completely controlled by brands, could provide better governance and oversight as well as serve a public good purpose, instead of only focusing on maximising economic efficiency by externalising costs on society.

The question on the ownership and the management of the reuse infrastructure is a very relevant one. For closed-loop pool systems for alcoholic or soft-drink producers where they circulate packaging between them and the retailers it makes sense that it is privately owned and privately managed. However there are situations in which publicly owned and /or managed infrastructure might make sense. For instance, for the collection of packaging for take-away which might happen in public spaces or for the creation of distribution hubs or washing centers for standardized reusable packaging which can be used by different restaurants, hotels or public markets, it can make sense to have the public authority play a role. Normally it doesn't make sense for a municipality –unless it is big enough to generate the right economies of scale- to build the reuse infrastructure on its own. Upscaled washing plants and collection rounds can serve several municipalities at the same time reducing unit costs. Both pool systems and locally run reuse infrastructure would normally happen outside the EPR system but, when necessary, PROs can play a role in facilitating, financing or helping to set up these systems.

Likewise, DRS systems for reusable packaging are well developed in Europe and function as individual EPR systems, many of them run as private pool systems, separate from other packaging.

Pool systems[27]
Within the reusable packaging world, there are three types of systems:

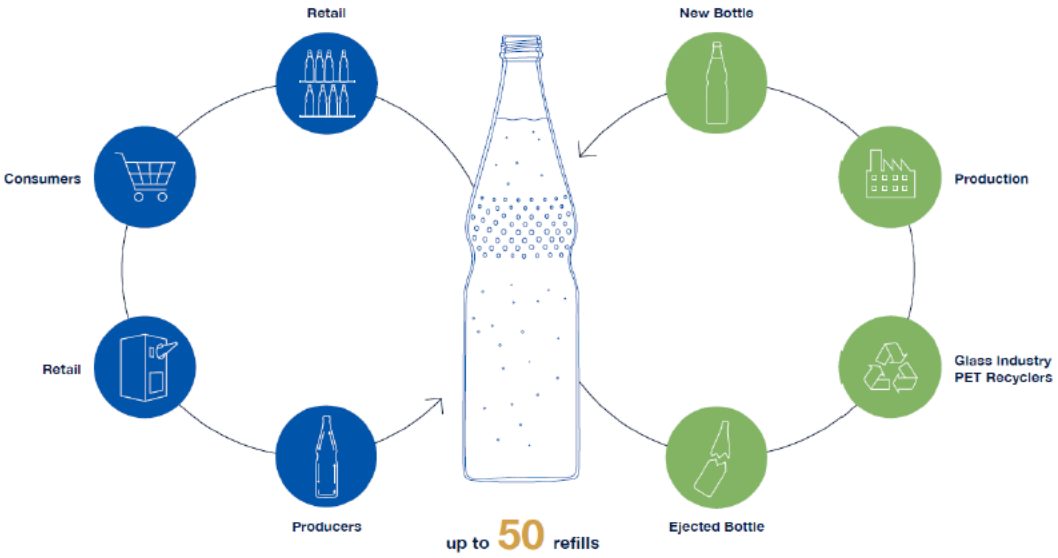
- Managed pool systems: These are systems defined by a central organisation in charge of organising and monitoring a shared system of packaging.
- Unmanaged pool systems: These are systems that use some sort of standardised system or packaging but without central governance.
- Individual systems: These are reuse systems set up and run by one single company for their own packaging.

A managed pool system is a packaging system consisting of one (or several) defined primary – and, if
required, secondary – "return from home" or "return on the go " containers that are:

[27] The need to set essential criteria for setting up managed pool systems, 2022

● Jointly used (“shared”) by a defined set of producers/packers either on a regional, national or
cross-border/European level;
● Working with an institutionalised governance structure;
● Comprised by a set of standards and rules, the basis of which guarantees the free movement
of the packaging among all pool participants (producers/packers) and relevant stakeholders (e.g. trade).

Example: Genossenschaft Deutscher Brunnen eG (www.gdb.de) is a managed pool system in Germany operating a managed pool system since 1969 circulating over 1 billion glass or PET bottles.



There isn’t one way to run reuse systems and it is the local circumstances which should inform the best organisational arrangement. In either case when designing or legislating on EPR for reuse it is important to differentiate between those reuse systems that can operate within EPR systems and those which shouldn’t.

For products sold in bulk, such as locally produced items sold in public markets, the authorities should intervene to ensure the right reuse systems and infrastructure are in place and brands and PROs should not have more power than others in deciding how this will work. For instance, for distribution of local products produced in isolated places; where waste management is costly and traditional systems are capable of delivering goods without packaging, it makes sense to prioritise prevention via ‘bring your own

containers' or the use of traditional biodegradable containers[28] and ban the distribution of products in packaging which cannot be collected or managed locally. It is important to note that in many countries 'bringing your own containers' and other traditional packaging systems is either not legally permitted or directly prohibited, normally on the basis of hygiene considerations. Hence, complementary legislation defining when can 'bring-your-own containers' for refill be used is all that is needed.

For products currently sold pre-packaged but for which no viable recycling option exists, whereas there is potential to move to refill or reuse options, authorities should design a transition path whereby the EPR system has a concrete plan to transition out of single-use packaging. For instance, most single-use multilayered sachets are not economically recyclable and are highly littered, plus alternatives to deliver most of the products in refillable dispensers exist and are cheaper for the consumer and the retailer as it is proven by Greenpeace in the Quezon City[29]. In this case, a progressive phase out of sachets and transition to refill systems can be facilitated by an EPR system which charges producers for the clean-up costs and the setting up of the refill infrastructure but with a clear mandate to stop operating once the system has phased out sachets. The same phase-out of sachets for concrete applications can happen without EPR but in that event the clean-up costs would need to be borne by the community.

Reuse VS Refill systems

The general reuse terminology is not yet set in stone and the global plastic treaty negotiations might provide some guidance as to how to approach different types of reuse. Based on the already approved terminology in the Packaging and Packaging Waste Regulation in the EU, a way to differentiate the different types of reuse is based on the ownership of the packaging and existence of reverse logistics and incentives for returning the product/packaging. It is important to differentiate between the action of reuse vs the system of reuse and the system of reuse vs the action of refill. The EU legislation uses the following definitions:

(22) ***'re-use'*** *means any operation by which reusable packaging is used again multiple times for the same purpose for which it was conceived;*

(26) ***'systems for re-use'*** *means organisational, technical or financial arrangements, together with incentives, that allow the re-use either in a closed loop or open loop system. It includes deposit and return systems, when they ensure that packaging is collected for re-use*

[28] By traditional biodegradable packaging and products we refer to items such as banana leaves or coconut shells and not industrially produced biodegradable packaging such as biodegradable bags or paper-based single-use containers which require specific controlled waste management plants to ensure its proper biodegradability

[29] https://media.greenpeace.org/archive/Kuha-sa-Tingi-Report-Launch-in-Quezon-City-27MZIFJBDG1MO.html

*(28) **'refill'** means an operation by which a container, owned by the end user, which fulfils the packaging function, or a container purchased by the end user at the point of sale of the final distributor is filled by the end user or by the final distributor with a product or several products purchased by the end user from the final distributor;*

For products currently sold prepackaged and which, for any good reason, it makes sense to continue to be sold prepackaged, the brands should pay for the costs of collection and treatment for both single-use and reuse with a clear transition to shift from the former to the latter when this makes environmental sense[30].

In these situations, it is preferable to have the regulation mandate producers to change their delivery systems instead of including the single-use and/or reusable packaging in the EPR scheme. PROs can play a useful role in helping set up pool systems in which several producers get to commonly manage the collection, handling, washing and refilling of their products, but these pool systems should be allowed to operate outside the EPR system. However, having packaging leave the EPR system to be managed in pool systems means less economic activity for the PRO which can be a problem in those cases in which PROs put defending their economic interests before the collective environmental goals.

All in all, and given their expertise, PROs can play a role in facilitating the transition from single-use to reuse provided there is a good regulatory framework defining their role and targets as well as a proper oversight on their operations. In places where EPR is not yet in place and where PROs have not yet been created it may make sense that these facilitation skills (from single-use to reuse systems) are built within the community or in the public administration which are likely to have less of a conflict of interest in the transition.

6.3 Making EPR contribute to a just transition

Just transition is a term, which can have a wide scope depending on whether the transition is for the waste workers or for society as a whole. In the context of plastic pollution, just transition is a concept which was developed by representatives of the waste pickers movement to describe how the transition should take into account those impacted by the change in waste management practices. It involves maximising the social and economic opportunities of ending plastic pollution while minimising and carefully managing any challenges – including through effective social dialogue among all groups impacted, and respect for fundamental human rights.

In principle, EPR fees paid by producers should cover the costs of administration, communication, collection and treatment of waste. However, whilst in the global north the law stipulates that EPR fees should pay for the service of collection and treatment of (most of) the waste they place in the market, in the global south legislation is, at best, unclear, and the costs covered with EPR fees are minimal. As a result, wastepickers have

[30] Reducing packaging waste: choose prevention and reuse, 2022

to continue to rely on the market prices of the recyclables and the only way the goal of collecting all waste will be achieved is if the municipality covers the funding gap (which can represent more than 80% of waste management costs). This explains why so much waste escapes into the environment; the economics are not there for waste to be collected.

In the global south the transition from a "Cash for trash" system in which waste pickers revenues depend on the value of the recyclables to a proper EPR system is slow and not homogeneous. Indeed, a common feature of all EPR systems in the global south is that the EPR fees are either not compulsory or cover only a little fraction of the costs and, as such, it is hard to consider that compensation as equivalent to a service fee. As a consequence, waste pickers continue to depend on the selling of recyclables for a big part of their income and hence the viability of the system depends on the fluctuations of the market prices for recyclates. Since one of the keys for the credibility of EPR to work is that all waste should be collected, the current EPR systems operating below cost are leaving the less valuable materials excluded from the collection.

There are three main issues with having the business model of EPR systems be linked to the market price of recyclables:

- The price fluctuation of materials creates a situation which is socially unjust because many livelihoods which are providing an environmental service are depending on the market to deliver this social good.
- In turn, this price fluctuation puts the wider common good at risk since it doesn't guarantee waste collection and undermines the credibility of EPR because a big amount of waste will not be collected.
- Bargaining power: not all waste workers have the same level of organisation and hence they will get different deals in different places depending on their bargaining power. If the service is recognized there should be a minimum income and benefits for anyone delivering the service.

A big amount of the waste doesn't have enough material value to act as a driver for waste pickers to collect it; sachets, nappies, hygiene items or medical waste are just some examples. Given the low unitary material value of these waste streams and their very costly –or economically unviable- end-of-life treatment they will only be collected if the brands pay for a service that otherwise will not happen.

In a situation similar to what Europe experienced in the 1980s and 1990s, municipalities just can't afford to shoulder the costs of increasing volumes and complexity of waste placed in the market and the only way to ensure waste is collected is to pay a proper service fee, articulated via an EPR system. There isn't much literature as to what a proper service fee for wastepickers would be. We believe such a fee should, as a minimum:

- Provide decent living conditions to waste workers including training, advice , information, high safety and welfare standards
- Pay for the necessary infrastructure for collection, sorting and recycling

- Cover the costs of nationwide collection of all the waste from the specific stream covered by EPR
- Ensure that the management of financial flows is transparent

On top of these conditions it makes sense that those who collect the waste have a say on whether they want to keep the right to sell the recyclables themselves. Many EPR systems remove this right from the entities collecting the waste and, whereas this can make sense if a proper arrangement is found regarding the EPR fee, those who collect the waste should have the last word.

6.4 Building effective governance for EPR

The capacity for EPR to contribute to reduce the environmental impact and advance the circular economy and just transition depends on whether it is accompanied with:

- concrete policies mandating the stabilisation or reduction of waste generation for the concrete waste stream,
- eco-design, reuse and repair policies ensure that materials will keep its value for as long as possible before recurring to recycling and
- legislation clearly defining the role and the remuneration for the work of waste pickers, enabling a just transition.

In the event of EPR being proposed accompanied with the above-mentioned characteristics it is important that the law clearly defines what the EPR system is and what its role should be. Concretely it should define:

- The scope of the instrument - what concrete waste stream does it cover
- Definitions - clear description of the topics addressed by the EPR system so that the subjects can be allocated concrete responsibilities
- Financial and operational obligations - which entities carry an obligation and the extent of this obligation
- Targets - general targets and specific targets for prevention, reuse, recycling, etc
- Means of demonstrating compliance
- Any possible exemptions - for very concrete situations, items or producers. Watch for exemptions so big which can turn into legal loopholes which will make the system ineffective

The last but very crucial aspect of a well-designed EPR system is to set the right governance in place to ensure that EPR works properly and in a transparent manner to avoid that the PRO gets a life of its own and starts pursuing its own political agenda.

One of the most recurrent topics with developed EPR systems is how their governance and set up prevent transparency and proper auditing of the system. This can lead to

situations in which PROs end up obstructing access to data or spending funds that were meant to inform citizens, to manipulate the public opinion or report untruthful data. These situations reveal that the government has devolved so much power to PROs that makes it very hard to monitor the real situation and prevent the possibility of intervening badly working EPR systems.

For instance in Spain, the Spanish PRO for lightweight packaging, Ecoembes, has been reporting data which according to many stakeholders doesn't correspond to reality. The Spanish waste law stipulates that if collection rates for lightweight packaging don't meet the 70% target by 2023 the country has to implement a DRS system. Without changing much in the system, in 2024 the PRO suddenly reported 71% collection rate when according to independent studies the real rate is 36%[31]. The reaction of the PRO was to blame the Spanish Environment Ministry when the ministry didn't have the means to monitor neither the collection rates nor the functioning of the PRO. Situations like these in which the PRO has more information and funding than the ministry should be avoided.

In order to guarantee that EPR systems can deliver on the mission they have received from the public authorities it is important that:

- the governance of EPR systems is designed to prevent the use of strategic position to influence the institutions from which they receive the mandate,
- PROs can contribute with technical knowledge but should not be allowed to politically influence processes where they have a conflict of interest. Such as setting up a DRS system or development of reuse infrastructure,
- The governance structure of PROs ensures that stakeholders such as governments, environmental organizations, and waste processors are included in a democratic and transparent way in policy processes, the set up of contracts and fees, and decisions on strategy (such as efforts to increase circularity),
- National governments/ministries design stringent, transparent criteria allowing them and public opinion to monitor the governance and data reporting from PROs,
- Discourage any attempts from PROs to shift blame or responsibility for (litter) waste onto consumers.

These measures are applicable to existing EPR systems, however, given the difficulty to change PROs once they have been constituted, an important lesson for new EPR systems is to ensure that the system is well planned from the beginning. For instance, any new EPR system should look into developing prevention and reuse systems and highly performing collection systems such as DRS before setting up the system for single-use. Like this, it can prevent tensions and delays in delivering the best environmental and economic options.

31 https://zerowasteeurope.eu/library/analysis-of-the-separate-collection-rate-of-plastic-beverage-bottles-up-to-three-litres-in-spain/

7. CONCLUSION

EPR has proven to be a useful tool for mobilising resources to manage waste when the legislation provides the right guidance, but its potential remains largely untapped. This study provided proof that the use of EPR during the last decades has not prevented the increase in waste generation, it has not supported reuse -in most cases it has undermined reuse options- and, with the partial exception of the EU, it has not made producers really responsible for the products and packaging they place in the market. In terms of fostering ecodesign, EPR has so far not managed to increase the recyclability or circularity of products or packaging as they have increased in variety and complexity. The way EPR is functioning today and/or the way it is being rolled-out in new countries, it is unlikely that EPR will manage to reduce waste generation, increase circularity -reusability or/and recyclability-, substantially increase capture rates or provide a just transition for waste workers.

However, EPR remains a powerful tool which, if properly used, could help address the triple planetary crisis and ensure a just transition. In order to do that EPR must evolve beyond its current limitations and become a piece of a wider policy framework whose focus looks beyond waste management to be included in a more holistic resource management strategy.

This wider resource management strategy aims not only at reducing littering but rather at delivering absolute environmental benefits and, as such, it includes caps or reduction targets for resource use and waste generation. This strategy complements EPR with proper ecodesign incentives in the shape of essential requirements and fiscal measures. Unnecessary, unrecyclable or toxic products or materials are intentionally targeted and phased out with bans or taxes (which increase over time) instead of becoming institutionalised in waste management systems.

This strategy clearly charges producers with the responsibility of delivering products and packaging which maximise value retention and minimise externalisation of costs via obligations to finance reuse and repair and make these operations cheaper for consumers than buying a new item. As part of this responsibility, producers are required to prioritise high-performing collection systems like Deposit Return Schemes (DRS) for concrete streams from the outset, avoiding entrenched interests that hinder progress.

Within this strategy, EPR systems are designed with governance structures that prevent power abuse and ensure transparency, including stakeholder participation and stringent monitoring criteria. This transparency and involvement of stakeholders allow for fair compensation for waste workers, particularly in the global south, by clearly defining responsibilities and costs covered by EPR fees.

All in all, in these times in which EPR seems to be presented as the solution to building badly needed waste infrastructure across the globe, this study is a call to those in positions of power to take note of the learnings from the last decades and build EPR to deliver on the highest challenges for today's civilisation that is to make humanity thrive within planetary boundaries.

Perhaps **the most important learning of all is that the future of EPR lies not in perpetuating waste management, but in catalyzing a systemic shift towards resource efficiency and just transition.** By addressing these critical aspects, EPR can become a cornerstone of sustainable development, driving innovation, creating green jobs, and significantly reducing environmental impacts.

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8. GLOSSARY OF TERMS AND ACRONYMS

EPR: Extended Producer Responsibility - A policy approach where producers are given significant responsibility for the treatment or disposal of post-consumer products.

PRO: Producer Responsibility Organization - An entity set up to implement EPR on behalf of multiple producers.

DRS: Deposit Return System - A system where consumers pay a small deposit when purchasing a product, which is refunded when they return the empty container.

Circular Economy: An economic system aimed at eliminating waste and preserving the value of materials over time.

Just Transition: Ensuring that the shift towards environmentally sustainable economies and societies is as fair and inclusive.

Waste Hierarchy: A ranking of waste management options according to what is best for the environment. The order of priority is: prevention, reuse, recycling, and disposal.

Eco-modulation: Adjusting EPR fees based on environmental criteria of products.

Waste Picker: An individual who collects reusable and recyclable materials.

Single-use Packaging: Packaging designed to be used only once before being disposed of or recycled.

Reusable Packaging: Packaging which has been designed to accomplish multiple trips and uses.

PPWD: Packaging and Packaging Waste Directive - EU legislation aimed at harmonising national measures concerning the management of packaging and packaging waste.

PPWR: Packaging and Packaging Waste Regulation – EU legislation on packaging and packaging waste that replaces the PPWD as from 2024.

SUPD: Single-Use Plastics Directive - EU directive aimed at reducing the impact of certain plastic products on the environment.

Ecodesign: An approach to designing products with special consideration for the environmental impacts during its whole lifecycle.

Pool System: A shared system for reusable packaging.

OECD: Organisation for Economic Co-operation and Development - An intergovernmental economic organisation with 38 member countries.

PPP: Polluter Pays Principle - The principle that those who produce pollution should bear the costs of managing it to prevent damage to human health or the environment.

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