European Plastics Pact

Extended Producer Responsibility (EPR) in Review: A summary of key literature on the advantages, disadvantages, opportunities and limitations of EPR

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Introduction

The European Plastics Pact has four targets which it aims to achieve by 2025. The targets and planned pathways for their delivery are outlined in the European Plastics Pact Roadmap.
The following report supports Target 3: Collections, sorting and recycling.

This report is intended to assist policy makers and businesses alike when considering Extended Producer Responsibility (EPR) policies and how it might impact efforts to increase the recycling of plastics in Europe. It is designed to act as supporting guidance with points to consider, rather than providing specific principles or policies to follow when creating EPR schemes.

EPR is a policy framework that aims to move the financial stewardship of recycling away from municipalities and instead put it on the producers of plastic packaging, with the intention of increasing the funding and efficiency of recycling (WWF, 2022).

This report summarises key points discussed in notable academic and intergovernmental reviews conducted on the successes, limitations, and opportunities for improvement regarding extended producer responsibility (EPR). Any opinions noted in this document are not that of WRAP or the European Plastic Pact but belong to the author(s) and institutions referenced. A bibliography and further reading list is available at the end of this resource.

Introduction to EPR

Extended Producer Responsibility (EPR) is a policy that mandates manufacturers to take responsibility for the proper disposal of their products once they reach the end of their useful life.

This policy has been implemented in many countries worldwide, particularly for plastic waste management. Ellen MacArthur Foundation (2016) found that EPR has led to significant increases in plastic packaging recycling rates in some EU Member States, such as Belgium and Germany.

While EPR has many benefits for plastic waste in the EU, it also poses challenges. Europen (2013) highlight that significant changes have taken place in the regulatory and market environment since 1994, some leading to divergent practices undermining the recovery and recycling performance of packaging. Challenges include differences in EPR practices resulting from Member State implementation of the Plastic Packaging Waste Directive, and a lack of consistency and enforcement of compliance obligations in national packaging and packaging waste legislation.

As numerous reviews have been conducted on EPR policies to assess their advantages, limitations, and possible best practices, the key arguments from these have been collated into this single resource to provide a quick and easily digestible summary of some of the key arguments surrounding EPR.

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EPR in Europe

European Context

Despite common EU Directives, the implementation of EPR has varied widely across Europe. The form of EPR implementation within the EU is member state specific and varies from mandatory regulations to voluntary agreements between governments and producers and voluntary industry initiatives. Differing approaches are evident across all member states with respect to the role played by local authorities, responsibility apportioned to them, and the evolution of working relationships between obligated producers and municipalities.

The Packaging and Packaging Waste Directive has been introduced by the EU with the aim of harmonising EPR regulations across the continent. The directive requires Member States to set up systems for the return and/or collection and reuse or recovery (including recycling) of used packaging from the consumer in order to meet the EU recycling targets. The Packaging and Packaging Waste Directive obliges all Member States to set EPR schemes for packaging by 2024.

The Waste Framework Directive has introduced general minimum requirements to improve harmonisation, increase transparency, cost-efficiency, accountability and better enforcement of EPR obligations at national level. Under the new rules, eco-modulation of EPR fees has become mandatory with a view to boost recyclability.

For further information, view Europen's factsheet on EPR.

Plastic Packaging Waste Framework Directive

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The directive sets out the following targets:

By 31 December 2025, at least **65%** by weight of **all packaging waste** must be recycled. The recycling targets for plastic are:

- **50% of plastic**

By 31 December 2030, at least **70%** by weight of **all packaging waste** must be recycled. This includes:

- **55% of plastic**

View the directive here for further detail on legislation.

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Harmonisation of EPR in Europe

Harmonisation of EPR

Why does the European Waste Directive call for harmonisation?

The lack of harmonization in EPR implementation across EU member states is one of the key challenges discussed across many academic papers and reviews of EPR. While the EU has established a framework for EPR, implementation remains the responsibility of individual member states. As a result, there are significant variations in the way EPR is implemented across different countries, which can make it difficult to establish common goals and standards.

Pouikli (2020) discusses how some member states have very broad EPR programs that cover a wide range of products and materials, while others have more limited programs that only cover certain types of products or materials. In addition, the level of financial responsibility placed on producers can vary widely, with some countries placing a much higher burden on producers than others. This lack of harmonization can create significant challenges for producers, who may need to comply with different EPR requirements in different countries. It can also create challenges for waste management companies, which may need to operate in different regulatory environments in different countries. However, the lack of harmonization also presents an opportunity for member states to learn from each other and to develop best practices for EPR implementation that can be shared across the EU.

Harmonisation of EPR

The European Commission (2014) believe that the benefits of a harmonised EPR scheme are far-reaching, and among the others, would enable companies to consistently make more sustainable product design choices; allow the scaling up of waste collection making it faster and more efficient; incentivise setting up more effective flows of 'post-consumer wastes' and the 'capital needed to establish infrastructures' across the EU; reduce the costs of recirculation of materials and resources, and help to establish transparent and uniform reporting requirements on waste and resource flows across the EU creating traceability and transparency.

They state that left unharmonized, EPR rules would create a risk of market fragmentation of national waste management systems, which could further delay the development of circular textiles, apparel, and footwear products in the EU. Furthermore, the above-listed benefits of harmonised EPR would be lost.

Harmonisation of EPR

The European Commission (2014) highlighted that it is not possible to check whether targets are actually reached without publication of proper data. Optimal transparency can only be reached through harmonisation of calculation rules and reporting procedures. Currently, a considerable part of the data is not available. Better data is needed for all stakeholders and for future decision-making. The reporting format for all PROs (independently of stream or country) should be homogenised to obtain reliable and comparable data. The commission call to ensure data availability, especially when several PROs are in competition and ensure materials' traceability. Furthermore, they suggest the following design features of EPR are the most important aspects to be carefully thought through and thus would benefit from being harmonised:

- Scope:
  - Household/commercial and industrial waste, products covered, separately collected and residual fraction, etc.;
  - Targets (i.e. definition of 'recycling' and 'recovery');
  - Qualitative aspects (not only quantities reached, but also degrees of quality achieved);
  - Reporting obligations (frequency);
  - Statistics.
- Define precisely data collection and reporting methods, e.g. Quantities put on the market and arising waste; Recycling rates; Costs and the link with producers fees.

Harmonisation of EPR

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At present, there is a lack of harmonisation among EU Member States regarding the key definitions and reporting modalities that can be used to monitor the performance of EPR schemes. In 2014 the European Commission identified the issue of data validation as a key challenge at national and EU levels, stating this makes performance comparisons difficult. Standards for the following should be defined and harmonised at the EU level:

- Key definitions:
  - Treatment operations – recycling, recovery (based on the Waste Framework Directive);
  - Products and waste categories – household, municipal, industrial, commercial, professional, post-consumer, etc.)
- Reporting modalities, including:
  - Scope, Data collection methods, Calculation modes, Validation methods, Frequency of updates.
- Public authorities should perform a more thorough quality check on provided data in order to facilitate performance benchmarking, sharing of best practices, and continuous improvement of EPR schemes. The European Commission could develop and propose a set of common definitions and reporting modalities, to be applied by Member States once they are available.

Harmonisation of EPR

Moreover, there is member support for increased harmonisation. In 2021 The Policy Hub together with Circle Economy, Euratex, EuRIC, EuroCommerce, Government of Catalonia, and the Municipality of Milan sent a letter to the European Commission asking for EU-harmonised rules for EPR.

The letter outlines their desire for increased harmonisation to avoid market fragmentation as well as incentivise setting up more effective flows of 'post-consumer wastes' and the 'capital needed to establish infrastructures' across the EU; reduce the costs of recirculation of materials and resources, and help to establish transparent and uniform reporting requirements on waste and resource flows across the EU creating traceability and transparency – prerequisites for a safe circular system.

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EPR in Review: Benefits and Limitations

Benefits and Limitations of EPR

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It is important for policymakers to consider both the benefits and limitations of EPR when designing waste management policies.

EPR can be an effective tool for increasing recycling rates, improving product design, and reducing waste management costs, but it also has potential drawbacks that need to be carefully considered and managed.

Policymakers should carefully evaluate the costs and benefits of EPR and consider how to best design the policy to ensure it reaches its desired outcome of increasing recycling, collections and circularity.

Benefits of EPR

Increasing Recycling and Collection Rates

Increased collection and recycling rates: By providing financial incentives for proper waste management, EPR can lead to increased recycling and collection rates of products covered under the scheme (Ahlers *et al.*, 2021). By placing the responsibility for end-of-life product management on producers, EPR creates a financial incentive for them to develop recycling systems that are more **efficient and effective** (Campbell-Johnston *et al.*, 2021). Policymakers can design EPR schemes that encourage the adoption of sustainable practices and ensure that the costs of waste management are properly allocated.

Recycling and collection rates can further be improved through EPR by incentivising **design of products that are easier to recycle.** By internalizing the costs of end-of-life product management, EPR may be able to incentivise producers to design products that are more sustainable and easier to recycle, repair, or reuse. Policymakers can leverage this incentive by setting up EPR schemes that are designed to reward producers who adopt sustainable practices and penalize those who do not.

Benefits of EPR

Improved Efficiency

- **EPR can improve waste management efficiency**: EPR can improve the efficiency of waste management by shifting the burden of waste management from local authorities to producers. This can free up resources for local authorities, allowing them to focus on other areas such as infrastructure, education, and healthcare. Policymakers can design EPR schemes that encourage producers to minimize waste and maximize recycling, while also ensuring that the cost of waste management is not passed onto consumers (Ahlers *et al.*, 2021).

- **Reduced waste management costs for local authorities**: EPR can help to reduce the costs of waste management for local authorities. By shifting responsibility for end-of-life product management from local authorities to producers, EPR can reduce the amount of waste that needs to be managed by local authorities and the associated costs (Campbell-Johnston *et al.*, 2021).

Benefits of EPR

Transparency and accountability

- **Increased transparency and accountability:** EPR can improve the transparency and accountability of the waste management system. By requiring producers to report on their recycling rates and other metrics, EPR creates a level of transparency that can help to identify areas for improvement and hold producers accountable for their environmental performance (Campbell-Johnston *et al.*, 2021).

Limitations

- **Increased costs for producers**: EPR can increase the costs of production for producers, particularly for smaller producers who may not have the resources to develop recycling systems and infrastructure. This can make it more difficult for small producers to compete in the market (Campbell-Johnston *et al.*, 2021).

- **EPR can create administrative and regulatory burdens:** EPR can increase the administrative burden on producers, particularly for those who operate in multiple jurisdictions with different EPR schemes. EPR schemes require significant administrative and regulatory oversight, which can be a burden for both producers and local authorities. This can create inefficiencies and increase costs for producers (Campbell-Johnston *et al.*, 2021). Policymakers must carefully balance the benefits of EPR with the costs of implementing and managing such schemes, and ensure that they are designed in a way that minimizes administrative burdens (Ahlers *et al.*, 2021).

Limitations

- **Difficulty in setting targets:** It can be difficult to set targets for EPR schemes that are both ambitious and realistic. If targets are set too high, producers may not be able to meet them, which can lead to non-compliance and associated penalties. If targets are set too low, the environmental benefits of the scheme may be limited (Campbell-Johnston *et al.*, 2021).
- **EPR can lead to higher product costs:** EPR schemes can result in higher product costs, as producers pass on the costs of waste management to consumers. Policymakers must ensure that the costs of waste management are not unduly burdensome on consumers, and that EPR schemes are designed to be as cost-effective as possible (Ahlers *et al.*, 2021).

Limitations

- **Risk of some producers not taking full responsibility:** Due to financial and administrative burdens associated with EPR, some producers may not comply with the scheme and instead rely on others to bear the costs of end-of-life product management. This can create an uneven playing field and undermine the effectiveness of the scheme (Campbell-Johnston *et al.*, 2021).

- **EPR can be difficult to implement and enforce:** EPR schemes require cooperation and coordination among producers, local authorities, and waste management companies. Policymakers must ensure that EPR schemes are designed in a way that is practical and feasible, and that they provide adequate resources for enforcement and oversight. Policymakers must also ensure that the penalties for non-compliance are sufficiently strong to incentivize producers to comply with the EPR scheme (Ahlers *et al.*, 2021).

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EPR Policy Design Overview

Policy Design Overview

The text discusses the importance of defining the responsibilities and roles of all actors involved in an EPR scheme, including producers, consumers, local authorities, waste management companies, and others. A successful EPR scheme requires each stakeholder's contribution towards a common goal, and precise roles should be defined at the national level in accordance with financial and operational obligations. Effective EPR policy should also be associated with other economic instruments, such as landfill taxes and Pay-As-You-Throw systems, to encourage behavioural change. Multi-stakeholder platforms should be encouraged to ensure dialogue among stakeholders.

The text emphasizes that EPR schemes are most effective when there is a clear and shared understanding among all actors about their respective roles and responsibilities throughout the product life cycle. It is also important to note that EPR policies should be tailored to the specific context and characteristics of each country or region, rather than being a "one size fits all" solution. Finally, multi-stakeholder platforms can play a crucial role in ensuring effective communication and coordination among stakeholders, as well as fostering innovation and collaboration to improve the performance and cost-effectiveness of EPR systems.

Development of Guidance on Extended Producer Responsibility (EPR) (europa.eu)

Policy Design Overview

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Environmental consultants Adelphi undertook research in 2021 to better understand the conditions in which EPR systems can perform well and deliver the best results, by analysing the performance of different EPR schemes in Europe and the EU. Its findings are based on an in-depth assessment of **6 case studies**, supported by results from a **literature review**, **interviews with industry experts** and **focus group discussions.**

The study notes that legislation, the policy landscape and the performance of EPR schemes remain heterogeneous and differ vastly amongst European countries and EU Member States, with some EPR schemes consistently performing above average, meeting ambitious targets set out at EU level (e.g. in terms of collection rates) and others continuing to underperform.

Many stakeholders have expressed their concerns about the increasing complexity of the EPR landscape, highlighting that the large discrepancies between countries can create **inefficiencies** and adversely affect the functioning of the EU single market.

Policy Design Overview

The analysis demonstrates that the performance of EPR schemes for Waste Packaging is strongly influenced by socio-economic context and national modalities for implementation. However, Adelphi promote the following guiding principles for designing an EPR scheme:

- The design of an EPR scheme should be **clear**, **transparent**, and **easy to understand** for all stakeholders. The implementation should be effective, with **clear responsibilities** and roles for all actors involved, such as **producers**, **waste management companies**, and **regulators**.
- **Funding and financing:** EPR schemes should have adequate funding and financing to cover the costs of the end-of-life management of the products. The financing should be transparent and fair, with the costs shared among all stakeholders based on their contribution to the waste generated.
- **Collection and recycling rates:** The EPR scheme should aim to increase the collection and recycling rates of the products covered under the scheme. The collection and recycling infrastructure should be adequate and efficient, with clear targets and incentives for all stakeholders.
- **Monitoring and evaluation:** The EPR scheme should be subject to regular monitoring and evaluation to assess its effectiveness and identify areas for improvement. The monitoring and evaluation should be transparent and involve all stakeholders, with clear indicators and benchmarks to measure the scheme's performance.
- **Scope of EPR obligations**: The scope of EPR obligations refers to which products or materials are covered by the policy. Policies that cover a wide range of products and materials are likely to be more effective in reducing waste and promoting recycling than policies that only cover a limited number of products or materials.

Policy Design Overview

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Due to differences in scope, distribution of tasks, definitions, methods, and data quality available for different EPR schemes, Adelphi found that a direct comparison of schemes was not possible. Instead, the study made general observations on the effectiveness of EPR systems. To address shortcomings in current EPR schemes and meet regulatory requirements, the study also proposed recommendations for effective implementation of EPR requirements.

Competitive vs Monopolistic:

- Competition between PROs can create leverage for innovation and increase efficiency. In competitive systems, the implementation of modulated fees proves to be more challenging than in monopolistic setups, as here the products registered with the PROs do not directly correspond to the waste collected. A coordination centre should be set up to support system-level innovation in a competitive environment. Customer satisfaction tends to be higher in competitive systems. Competition can keep costs for waste management operations low. Competition for the access to waste may lead to inefficiencies and higher costs.
- Monopolistic systems have an advantage in making investments that are not linked to an immediate return. Information and awareness campaigns tend to be larger and more far-reaching in monopolistic systems than in competitive systems.

Policy Design Overview

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Collection responsibilities should be coordinated and monitored via a coordinating body.

- Adelphi recommend that there should be a designated group or organization responsible for overseeing waste collection efforts, and that this group should work together with other relevant stakeholders (such as local government officials, waste management companies, and community groups) to ensure that waste is being collected in a coordinated and effective manner. This coordinating body should also be responsible for monitoring waste collection activities to ensure that they are meeting the necessary standards and regulations.

Measurable indicators for the effectiveness of information and awareness-raising campaigns should be defined.

- Adelphi suggest it is important to create measurable goals and benchmarks for any campaigns or initiatives aimed at raising awareness about waste reduction and management. By defining specific indicators and metrics for success (such as increased recycling rates or reduced amounts of waste generated), it is possible to track progress over time and make adjustments to the campaign as needed to ensure that it is having the desired impact.

Policy Design Overview

It is essential to make the implementation as simple as possible for both producers and authorities.

- Adelphi emphasize the importance of keeping waste management processes as simple and straightforward as possible, both for the producers (i.e. the individuals or organizations generating the waste) and the authorities responsible for managing it. By streamlining processes and minimizing unnecessary bureaucracy, it is possible to reduce costs and increase efficiency in waste management.

Adelphi note that it is difficult to find a harmonized definition of the necessary costs for compliance with the Waste Framework Directive. However, prices can be compared with equivalent services to guarantee that the costs of waste management services do not exceed a necessary level.

- The report discusses the challenge of determining the costs associated with complying with the Waste Framework Directive. While there may not be a universal definition of these costs, it is still important to ensure that prices for waste management services are reasonable and do not exceed what is necessary to comply. This can be done by comparing prices with similar services in other areas and making adjustments as needed to ensure that costs remain within reasonable limits.

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EPR’s Role in Increasing Circularity: Deposit Return Schemes

EPR & Deposit Return Schemes

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According to the OECD (2022) the combination of a DRS and other mandatory EPR policy instruments can create synergies that enhance the quality and quantity of recycling, promote reuse systems, and encourage eco-design . Implementing mandatory DRS has been highly successful in diminishing littering as well as reaching high levels of collection and recycling. DRS also is typically associated with collected plastic material with a much higher quality compared to the kerbside collection system. This creates higher resource efficiency for collected plastic waste as it can be recycled in higher volumes and to a higher quality level (e.g. bottle-to-bottle recycling).

The effectiveness of deposit-return systems (DRS) and extended producer responsibility (EPR) policies in promoting **recycling** and **reducing waste** depends on several factors related to the design and implementation of the policy.

EPR & Deposit Return Schemes

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Factors related to the design and implementation of the policy (OECD, 2022):

- **Deposit levels**: The amount of the deposit paid by consumers when purchasing a product can influence the likelihood of the product being returned for recycling. A higher deposit may encourage consumers to return the product, while a lower deposit may not provide enough incentive.
- **Collection systems**: The way in which products are collected for recycling can also impact the effectiveness of DRS and EPR policies. A well-designed and convenient collection system can encourage more consumers to return their products for recycling.

It should also be noted that consumers play an important role in supporting the collection of various products and waste streams. DRS needs to be **clearly explained** and the return of products made as **convenient** as possible for the consumer. Moreover, good relationships need to be established with retailers, as they can act as an important conduit of information to the consumer and bridge the information gap between producers and consumers. They may also be involved in the collection of end-of-life products.

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Opportunities Moving Forward

Consumer/Public Approval

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Consumers are happier to buy into EPR if they perceive high environmental harm – this is applicable where EPR costs end up being passed down to the consumer (Lakhan, 2016) .

There is a statistically significant correlation between the consumer perceived environmental harm associated with the product and their willingness to pay for the environment-related additional fee.

Lakhan also found that consumers who believed that producers should take responsibility for the environmental impact of their products were more likely to support EPR schemes and be willing to pay environmental handling fees. However, consumers who were sceptical of producer responsibility or believed that consumers should bear the responsibility were less likely to support EPR schemes.

Lakhan suggests that consumer attitudes and perceptions play an important role in shaping the success of EPR schemes. To increase consumer support for EPR schemes, it may be important to improve consumer education and understanding of EPR concepts, as well as to address concerns and scepticism about producer responsibility. Additionally, it may be necessary to ensure that environmental handling fees (EHF) are set at reasonable levels and that the benefits of EPR schemes are effectively communicated to consumers.

Innovative Proposals for Improving Sustainability

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Cai and Choi, 2021 undertook a systematic review of literature on sustainability in supply chains, with a focus on identifying research gaps. They proposed a list of innovate tools for enhancing EPR, summarised below:

- Employ life cycle assessments and streamlined life cycle assessment schemes for EPR.
- Using the mass balance approach to evaluate and improve the EPR policy.
- Develop a design and decision assisting life cycle design (LCD) system.
- Establish an innovative “design for dismantling” (DfD) approach.
- Applying grey relational analysis for finding the optimal options for end of life (EoL) products.
- Develop a multicriteria matrix tool to improve EoL products.
- Producers take collaborative actions under EPR to channel a relationship for sustainability.
- Computer aided design or analysis can also be employed to support EPR.
- Use E-Platforms for the operations of online material and waste exchanges, and transaction and product information can enhance the exchange efficiency.

Opportunities for Improvement Deposit Return Schemes and EPR

OECD report "Deposit-refund systems and the interplay with additional mandatory extended producer responsibility policies" examines the interplay between deposit-refund systems (DRS) and other mandatory extended producer responsibility (EPR) policies, and offers several key suggestions based on its analysis. Some of these key suggestions include:

1. Combining DRS and EPR policies to create synergies that improve the quality and quantity of recycling, encourage eco-design, combat littering, and influence consumer behaviour.
2. Ensuring that DRS and EPR policies are designed to address specific environmental goals, and that they are tailored to the needs and characteristics of each product and sector.
3. Establishing clear legal frameworks and standards that outline the responsibilities of producers and other stakeholders, promote accountability and transparency, and incentivize the adoption of circular economy principles.

Opportunities for Improvement Deposit Return Schemes and EPR

OECD report "Deposit-refund systems and the interplay with additional mandatory extended producer responsibility policies" further suggestions include:

4. Encouraging stakeholder engagement and collaboration in the development and implementation of DRS and EPR policies, including the involvement of producers, consumers, and other relevant actors.
5. Promoting innovation and eco-design by setting clear targets and standards for product design and ensuring that the costs and benefits of different design options are accurately reflected in the financial mechanisms of DRS and EPR policies.
6. Implementing effective monitoring, evaluation, and reporting systems to ensure that DRS and EPR policies are achieving their intended environmental outcomes, and that they are continuously improved and updated over time

EPR & Design for Environment

Product design innovation, such as design for environment (DfE) and design for disassembly (DfD), are important aims of EPR. These design approaches aim to reduce the environmental impact of products throughout their lifecycle, including their end-of-life (EoL) stage. New design metrics can be developed to help designers assess and improve the environmental performance of their products, which can ultimately lead to better compliance with EPR regulations.

Current experience of EPR across the EU has shown that the applied measures have not succeeded in motivating packaging producers to turn to eco and circular design (Filho *et al.*, 2019). The main reasons for this are the relatively low compliance costs for producers with EPR and the lack of differentiation of producer fees based on circular design (e.g. reusability or recyclability).

To ensure improved circular design of plastic products under the EPR, common incentives are important for producers that favour circular products and incorporate EPR as part of their business models, instead of treating it separately.

One such incentive is to bring in **minimum requirements on product design** regarding the origin of materials (e.g. small or composite packaging) and repairability of the product, as well as limits for additives/chemical substances that are problematic for product waste management.

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Opportunities for Improvement

Opportunities for Improvement

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- The strengths and weaknesses of EPR schemes are context-dependent and vary depending on the design and implementation of the scheme, as well as the waste stream and the regulatory context in which they are implemented.
- A more ambitious and harmonised EPR implementation plan in EU Member States could contribute towards a circular economy in the plastics sector. This should consider complementary economic instruments to steer demand and use in the right direction (e.g. product or waste taxes).
- This should include also harmonisation of other relevant economic instruments to ensure fair competition between EPR schemes on a national as well as EU level and better transparency on performance and costs.

Opportunities for Improvement – Transparency and Accountability

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- **Increasing the transparency of EPR schemes**. EPR schemes can be complex and difficult to understand, which can lead to a lack of transparency in the collection and distribution of fees and the allocation of responsibility. EPR schemes need to be more open and clear about how they operate, the costs associated with their operation, and the contributions made by different stakeholders. This can help increase trust and accountability.
- **Improving the accountability of producers.** Producers have a responsibility to design products that are easy to recycle and dispose of at the end of their lifecycle. Research suggests that some producers are not taking their responsibility seriously, and this can lead to suboptimal EPR scheme performance. To address this, EPR schemes need to be more proactive in enforcing compliance with regulations and encouraging producers to adopt environmentally-friendly product designs.

Opportunities for Improvement – Local Authority Involvement

Extended producer responsibility (EPR) is a policy approach that seeks to make producers of goods responsible for the environmental impacts of their products throughout the entire product lifecycle, including the end-of-life phase. For EPR to be effective, it is important to have clearly defined systems that motivate local authority involvement. One system that has been proven effective in encouraging local government involvement in EPR is where the physical liability of EPR lies with local government, while the financial burden is placed on producers. This system encourages communication, coordination, and support between local governments and producers. The OECD (2021) note that this approach has had a positive effect in some countries.

Research has shown that EPR initiatives have been more successful when local authorities are engaged in the design and implementation of national systems and existing waste infrastructure is utilized. A study by Cahill et al. (2011) found that collaboration and communication between local authorities and other stakeholders, including producers, is key to the success of EPR initiatives. Overall, involving local authorities in EPR can lead to more effective and efficient systems. This requires communication and collaboration between stakeholders, including producers and local government. By working together and utilizing existing infrastructure, EPR initiatives can be successfully implemented, resulting in positive environmental outcomes.

Moving Forward: EPR and Reuse/Refill

EU Proposal for a directive on packaging and packaging waste is concerned primarily with regulatory requirements. For example:

- Complete ban on all non-recyclable packaging by 2030
- Ban on single use packaging for fresh produce under 1.5kg
- All packaging must have digital product passport detailing materials and construction
- Mandatory targets for use of reusable packaging – 20% to 90% by product type.

The likely role of EPR includes:

- Modulation on reusability or actual reuse rate achieved
- Introduction of DRS schemes for takeback for reuse / refill

Conclusions

EPR can be an effective and useful tool in reducing plastic waste and assisting in the move to a more circular economy. Our review of the literature has provided the following conclusions.

- EPR should be seen as part of a broader strategy for achieving a circular economy, rather than as a standalone solution (Campbell-Johnston *et al.*, 2021). EPR should focus on reducing the environmental impact of products throughout their lifecycle (through encouraging product eco-design and improving collection and recycling systems). To influence product design, EPR requires a significant cost differential between desired and undesirable packaging options.
- Implementation should be shared among producers, consumers, and the government. For EPR initiatives to succeed, it will be crucial to foster collaboration and coordination among stakeholders.
- Harmonisation between European countries on EPR regulations has the potential to improve efficiency and deliver improved environmental outcomes while reducing unnecessary compliance costs.

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Thank You.

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