

Implementation Of The Refundable Deposit System In Indonesia

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ABSTRACT

Deposit-refund system can influence the behavior of companies and consumers. Many governments have enacted laws to promote recycling as part of a larger effort to reduce waste management and preserve the environment. The purpose of this study was to determine the implementation of the deposit refundable system in Indonesia. The research method used was descriptive qualitative. The results of the study indicate that in Indonesia, laws and regulations governing waste management, from the national to the regional level, already exist in Indonesia. The main legal basis for waste management in Indonesia is Law of the Republic of Indonesia Number 18 of 2008 concerning Waste Management (UU 18/2008, or the Waste Management Law). In principle, Indonesia applies an economic instrument in the application of the deposit refundable system, which is a manifestation of the polluter pays principle, which is an economic policy to internalize the costs of pollution or environmental damage.

Keywords : Deposit, refundable, system, waste, Indonesia

INTRODUCTION

The waste problem is a global concern. With the spread of modernization, the composition of waste continues to change. From a circular economy perspective, recycling is no longer just a legal obligation but also in the personal interest of humanity. (Beamer et al. 2021) Therefore, various efforts have been made by the government to improve recycling practices, by introducing a selective waste collection system, where waste is sorted by residents according to its type.

In some countries, despite previous efforts, appropriate recycling rates have not been achieved, for example in Hungary, where most beverage packaging waste is still placed in mixed containers.(Puteri, Aliya, and Muhammad, 2018)which will be used as alternative fuel and waste disposal. Therefore, countries have implemented a policy, namely the Deposit Refundable System policy.(Hendra 2016)

A growing number of countries are considering introducing deposit-refund systems. Deposit-refund systems will impact packaging waste recycling rates. The effectiveness of a deposit-refund system depends on its format. The introduction of a deposit-refund system can lead to changes in

the packaging market structure. Well-designed deposit-refund systems are country-specific, time-consuming to implement, and require extensive information campaigns. Deposit-refund systems will always involve expenditures for one of the market participants, while tax breaks can encourage producers to join a non-mandatory deposit-refund system.

In fact, a growing number of countries are considering introducing deposit-refund systems. 2018 brought significant changes in regulations covering waste management and raw material utilization. In January 2018, a plastics strategy was published, while on July 4 of that year, a long-term consultation package on the circular economy (closed-loop) was adopted. Both documents set ambitious targets intended to increase packaging waste collection and recycling efficiency.



Figure 1. Manual Collection on the Deposit Refundable System



Figure 2. Automatic Collection on the Deposit Refundable System

In addition, much research has been done on the results of systems developed in each country.(Linderhof et al. 2019) and there are several review articles in the literature comparing individual systems. According to the general solution, the deposit fee system consists of two parallel methods.

- (1) At the time of purchase, the deposit fee (refundable deposit) is included in the product price, thus representing the financial burden associated with reusing packaging waste.(Septiani et al. 2019)
- (2) To encourage users, a fee is paid to them upon refund. With this system, if the end user recovers their waste, they receive a refundable deposit, which is incorporated into the product price, preventing negative economic impact. The optimal deposit amount is crucial for the system's sustainability. A sufficiently high deposit fee improves collection efficiency, but above a certain value can reduce consumption.

The incentive scheme structure is the same across all schemes; users pay a deposit fee and recover it upon redemption. However, there are differences in the operating environment of each system. For example, Japanese and Chinese scholars distinguish three categories regarding material and money flows.(Zhou et al. 2020) namely (a) reverse logistics mode, as in Germany; (b) retail recycling mode, as in Sweden and (c) repo recycling mode, as in South Australia. It has been

identified that the proper roles and coherence of consumers, traders, recyclers and government are key to the functioning of a deposit refundable system.(Muranko et al. 2021).

In Indonesia, laws and regulations governing waste management, from the national to the regional levels, already exist. The primary legal basis for waste management in Indonesia is Law of the Republic of Indonesia No. 18 of 2008 concerning Waste Management (Law 18/2008, or the Waste Management Law). To further elaborate and implement the provisions of this Law, several derivative regulations were then established, including Government Regulation of the Republic of Indonesia No. 81 of 2012 concerning the Management of Household Waste and Waste Similar to Household Waste (PP 81/2012) and Government Regulation of the Republic of Indonesia No. 27 of 2020 concerning the Management of Certain Waste (PP 27/2020). Although these legal instruments may have different specific provisions due to the different types of waste they handle, in principle, they all have a uniform framework derived from the rules established in Law 18/2008.



Figure 3. Indonesia's position in terms of global waste problems.

Indonesia currently ranks second in terms of global waste production, followed by China as the leading waste producer. The Indonesian government has planned to reduce plastic waste by 70% by 2025, one of the steps being packaging recycling.

Recycling and reuse of product packaging and containers are commonplace in most developed economies today. Deposit-refund systems require consumers to pay a deposit, which is then refunded when the consumer returns the reusable portion of the commodity. By influencing the demand for packaged goods, deposit-refund systems can influence the behavior of both firms and consumers. Many governments have enacted legislation to promote recycling as part of broader efforts to reduce waste management and preserve the environment. A study of solid waste disposal by Palmer et al. found deposit-refund systems to be the least expensive among all other pricing policies, demonstrating the optimality of deposit-refund systems in a general equilibrium framework. Deposit-refund systems charge consumers only when the product is discarded, thus impacting waste reduction at source and also through recycling. In contrast, other policies, such as upfront disposal fees or recycling subsidies, only affect the source or recycling. (Kulshreshtha and Sarangi, 2019)

A deposit refund system is an economic instrument in which a country or individual must pay a sum of money in advance to guarantee that the country or individual will not pollute or that the country or individual will fulfill an obligation, in order to facilitate product take-back.(Wibowo 2022) Once the deposit has been made, the funds will be returned to the state or the user. This system allows waste products that could pollute the environment, such as lead and plastic, to be recycled and extracted for reuse.

Several theoretical studies have investigated the effectiveness of deposit-refund systems as a means of reducing waste disposal and have compared these policies with alternatives, such as waste disposal fees, raw material taxes, return mandates, product taxes (often referred to as upfront disposal fees), recycling subsidies, and recycled content standards. Previous researchers have constructed models in which consumer products are produced using virgin and secondary materials, with solid waste remaining as a byproduct of consumption. These mass-balance models suggest that when solid waste disposal in the private market is unpriced, the private market equilibrium results in too much waste and too little recycling relative to producers using too many raw material inputs in production relative to secondary materials.

Several studies have shown that a deposit-refund policy can achieve a social optimum in this setting, efficiently controlling both legal and illegal waste disposal (These studies also show that other policies are unnecessary, including taxes or subsidies on production inputs. Several studies have also shown that the alternative deposit-refundable system is inferior. Neither a virgin material

tax nor a recycling subsidy can achieve a social optimum. A recycled content standard also cannot achieve a social optimum unless combined with taxes on labor and consumption. And the optimal tax rate in this case is complex and depends on the shape of the production function.

A simple waste and recycling model using 1990 US waste measurement parameters of waste disposal volume, amount of recovered materials, prices of secondary and final materials, and estimates of the price elasticities of supply and demand for 18 individual materials found that deposit-refund could achieve a specified waste reduction target at approximately half the marginal social cost of a recycling subsidy or an upfront disposal fee. Although the upfront disposal fee system leads to source reduction, it reduces the volume of materials and products produced, but fails to encourage recycling. Conversely, recycling subsidies increase recycling but, by lowering production costs (the subsidy makes secondary materials cheaper), actually increase the volume of products produced. Deposit-refund provides an incentive for source reduction and recycling.

RESEARCH METHODS

This research employs qualitative writing methods. Data were collected through literary studies and empirical research, with the aim of writing through a literature review that examines written sources related to the implementation of the refundable deposit system in Indonesia. From a juridical-normative perspective, this research utilizes secondary data in the form of previous research explaining the effectiveness of the legal system in waste management and environmental protection efforts in Indonesia. This study also utilizes laws and regulations related to waste management and the refundable deposit system in force in Indonesia.

RESULTS AND DISCUSSION

Deposit Refund Systems as an Economic Instrument for Environmental Law Compliance

Deposit-refund systems combine a tax on product consumption with a rebate when the product or its packaging is returned for recycling. Deposit-refunds are used for beverage containers, lead-acid batteries, motor oil, tires, various hazardous materials, electronics, and more. Furthermore, researchers have shown that this approach can be used to address many environmental issues beyond waste disposal. By charging upfront costs for consumption and mitigation activities, deposit-refunds may be able to efficiently control pollution in a manner similar to Pigovian taxes.

Theoretical models have shown that alternative waste disposal policies, such as virgin material taxes, upfront disposal fees, recycled content standards, and recycling subsidies, are inferior to deposit refunds. These results have been corroborated in calibrated models of US waste and recycling. In theoretical models that consider shared environmental concerns and product design considerations, deposit refundable systems continue to be recommended as a component of a socially optimal policy suite. More empirical research is needed into deposit-refund systems, particularly upstream systems used for many products. In these systems, processors or collectors of recyclables, rather than consumers, receive the refund. Upstream systems may have lower transaction costs and better environmental outcomes than traditional downstream systems.

However, the refundable deposit system has three potential advantages, namely:

- (1) Preventing the problem of midnight dumping often associated with Pigovian taxes is a particularly serious issue in the case of solid and hazardous waste disposal. When legal dumping is directly taxed, households and businesses seek alternative disposal options, including incineration and illegal dumping, if they are convenient or carry minimal penalties. A refundable deposit system approach can avoid this problem by offering rebates for materials returned for recycling.
- (2) Directly taxing waste is ineffective due to the difficulty of monitoring it, so refunds applied to bottles, packaging, plastic bags, and other products that frequently end up as waste may be appropriate. In this regard, it is possible that a more easily monitored sales tax (deposit) combined with subsidies (refunds) for appropriate mitigation activities could provide some tax incentives without the need for policies to monitor individual pollutants.
- (3) Tax evasion and avoidance are less of a problem with a deposit-refund system.

It is difficult to evade taxes on product sales. Households and firms therefore invest in generally profitable activities to increase their returns, rather than in harmful activities to avoid paying taxes. An upstream deposit-refund system, where the refund is paid to the processor of recyclable materials or to the collector of the materials after delivery to the processor, rather than downstream to the consumer who returns the materials to the collection center, may be particularly beneficial in this regard.

Producer involvement in the waste management cycle is crucial to ensure a progressive approach to all-sector efforts to expand and intensify waste management efforts in Indonesia. Their role is regulated by Regulation No. 75 of 2019 of the Ministry of Environment and Forestry of the Republic of Indonesia concerning the Roadmap for Waste Reduction by Producers (MEF Regulation 75/2019).

MEF Regulation 75/2019 adopts the spirit of the Extended Producer Responsibility (EPR) Principle. In the Regulation, the term “producer” is defined as “a business actor that produces, distributes (including imported goods), or sells goods in packaging or containers that cannot or are difficult to decompose by natural processes.” The reduction mechanism in MEF Regulation 75/2019 is specifically designed to address products, product packaging, and/or containers that:

- (a) difficult to decompose in natural processes;
- (b) cannot be recycled; and/or
- (c) cannot be reused, including those made of plastic

Implementation of the Deposit Refund System in Indonesia

In Indonesia, laws and regulations governing waste management exist, from the national to the regional levels. The primary legal basis for waste management in Indonesia is Law No. 18 of 2008 concerning Waste Management (UU 18/2008, or the Waste Management Law). In reality, many companies are unable to pay court-ordered compensation.

In subsequent developments, all waste reduction and management efforts stipulated in laws and regulations were then directed to achieve the targets outlined in the National Policy and Strategy for Household Waste and Household-Similar Waste Management (Jakstranas) which was promulgated through Government Regulation of the Republic of Indonesia No. 97 of 2017 (PR 97/2017). Jakstranas is Indonesia's main waste management plan that will be implemented within the 2017–2025 period. Looking further, Article 14 of PP.No. 81 of 2012 concerning the Management of Household Waste and Waste Similar to Household Waste broadly explains that:

- 1) Manufacturers are required to manage packaging that cannot or is difficult to decompose by natural processes and
- 2) Manufacturers are required to reuse waste by recycling product packaging.

The explanation above is in accordance with the provisions of Article 42 paragraph (1) of Law No. 32 of 2009 concerning Environmental Protection and Management, which states that: "In order to preserve environmental functions, the Government and Regional Governments are required to develop and implement Environmental Economic Instruments," following up on this matter, PP No. 46 of 2017 elaborates in detail regarding Environmental Economic Instruments.(Kurnia, Azzahra, and Aretha 2020)

At the regional government level in Indonesia, provinces and districts/cities, several tasks and functions are mandated in the field of waste management. These authorities and functions are delegated by related instruments including Law 18/2008, the Regional Government Law (Law No. 23 of 2014 (revised)), and the Environmental Protection and Management Law (Law No. 32 of 2009 (revised)) and Article 28H paragraph (1) of the 1945 Constitution which states "Everyone has the right to live in physical and spiritual prosperity, to have a place to live, and to have a good and healthy living environment and the right to receive health services." Which then becomes the basisConstitutional for a green constitution with economic instruments. It implements a polluter pays principle, an economic policy to internalize the costs of pollution or environmental damage. The implementation of a deposit refund system in Indonesia should build on existing practices in other countries and underscore government environmental laws and regulations. For Indonesian policymakers, this insight can be crucial, as there may be valid reasons for different deposit rates for some containers or materials. A larger deposit for larger containers, for example, could correct misaligned incentives where consumers are tempted to purchase larger bottles to pay a smaller deposit, or where certain materials may be more likely to require reclamation due to their value (aluminum) or environmental impact (plastic).(Rossetti, 2022)The implementation of a policy is of course aimed at enabling the country to minimize the amount of waste and benefit from the waste itself.

Legal Solutions for Optimizing the Deposit Refund System in Indonesia

1. Strengthening and Harmonization of Regulations (DRS Legal Basis)

Indonesia has a primary legal framework for waste management through Law Number 18 of 2008 concerning Waste Management (Law 18/2008). This law emphasizes the importance of waste reduction and management based on the principle of shared responsibility, and encourages the implementation of economic instruments based on the

polluter pays principle as the basis for DRS. For further implementation, Government Regulation (PP) Number 81 of 2012 concerning the Management of Household Waste and Household-Similar Waste (PP 81/2012) and Government Regulation Number 27 of 2020 concerning the Management of Certain Waste (PP 27/2020) were issued.

However, the regulation does not specifically address DRS for various types of packaging and products. Legal solutions that need to be implemented include:

- a. Preparation of Government Regulations (PP) or special Ministerial Regulations regarding DRS which regulate in detail:
 1. Types of products/packaging that require DRS (e.g.: plastic bottles, cans, batteries, electronics)
 2. Deposit amount and refund mechanism
 3. Deposit fund governance, supervision, and reporting
 4. Rights and obligations of producers, distributors, consumers and recycling managers.
- b. Harmonization of central and regional regulations to prevent overlapping policies and provide space for adaptation based on local conditions, but still within the national framework.
- c. Regulation adjustments to technological developments, such as the recognition of digital-based DRS and reverse vending machines (RVM) as automatic refund tools.

2. Enforcement of the Extended Producer Responsibility (EPR) Principle and Producer Obligations

DRS is a manifestation of the principle *Extended Producer Responsibility*(EPR) which has been accommodated in PP 27/2020. In DRS, manufacturers are required to:

- a. The obligation to recall post-consumer packaging or products and provide transparent and accessible collection points and refund systems is at the heart of the implementation of the deposit refund system in Indonesia. Based on Law No. 18 of 2008 concerning Waste Management and Government Regulation No. 81 of 2012 and Government Regulation No. 27 of 2020, producers are required to be responsible for the packaging or products they distribute until the post-consumer stage. This aligns with the Extended

Producer Responsibility (EPR) principle adopted in the national waste management policy.

b. Establish a DRS management institution or consortium that is responsible for managing deposit funds, distributing refunds, and reporting to the government. This institution should be independent and involve various stakeholders, such as government representatives, producers, recycling businesses, and community members. Its primary functions include:

- (1) manage deposit funds in a transparent and accountable manner
- (2) ensure that refund distribution is efficient and on target
- (3) conduct audits and financial reporting that is accessible to the public and
- (4) coordinate with the government regarding the evaluation and development of the DRS system.

The DRS management institution must also be able to integrate digital systems for transaction recording and reporting, so that the monitoring and accountability processes can be properly maintained. The establishment of a professional and transparent DRS management institution has proven to be the key to success in various developed countries, such as Germany and the Netherlands, which have been able to increase packaging return rates to above 90%. With a clear and accountable management institution, it is hoped that the DRS system in Indonesia can run optimally, increase community participation, and contribute significantly to waste reduction and sustainable environmental protection.

c. Imposing administrative, civil, and even criminal sanctions on producers who fail to comply with the deposit refund system (DRS) is a crucial legal instrument to ensure the effectiveness and compliance of this system in Indonesia. Under Law No. 18 of 2008 concerning Waste Management, producers are legally responsible for managing the waste generated from their products, including the obligation to recall post-consumer packaging and transparently manage deposit funds. If producers do not fulfill these obligations, they may be subject to administrative sanctions in the form of revocation of business permits or fines, as regulated in Government Regulation Number 81 of 2012 and PP Number 27 of 2020. In addition to administrative sanctions, producers may also be subject to civil sanctions, such as lawsuits for damages from

parties harmed by negligence in waste management or the implementation of the DRS. These lawsuits can be filed by the public, environmental organizations, or local governments, as stipulated in Law Number 32 of 2009 concerning Environmental Protection and Management. In fact, in certain cases that cause significant environmental damage, producers can be subject to criminal sanctions, such as imprisonment and fines, as stipulated in Articles 104 to 116 of Law 32/2009. The implementation of these sanctions is a concrete manifestation of the polluter pays principle, which emphasizes that parties who cause pollution or environmental damage are obliged to bear the costs of restoration and are legally responsible. With the threat of strict and graduated sanctions, it is hoped that producers will be more disciplined and responsible in implementing DRS, so that the goals of waste reduction and environmental protection can be optimally achieved.

- d. Providing fiscal and non-fiscal incentives for active and innovative producers implementing the deposit refund system (DRS) is an important strategy to encourage industrial sector involvement in waste reduction and recycling efforts in Indonesia. Fiscal incentives can include tax reductions, exemptions from import duties on recycling machinery or technology, and streamlined business licensing processes related to waste management or recycling. Meanwhile, non-fiscal incentives can be provided in the form of awards, environmentally friendly certification, priority in government procurement of goods/services, and support for the promotion of environmentally friendly products. The basis for providing these incentives can be found in Law Number 18 of 2008 concerning Waste Management, which, in Article 44, states that the government can provide incentives to anyone who reduces, reuses, and recycles waste. Government Regulation Number 81 of 2012 and Government Regulation Number 27 of 2020 also open up space for central and regional governments to provide incentives to producers who play an active role in managing packaging waste through the DRS system.

3. Strengthening Institutions and Supervisory Systems

In order for DRS to run effectively and accountably, it is necessary:

- a. The establishment of an independent National DRS Management Agency is a key pillar in ensuring an effective, transparent, and accountable deposit refund system in

Indonesia. This agency acts as a central institution responsible for managing all deposits collected from consumers upon product purchases and ensuring that refunds are appropriately redistributed to those who return packaging or post-consumer products.

- b. A transparent reporting and auditing system is a key element in effective and publicly trusted deposit refund system (DRS) governance. In this context, the involvement of external auditors and the publication of publicly accessible periodic reports are crucial to ensure accountability, prevent misappropriation of deposit funds, and enhance public and stakeholder trust. A transparent reporting system can be achieved by requiring DRS management institutions or bodies to prepare periodic financial and operational reports, for example every three or six months. These reports must include information on the amount of deposit funds collected, the amount of refund funds distributed, and a breakdown of operational and system management costs. To ensure this reporting is truly accountable, DRS management institutions are required to engage an independent external auditor to audit all financial and operational transactions. In Indonesia, the urgency of transparent reporting and auditing is also mandated by Law Number 18 of 2008 concerning Waste Management, and reinforced by Government Regulation Number 81 of 2012 and Government Regulation Number 27 of 2020, which require every environmental fund manager to report and account for the use of funds transparently to the government and the public. Thus, the implementation of a transparent and publicly accessible reporting and audit system is a strategic step to ensure the sustainability, effectiveness, and integrity of DRS implementation in Indonesia.
- c. Cross-sector coordination between the Ministry of Environment and Forestry (KLHK), the Ministry of Industry, the Ministry of Finance, and local governments is fundamental to supporting the successful implementation of the deposit refund system (DRS) in Indonesia. This coordination is necessary to ensure that all policies, programs, and regulations related to waste management and DRS implementation are integrated, efficient, and non-overlapping. The KLHK serves as the primary regulator and overseer of DRS policy implementation, including the development of technical standards, environmental oversight, and public education and outreach. The Ministry of Industry

plays a key role in encouraging innovation in the recycling industry and ensuring that producers comply with DRS provisions throughout their production chain. The Ministry of Finance plays a strategic role in managing deposit funds, providing fiscal incentives, and overseeing the flow of refund funds. Meanwhile, local governments are responsible for technical implementation in the field, from providing collection point infrastructure and operational oversight to providing local education. This cross-sector coordination must also be realized through the establishment of national and regional coordination forums or teams involving all stakeholders, including producers, recycling businesses, the informal sector, and civil society. This forum is tasked with developing a joint action plan, addressing implementation barriers, and conducting periodic system evaluations and improvements.⁵ With effective coordination, it is hoped that the DRS policy can be implemented consistently and effectively, and have a tangible impact on waste reduction and environmental protection in Indonesia.

Optimizing legal solutions for implementing the deposit refund system in Indonesia requires strengthening comprehensive regulations, establishing independent and accountable institutions, and effective cross-sectoral coordination between the central and regional governments and all stakeholders. The application of strict sanctions, incentives, transparent reporting, and ongoing education and outreach are key supporting factors for the effective and sustainable operation of this system. These efforts are expected to encourage changes in producer and community behavior, increase packaging return rates, and achieve more responsible and environmentally conscious waste management in Indonesia.

CONCLUSION

Among the powers held by the government is intended to establish policies and strategies. In connection with its authority to establish waste management policies and strategies within its territory, several regulations have been issued by regional governments specifically aimed at addressing the circulation and generation of plastic and/or plastic waste within their territories. In principle, Indonesia implements an economic instrument in the application of the refundable deposit system, a manifestation of the polluter pays principle, an economic policy to internalize the costs of pollution or environmental damage.

In Indonesia, laws and regulations governing waste management, from the national to regional levels, already exist in Indonesia. The main legal basis for waste management in Indonesia is Law of the Republic of Indonesia Number 18 of 2008 concerning Waste Management (Law 18/2008, or the Waste Management Law). The provisions of Article 42 paragraph (1) of Law No. 32 of 2009, Article 14 of Government Regulation No. 81 of 2012, where the enactment of these regulations, show that the Indonesian Government has at least taken a major initial step in addressing the waste problem, establishing it in a binding legal instrument. Not only determining good excise/tax rates, the preparation of this policy must be seen as a comprehensive cultural change. The key to the success of implementing this policy is the support of all related parties which requires coordination from the design stage from key stakeholders including the Ministry of Environment, Ministry of Social Affairs, Ministry of Finance, local governments, officials and others to ensure the implementation of the refundable deposit system policy in the long term.

A legal solution to optimize the deposit refund system in Indonesia requires strengthening more specific and harmonized regulations, particularly through the development of derivative regulations that technically govern the implementation of the DRS for various types of packaging and products. Strict implementation of the Extended Producer Responsibility (EPR) principle, the establishment of an independent national DRS management agency, and a transparent reporting and auditing system are the main foundations for this system to run effectively and accountably. Cross-sector coordination between relevant ministries and local governments, the imposition of strict sanctions for violators, and incentives for active and innovative producers are also essential to increase compliance and participation. With the support of education, outreach, and ongoing monitoring and evaluation, it is hoped that the deposit refund system can contribute significantly to waste reduction, increased recycling, and environmental protection in Indonesia.

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