

Extended Producer Responsibility for E-Waste Management in Cameroon: Policy and Regulatory Perspectives

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Abstract

The increasing generation of electronic waste (e-waste) presents growing environmental and public health challenges, particularly in countries with limited formal waste-management capacity. In Cameroon, e-waste is increasingly managed through informal activities, while existing systems remain inadequate to address its growing volume and complexity. This article examines Extended Producer Responsibility (EPR) as a policy option for improving e-waste management in Cameroon. Using an analytical approach, it examines the concept, objectives and mechanisms of EPR and assesses its application in selected jurisdictions, including Ireland, Germany, South Africa and Nigeria. The analysis shows that EPR reallocates responsibility for the management of products at the post-consumer stage, placing primary financial and/or operational responsibility on producers, while defining complementary roles for importers, consumers, government authorities and waste management actors. However, the comparative experience also demonstrates that EPR cannot simply be transferred from one jurisdiction to another without considering institutional capacity, market structure, enforcement mechanisms and informal waste-management practices. The article therefore proposes a context-specific and phased approach to EPR in Cameroon, supported by an appropriate legal and institutional framework. Properly designed and enforced, EPR could complement existing waste-management measures and provide a more sustainable framework for e-waste management in Cameroon. The Cameroonian legislator should therefore establish a clear and sufficiently broad legal framework for EPR to ensure its effective application to e-waste management.

Keywords: E-waste; Extended Producer Responsibility; Waste Management; Recycling; Cameroon; Environmental Policy.

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INTRODUCTION

Traditional environmental policies that focus primarily on production processes may no longer be sufficient to achieve the changes needed to protect human health and the environment. [1] Indeed, municipalities are increasingly overwhelmed by rising volumes of e-waste, while traditional measures have not been sufficient to address this growing problem. Against this background, many countries have introduced formal recycling programs for the management of e-waste. The majority of these programs are based on the concept of extended producer responsibility. The adoption of the extended producer responsibility principle (EPR) as a

strategy for improving e-waste management has gained momentum in many countries. If Cameroon is to move towards sustainable management of e-waste, it must therefore develop alternative strategies for e-waste management. [2] This article presents the Extended Producer Responsibility approach to e-waste management as a mechanism that, if incorporated into the legal framework, could improve e-waste management in Cameroon. Even though EPR has been implemented in several jurisdictions, its applicability cannot be assumed in Cameroon because of differences in institutional capacity, market structure, infrastructure and the role of informal recyclers. The central issue,

¹ OECD (2016), *Extended Producer Responsibility: Updated Guidance for Efficient Waste Management*, OECD Publishing, Paris, p.18.

² Bogdan-Martin D. (2022), "How Africa is Leading the Way with 'e-waste'", *Climate Champions*.

<https://climatechampions.unfccc.int/how-africa-is-leading-the-way-in-dealing-with-e-waste>. Accessed on June 3, 2026.

however, is not merely how e-waste should be managed but how legal responsibility for its management should be allocated among the actors who place, use, and handle electrical and electronic equipment.

THE CONCEPT OF EXTENDED PRODUCER RESPONSIBILITY (EPR)

While there are many definitions of EPR, the OECD defines EPR as “a policy approach that makes producers responsible for their products along the entire lifecycle, including at the post-consumer stage”. [3] EPR is a financial and/or operational instrument with a dual aim: internalizing environmental externalities associated with end-of-life management and fostering the implementation of sustainable product and waste management schemes in line with the waste hierarchy principle and with qualitative recycling and recovery targets. [4]

OBJECTIVES OF EPR SCHEMES

Many policies and programs have been introduced to address increasing volumes of waste, but these have not been sufficient to address the problem effectively. [5] EPR provides an alternative approach by extending responsibility for products beyond their use to the post-consumer stage. Its principal objectives include waste minimization and improvement in product design. [6]

Waste Minimization

The main goal of EPR is to reduce pollution resulting from the use and disposal of products. It incorporates the pollution prevention principle by recognizing that the environmental risks associated with production, use and disposal of products can be reduced through product design, including by replacing or eliminating toxic substances and ensuring appropriate treatment of waste. [7] The establishment of facilities for collection, separation, and recovery of discarded products is also essential to improving waste management. Such facilities enable manufacturers to recover components and materials for reuse and recycling, thereby reducing pressure on natural resources. [8] Although waste prevention is generally

preferable to other waste management options, including recycling, appropriate waste treatment can also encourage innovation in recycling and recovery technologies. [9]

Improved Product Design

EPR also seeks to influence product design by shifting attention to the environmental impacts of products throughout their life cycle, including after the end of their useful life. The reallocation of waste management responsibility creates incentives for producers to develop more environmentally friendly products that use fewer resources and are easier to dismantle, recycle, reuse, recover and appropriately dispose of. [10]

These two objectives discussed above, together with the comprehensive character of EPR schemes, have been emphasized in literature and have informed EPR policy development in advanced countries. However, many attempts to implement EPR in developing countries have followed models developed in advanced economies without fully accounting for differences in institutional and implementation capacity. This creates a gap between the objectives of comprehensive EPR schemes and the capacity of developing economies to implement them effectively. [11]

SCALE OF RESPONSIBILITY (INDIVIDUAL VS COLLECTIVE RESPONSIBILITY)

EPR may be implemented through either individual or collective responsibility. Under an individual scheme, producers directly manage the end-of-life products they place on the market. This may involve establishing their own collection, recovery, refurbishment or recycling arrangements, thereby maintaining direct control over the management of their products throughout the post-consumer stage. [12]

In practice, most producers within a specific sector choose to carry their EPR obligations jointly, through third-party entities called *producer responsibility organizations* (PROs). [13] These PROs are financed by producers to assume responsibility for

³ OECD (2024), “Extended Producer Responsibility: Basic facts and key principles”, OECD Publications, Paris, p.6.

⁴ OECD (2016), *Op. Cit.*, p.18.

⁵ *Ibid.*

⁶ Akenji L. (2012), “Applying EPR in Developing Countries”, IGES Rio+20 Issue Brief, Vol.3, p.2.

⁷ Chris V. R. *et al.*, (2006), “Extended Producer Responsibility: An Examination of its Impact on Innovation and Greening Products”, Greenpeace International, p. 4.

⁸ OECD (2016), *Op. Cit.*, p.22.

⁹ Salzman J. (1997), “Sustainable Consumption and the Law”, *Journal of Environmental Law*, Vol.27, Pp.1243-1294, p.1274.

¹⁰ *Ibid.*

¹¹ Akenji L. (2012), “Applying EPR in Developing Countries”, IGES Rio+20 Issue Brief, Vol.3, p.2.

¹² Lindhqvist T. (2000), *Extended Producer Responsibility in Cleaner Production: Policy Principle to Promote Environmental Improvements of Product Systems*, Department of Industrial Environmental Economics, Lund University, p.70.

¹³ Dimitropoulos A. *et al.*, (2021), “Extended Producer Responsibility: Design, Functioning and Effects”, Netherlands Environmental Agency, PBL Publications, no.4511, P.14.

post-consumer products on their behalf. Collective schemes do not, however, entail that the financial responsibility for the post-consumer stage of products is transferred to PROs. It only allows producers to pool their resources and manage waste through a common system, while the underlying responsibility for meeting EPR obligations remains with the producer. [14]

The choice between individual and collective responsibility depends largely on the structure of the EPR system and the circumstances of the jurisdiction in which it operates. For e-waste management, collective schemes may be particularly useful where individual producers lack the infrastructure or capacity to establish separate collection and recycling systems.

THE ROLE OF EPR IN E-WASTE MANAGEMENT

EPR extends responsibility for electrical and electronic equipment to its end-of-life stage. By shifting responsibility for the management of discarded products to producers, while defining complimentary responsibilities for consumers and other actors, EPR can improve waste management and encourage more responsible disposal practices. This approach is particularly relevant to developing countries, where resources for managing growing volumes of e-waste are often limited. [15]

The effectiveness of EPR depends largely on clearly defining who constitutes a producer. Although there is no universally adopted definition in international law, the concept generally encompasses manufacturers, importers, brand owners and, in some circumstances, sellers. The OECD recognises the importance of defining the producer within the EPR framework, while the EU has provided a more specific definition in the context of WEEE. Article 3(1)(f) of Directive 2012/19/EU defines a producer to include manufacturers, resellers, persons placing EEE from another country on the national market, and certain distance sellers.

The definition of the producer is therefore not merely a conceptual issue but also a matter of regulatory design. A national EPR framework must clearly identify the persons or entities upon whom financial, physical and reporting obligations may be imposed. A clear statutory definition is particularly important in an import-dependent market, where the manufacturer may be located outside the jurisdiction and may therefore be difficult to subject directly to domestic enforcement. [16]

STAKEHOLDER ROLES AND RESPONSIBILITIES IN EXISTING EPR SCHEMES FOR E-WASTE MANAGEMENT

The main objective of EPR is to shift responsibility for management of a product at its end-of-life from municipalities towards producers. In most schemes, however, municipalities remain responsible for some aspects of the organization of waste management. Other actors, such as consumers and waste management operators, are usually also involved. In Japan's packaging EPR system, for example, the Packaging Recycling Act allocates different responsibilities among consumers, municipalities and producers. In Germany, municipal authorities continue to play a role in the collection of households WEEE, while producers have defined responsibilities for financing, collection and treatment under the ElektroG framework.

Producer Responsibilities Under EPR

Under the WEEE Directive, the concept of producer encompasses manufacturers, own-brand resellers, persons placing EEE from another Member State or third country on the national market, and certain distance sellers. EPR schemes may impose both financial and physical responsibilities on producers for the management of post-consumer products, although the precise allocation of responsibilities varies according to the scheme and jurisdiction.

Financial Responsibility for E-waste Management

Under the WEEE Directive, producers bear financial responsibility for managing products at the end of their useful life. A producer may fulfil this responsibility individually or through a Producer Responsibility Organisation (PRO), with members contributing their proportionate share of the costs of managing their e-waste. Producers may also be required to guarantee the performance of the PRO and meet additional obligations where established EPR targets are not achieved.

Physical Responsibility for Post-Consumer Products

Producers are required to meet established objectives for the reuse, recycling and recovery of covered products. EPR schemes may also impose physical take-back obligations, including providing appropriate collection facilities and enabling consumers to return end-of-life products free of charge at or near the point of sale.

¹⁴ Examples are the *Duales System Deutschland* in Germany and *Eco-Emballages* in France.

¹⁵ Rammaniya T. (2010), *Extended Producer Responsibility (EPR): an Alternative Solution to Regulate the International Electronic Waste Trade*, PhD

Thesis, Golden University School of Law, California, p.205.

¹⁶ Irekpitan O. (2015), *Towards the Sustainable Management of Electronic Waste in Nigeria: South Africa as a Model*, PhD Thesis, Department of Public Law, University of Cape Town, South Africa, p.60.

Roles and Responsibilities of Producer Responsibility Organisations (PROs)

A Producer Responsibility Organisation (PRO) is an entity established under collective EPR schemes to implement certain EPR obligations on behalf of participating producers, particularly by financing the collection and treatment of targeted waste. PROs may operate as non-profit, quasi-governmental or for-profit entities and may assume collective financial and physical responsibility for post-consumer electrical and electronic equipment. [17]

Collective Financial Responsibility

A PRO assumes financial responsibility for post-consumer e-waste on behalf of participating producers. It generally collects fees from producers according to an agreed fee structure and uses these funds to finance waste collection, sorting and treatment. Fees may be fixed or variable, with each producer contributing a proportionate share of the costs associated with managing its products. [18 19]

Collective Physical Responsibility

Where producers do not individually meet established take-back and recycling obligations, the PRO assists producers in fulfilling these requirements. It works with producers and consumers to support proper separation, collection, processing and subsequent management of e-waste in accordance with EPR requirements. The PRO is also responsible for ensuring the traceability of e-waste collected and transferred to waste operators. [20]

Consumer Responsibilities under EPR

Consumers play an important role in the effectiveness of EPR schemes by participating in the proper disposal and return of end-of-life products.

Financial Responsibility

Although EPR primarily places financial responsibility on producers, some schemes may require consumers to contribute to the cost of post-consumer management through an advance disposal fee, deposit, eco-tax or similar charge. Such costs may also be incorporated into the product price rather than charged separately.

Physical Responsibility

At the end of a product's useful life, consumers are expected to separate e-waste from other waste streams, make it available for separate collection, or return it to designated collection points or participating retailers. Consumer participation is therefore essential to effective collection and recycling, and proper consumer education can encourage compliance. [21]

The Role of National Governments

National governments are responsible for establishing the legal framework for EPR, as well as monitoring and enforcement mechanisms. They also support EPR by eliminating conflicting policies and adopting supportive measures. The introduction of EPR changes the responsibilities of local authorities and producers, making it necessary to define the respective roles of municipalities and PROs. Municipalities may continue to collect and treat end-of-life products or oversee PRO activities, depending on the EPR scheme. [22] They may also stimulate recycling markets, support the development of recycling capacity, and facilitate information sharing among stakeholders. [23].

ASSESSMENT OF EPR IN SELECTED JURISDICTIONS

EPR operates differently across jurisdictions. This section examines its application in two developed countries, Ireland and Germany, and two developing countries, South Africa and Nigeria, to identify approaches relevant to e-waste management in Cameroon.

Ireland

Ireland implemented the EU WEEE framework through the Waste Management (Waste Electrical and Electronic Equipment) Regulations 2005, establishing producer registration and responsibility requirements. Ireland subsequently updated its national framework to reflect the recast WEEE Directive 2012/19/EU. [24]

Germany

Germany's EPR system requires producers to register with the Stiftung Elektro-Altgeräte Register (EAR) before placing electrical and electronic equipment on the market. Producers are also required to provide an insolvency-safe financial guarantee for the financing of take-back and disposal of relevant household WEEE.

¹⁷ Pouikli K. (2020), "Concretizing the role of Extended Producer Responsibility in European Union Waste Law and Policy through the Lens of the Circular Economy", *Academy of European Law*, ERA Forum, Springer, Vol. 20, pp.491-508, p.499.

¹⁸ Magalini F. et al., (2021), "Extended Producer Responsibility Schemes and their Strategic Role for Producers", *Sofies*, p.8.

¹⁹ Nakao T. (2003), "EPR Programmes: Individual versus Collective Responsibility", International Institute for Industrial Environmental Economics Reports, p.68.

²⁰ *Ibid.*

²¹ Fishbein B. K. (1994), *Germany, Garbage, and the Green Dot: Challenging the Throwaway Society*, INFORM Inc. New York, p.24.

²² OECD (2016), *Op. Cit.*, p.40.

²³ *Ibid.*

²⁴ WEEE Forum. (2020), "An Enhanced Definition of EPR and the Role of Actors", p.12. Available at web link https://weee-forum.org/wp-content/uploads/2020/11/EPR-and-the-role-of-all-actors_final.pdf. Accessed on June 27, 2026.

The German system also links producer collection responsibilities to the quantities of equipment placed on the market. [25]

South Africa

South Africa has developed EPR within a broader waste-management framework established under the National Environmental Management: Waste Act 59 of 2008. The Extended Producer Responsibility Regulations, 2020, made under the Waste Act, established a framework for the development, implementation, monitoring and evaluation of EPR schemes and applied to identified waste streams, including electrical and electronic equipment and lighting. The South African system therefore provides a statutory and mandatory framework for EPR in the EEE sector. [26]

Nigeria

Nigeria incorporated EPR into the National Environmental (Electrical/Electronic Sector) Regulations, 2011 (S.I. No. 23 of 2011), which applied to new and used electrical and electronic equipment and required importers, exporters, manufacturers, assemblers, distributors and retailers to participate in an EPR programme, including take-back arrangements. [27] More recently, Nigeria has updated its regulatory framework through the National Environmental (Electrical/Electronic Sector) Regulations, 2022 (S.I. No. 79 of 2022), which NESREA currently identifies as the applicable sectoral regulation. Nigeria's EPR framework therefore provides a useful example of an approach that expressly includes importers and other supply-chain actors within responsibility for e-waste management. [28] Earlier efforts by the Nigerian government, together with a coalition of private sector actors, included the launch of an EPR program in 2016, which sought to place greater responsibility on importers, exporters, manufacturers, assemblers,

distributors, and retailers whose products ultimately become e-waste. [29]

The jurisdictions examined demonstrate the use of statutory and/or mandatory EPR mechanisms for e-waste, although their scope, institutional arrangements and allocation of responsibilities differ. The inclusion of importers and other supply-chain actors in Nigeria is particularly relevant to Cameroon, where tracing original manufacturers may present similar challenges.

POTENTIAL BENEFITS OF EPR SCHEMES FOR E-WASTE MANAGEMENT

Existing EPR schemes have recorded several environmental, economic and social benefits.

Design for Environment

By shifting responsibility for end-of-life impacts to producers, EPR creates incentives for environmentally conscious product design. [30] It can reduce waste-management costs and material use while improving product reusability and recyclability. [31] Evidence of such changes is also found among Japanese EEE manufacturers, which introduced material substitutions to improve recyclability. [32]

Increased Recycling

EPR supports separate collection and recovery systems, creating opportunities for the reuse and recycling of products and components and reducing pressure on virgin resources. [33] Evidence also indicates increased recycling and reduced waste disposal in countries operating EPR schemes, although attributing these changes solely to EPR remains challenging. [34]

Economic Incentives

By shifting financial responsibility for collection, treatment and recycling from government to producers, EPR can reduce the burden on public budgets while encouraging producers to design products that are easier and less costly to recycle. [35]

²⁵ Section 2 of the Act on the placing on the market, the return and the environmentally friendly disposal of electrical and electronic equipment (Elektro-und Elektronikgerätegesetz-ElektroG).

²⁶ Zali M. (2021), "New Electronic Waste Management Regulations in South Africa". <https://mg.co.za/environment/2021-10-18-new-electronic-waste-management-regulations-will-take-effect-in-november/>. Accessed on June 27, 2026.

²⁷ Amachree M. (2012), E-Waste management in Nigeria, National Environmental Standards and Regulations Enforcement Agency (NESREA), Taipei. See also Section 16 of the National Environmental (Sanitation and Wastes Control) Regulations 2009 of the Federal Republic of Nigeria.

²⁸ Irekpitan O. (2015), *Op. Cit.*, p. 297.

²⁹ Amachree M. (2013) Update on E-waste Management Nigeria, National Standards and Regulations

Enforcement Agency (NESREA), Presentation at the 3rd Annual Meeting of the Global E-waste Management Network (GEM₃), San Francisco, USA, 15th – 19th, 2013.

³⁰ Naoko T. *et al.*, (2006), "Extended Producer Responsibility: An Examination of its Impact on Innovation and Greening Products", Report Commissioned by Greenpeace International, Friends of the Earth and the European Environmental Bureau, p. 5. ³¹ <https://www.oecd.org/env/tools-evaluation/extended-producer-responsibility.htm>. Accessed on June 7, 2026.

³² Yamaguchi M. (2002), "Extended Producer Responsibility in Japan" Keio University, Tokyo, Japan, p. 3.

³³ Naoko T. *et al.*, (2006), *Op. Cit.*, p. 5.

³⁴ OECD. (2016), *Op. Cit.*, p. 22.

³⁵ Catherine K. *et al.*, (2002), "Globalization, Extended Producer Responsibility and the Problem of Discarded

EPR schemes can also generate economic opportunities and employment in collection and recycling. [36] They may further reduce public expenditure and encourage more cost-efficient collection and recycling practices.

Social Incentives

EPR can facilitate the integration of informal recyclers into formal e-waste management systems. [37] Partnerships with informal workers can improve collection while providing safer working conditions, skills development and greater participation in recognized take-back schemes. [38]

WEAKNESSES OF EXISTING EPR SCHEMES FOR E-WASTE MANAGEMENT

Despite its potential benefits, EPR presents several implementation challenges, particularly in developing countries, as follows.

Complexity in Implementation

The implementation of EPR is more challenging in developing and least-developed countries because of difficulties in identifying and tracing producers. Unbranded and counterfeit products, widespread repairs involving replacement components, smuggling and producer bankruptcy can further complicate the allocation of responsibility. [39] These challenges highlight the need to adapt EPR models to national circumstances rather than replicate systems developed in industrialised countries.

Free-Riding

Free riders may benefit from EPR systems without contributing their appropriate share of the costs. This is particularly relevant to sellers operating through online marketplaces and fulfilment arrangements, who may avoid EPR obligations and the associated costs of e-waste treatment. [50] Such practices can undermine the

effectiveness of EPR and disadvantage compliant producers.

Orphaned and Existing Products

Orphan products, which are products subject to EPR requirements whose producers can no longer be traced or have ceased operations, present another challenge in the implementation of EPR. [40] Existing products placed on the market before EPR was introduced also raise questions about who should bear responsibility for their end-of-life management.[52] Several financing mechanisms may however be used to address these products, including advance disposal fees, [41] purchase fees, [42] last-owner-pays systems, [43] insurance and phased implementation. [44] Under the EU WEEE framework, financing responsibility for certain historical WEEE is allocated among producers according to their respective market shares.

LESSONS FOR CAMEROON FROM COMPARATIVE EXPERIENCE

The experiences of other jurisdictions examined above reveal that, even though the underlying objective of EPR is to place greater responsibility for the environmental costs of a product on the entity that introduces the product on the market, EPR does not operate according to a single model. Institutional arrangements through which this responsibility is implemented vary according to national circumstances. The experiences of Germany and Ireland illustrate the importance of strong regulatory systems, producer registration, collection infrastructure and clearly defined financial responsibilities. South Africa and Nigeria, on the other hand, demonstrate the need to adapt EPR to developing-country contexts, where institutional capacity, informal recycling, market structures and enforcement mechanisms may present additional challenges. These experiences offer several lessons that

Computers in China: An Exploratory Proposal for Environmental Protection”, *14 Geo. Int’l Env’t. L. Rev.*, pp. 525-553, p.525.

³⁶ Chalmin P. and Gaillochet (2009), “From Waste to Resource: an abstract of World Waste Survey 2009”. <https://www.veolia-environmentalservice.com/veolia/resources/files/1/927>. Accessed on July 5, 2026.

³⁷ Lungrend K. (2012), *The Global Impact of E-waste: Addressing the Challenge*, International Labor Office Publications, Geneva, Switzerland, p.49.

³⁸ Hinchliffe D. *et al.*, (2020), “Partnerships between the Informal and the Formal Sector for Sustainable E-waste Management”, StEP Initiative, p.8. Available at web link www.step-initiative.org. Accessed .

³⁹ Akenji L. (2012), “Applying EPR in Developing Countries”, IGES Rio+20 Issue Brief, Vol.3, p.2.p.2.

⁴⁰ Harvey N. (2019), “Free Riders and the Impact on EPR Model”, *Recolight*. Available at

<https://www.recolight.co.uk/free-riders-and-impact-on-epr-model-to-stewardship-forum-in-paris/>. Accessed on July 20, 2026.

⁴¹ Under this method, a fee levied on a new purchase at the point of sale goes towards funding end-of-life management of a similar product already at the post-consumer stage. One drawback of this policy is that it may be difficult to establish a direct lien between the fee levied on the new product and the cost of dealing with that particular product when it is discarded.

⁴² A fee paid at the time of purchase uses the tax base of new sales of a product to fund end-of-life management of products sold earlier.

⁴³ In this case the incidence of responsibility for end-of-life management falls on the consumer.

⁴⁴ Where there are serious concerns about fairness of levying fees on new products to pay for end-of-life management of existing products, and advanced fees are not considered viable, phasing in EPR and associated costs gradually to consumers is the best option.

are relevant to the development of an EPR framework for e-waste management in Cameroon.

First, responsibility must be assigned to clearly identifiable market actors. An effective EPR scheme demands that producers should be registered and their obligations clearly defined to eliminate ambiguity. This is particularly relevant in the context of Cameroon, where imports are the main channel for the introduction of electrical and electronic equipment into the market. An important lesson can be drawn from the Nigerian experience. The responsibility framework should include importers and other actors introducing products on national markets, instead of limiting responsibility to domestic manufacturers.

Second, collective mechanisms can facilitate EPR implementation. Through Producer Responsibility Organizations (PROs), producers and importers can pool resources and support collection, transportation, treatment and recycling. Such an approach may be more practical for Cameroon than requiring every producer to establish an independent take-back system. PROs should, however, operate within a clear regulatory and monitoring framework established by the government.

The third lesson is that EPR models operating in developed countries cannot simply be replicated in developing countries. The European models examined in this study were developed within relatively mature regulatory environments with established waste collection systems, stronger monitoring institutions and the active participation of the formal sector. The challenges facing Cameroon include the dominance of informal recycling, weak enforcement of regulation, and difficulty in tracing products and their producers. Replicating these models in Cameroon without modification may produce limited results. The South African and Nigerian experiences demonstrate the importance of contextual adaptation. An EPR scheme for Cameroon should maintain the underlying principle while designing institutional mechanisms around Cameroon's waste management realities.

Furthermore, EPR design should consider the informal sector. This is an important lesson for Cameroon, as informal actors play a significant role in the waste management sector. An EPR scheme that

ignores informal actors risks creating a parallel informal system that may make it difficult to access the quantities of e-waste currently managed through informal channels. Instead of viewing informal recyclers solely as a problem to be eliminated, Cameroon could explore mechanisms for progressively integrating suitable informal operators into the formal EPR system.

Furthermore, progressive implementation may be more appropriate than immediate full-scale regulation. The comparative experience also suggests that the introduction of EPR can be progressive. For Cameroon, a phased approach may be more realistic than immediately imposing comprehensive obligations across the entire electrical and electronic equipment market. In the light of Cameroon's circumstances, including resource requirements, enforcement capacity, market structures for products and recyclables, political acceptability, [45] and administrative capacity [46], a phased approach is recommended. This approach could begin with a voluntary pilot EPR initiative and then, as institutional capacities develop, transition towards a mandatory system. [47]

Finally, the comparative analysis above demonstrates that although EPR seeks to place financial and operational responsibility for products at the end of their life on producers and not on the government or on taxpayers, it does not eliminate the role of the government. The effective implementation of EPR still requires the intervention of regulatory authorities. The government must establish a clear legal framework, define responsible actors, register and monitor producers and importers, establish standards for waste operators, address free-riding and enforce compliance.

The adoption of an EPR policy for e-waste management in Cameroon does not therefore signify relegating the government in matters of e-waste management. Rather, it should represent a redistribution of responsibilities in which producers and importers assume greater responsibility for the environmental costs of products they place on the market, while the government provides the regulatory framework and oversight to make that responsibility effective.

The lessons learned from other jurisdictions suggest that Cameroon does not need to replicate a single

⁴⁵ Political feasibility refers to the likelihood that a policy would be adopted – that is, the extent to which the policy will be accepted and supported. See Kraft M. and Furlong S. (2010) *Public Policy: Politics, Analysis, and Alternatives*, 6th Edition, SAGE Publications, Inc, p.63.

⁴⁶ Administrability is based on factors like the level of technological development, availability of institutions, etc. In sum, it entails an assessment of available resources and institutional patterns that are difficult to ascertain in order to know whether an instrument will be

easily administered or not. See Kraft M. and Furlong S. (2010), *Op. Cit.*, p.63.

⁴⁷ An initial phase could focus on establishing a national registry of producers and importers, mapping e-waste flows, developing collection infrastructure and testing voluntary take-back initiatives. This could be followed by a transitional phase involving mandatory registration, collective producer responsibility mechanisms, reporting obligations and progressively defined collection and recovery targets.

foreign EPR model. A more appropriate approach should combine elements from established systems with adaptations reflecting the country's import-dependent market, limited formal recycling infrastructure, a dominant informal recycling sector and limited institutional capacity.

THE APPROPRIATE EPR POLICY FOR CAMEROON

The adoption of EPR in Cameroon should take into account the country's institutional capacity, market structure, limited formal recycling infrastructure and the significant role of the informal sector in e-waste management. Instead of adopting an entirely foreign model, Cameroon should develop a flexible system that gradually increases producer and importer responsibility while building the infrastructure necessary for effective implementation.

An appropriate EPR framework for Cameroon should focus on four key areas: public awareness, collection and recycling infrastructure, supporting legislation, and improved knowledge of e-waste flows. [48] Public awareness is necessary to encourage consumers to separate and return unwanted electrical and electronic equipment. At the same time, accessible collection points and environmentally sound recycling facilities are needed to ensure that returned products are properly managed.

The legal system should clearly identify the actors responsible for e-waste placed on the Cameroonian market. Given the importance of imported electrical and electronic equipment, responsibility should extend beyond domestic manufacturers to include importers and other relevant actors placing such products on the market. The framework should also establish clear obligations concerning registration, financing, collection, reporting and recovery.

The informal sector should also be considered in the design of the system. Since informal collectors and recyclers already play an important role in e-waste recovery, their progressive integration into the EPR system could improve collection and traceability while helping to reduce unsafe recycling practices. Appropriate registration and training with authorized recyclers or PROs could provide a practical pathway towards such integration.

Given these considerations, implementation could be phased. An initial phase could focus on establishing a registry of producers and importers, mapping e-waste flows, raising public awareness and piloting collection and take-back schemes. A second phase could introduce collective producer responsibility mechanisms, financing arrangements and reporting

requirements. As institutional capacity develops, Cameroon could move towards a mandatory system with enforceable collection and recovery targets, monitoring mechanisms and sanctions for non-compliance. This gradual approach would allow Cameroon to develop the institutional and technical capacity necessary for EPR while avoiding difficulties associated with immediately imposing a comprehensive system. The objective should ultimately be to establish a system in which producers and importers contribute meaningfully to the management of the products they place on the market, while the government provides the regulatory oversight necessary to ensure effective implementation and compliance.

POTENTIAL BARRIERS TO THE IMPLEMENTATION OF EPR FOR E-WASTE MANAGEMENT IN CAMEROON

Despite its stated benefits, the implementation of EPR in Cameroon may face a number of challenges. Limited awareness amongst producers, consumers and other stakeholders may limit participation and compliance. Institutional and organizational weaknesses may also hinder the registration of producers and importers, monitoring of obligations and enforcement of EPR requirements. In addition, the prevalence of informal recycling infrastructure and the absence of reliable information on e-waste flows may complicate the establishment of effective collection and recovery systems.

Financing represents another potential challenge to the implementation of EPR in Cameroon. This is particularly relevant where producers and importers may be reluctant to assume the additional costs associated with collection and recycling. Weak enforcement and corruption could further undermine compliance and create opportunities for free-riding by actors who benefit from the system without contributing to its financing. Political and industry acceptance may therefore be important for the successful introduction of EPR.

These challenges do not, however, necessarily make EPR unsuitable for Cameroon. Rather, they support the need for a phased approach, beginning with stakeholder awareness, institutional preparation, producer and importer registration, mapping of e-waste flows and pilot collection schemes before progressively introducing mandatory obligations, targets and enforcement mechanisms.

CONCLUSION

The growing volume of e-waste presents significant environmental and public health challenges in Cameroon, while existing waste-management approaches remain insufficient to address the problem

⁴⁸ Nguyen D. Q. *et al.*, (2017), "Material Flows from Electronic Waste: Understanding the Shortages for Extended Producer

Responsibility Implementation in Vietnam", *Procedia CIRP*, Elsevier, Pp.651- 656, p. 655.

effectively. This article has examined Extended Producer Responsibility (EPR) as a policy option for improving e-waste management by extending responsibility for the management of end-of-life products to producers, importers and other relevant actors.

The experiences of Ireland, Germany, South Africa and Nigeria demonstrate that EPR can improve collection, recycling and resource recovery, but also reveal challenges relating to enforcement, financing, free-riding and the identification of responsible producers. These lessons are particularly relevant to Cameroon, given its import-dependent market, limited formal recycling infrastructure and significant informal waste sector.

Cameroon should therefore develop a context-specific EPR framework supported by clearly defined legal responsibilities, appropriate financing mechanisms, effective monitoring and enforcement. A phased approach, beginning with preparatory and pilot measures and progressively moving towards mandatory obligations, would allow the system to develop in line with institutional capacity. Properly designed and enforced, EPR can complement the existing regulatory framework and provide a stronger basis for sustainable e-waste management in Cameroon.

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