



## STRATEGIC PARTNERSHIPS IN THE IMPLEMENTATION OF BONDED RECYCLING ZONES TO SUPPORT CIRCULAR ECONOMY IN BANTEN, INDONESIA

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### Abstract

The purpose of this study is to explore the strategic partnerships role of Bonded Recycling Zones (KDUB) in facilitating Indonesia's transition to a circular economy and enhancing sustainable development. Utilizing a qualitative research approach, the study employs in-depth interviews with key stakeholders from various government agencies and the recycling industry, alongside a comprehensive analysis of policy documents. The findings reveal significant opportunities within the KDUB framework, yet also highlight critical gaps in inter-agency coordination, particularly in monitoring and evaluation processes, which are vital for aligning recycling practices with national strategic objectives and environmental standards. The research also underscores the positive impact of fiscal incentives on the recycling sector, while identifying the necessity for more efficient licensing procedures and clearer regulatory guidelines. This study offers original insights into the complexities of policy implementation in the context of circular economy initiatives, providing valuable recommendations for enhancing the effectiveness of KDUB policies and fostering stronger governmental collaboration.

**Keywords:** Coordinated border management, Customs and tax cooperation, Environment, Fiscal incentives, Waste management

### INTRODUCTION

The circular economy is an increasingly prominent global issue, driven by the imperative to manage waste in a manner that sustains ecosystems. The critical importance of transitioning to a circular economy is reflected in numerous global policies and resolutions. A key affirmation of the circular economy concept is articulated in UNEA Resolution 4, specifically Resolution 1 (UNEP/EA.4/Res.1), which defines the circular economy as a sustainable economic model wherein products and materials are designed to be reused, remanufactured, recycled, or recovered. This approach aims to keep resources within the economy for as long as possible, while minimizing waste generation—particularly hazardous waste—and reducing greenhouse gas emissions (United Nations Environment Assembly of the UNEP, 2019).

According to the OECD (2015), governments can facilitate the shift from a linear to a circular economy through economic incentives. In line with this, the Ellen Mc Arthur Foundation (2021) and Bappenas (2021) outline the implementation of tax incentives in Europe, advocating for tax and excise reductions for businesses adopting low-carbon energy usage. Sixteen European Union countries offer tax incentives to support renewable energy and the circular economy. These measures include exempting electricity generated from taxes (Germany, Romania, Slovakia, Denmark, Sweden, and Poland), reducing taxable profits for companies using renewable energy (Belgium, Greece, the Czech Republic, and Spain), and applying lower VAT rates for businesses utilizing renewable energy (France, Portugal, and Italy). Furthermore, the World Customs Organization (WCO)—the leading global customs organization—has, since 2020, highlighted the role of customs institutions in promoting sustainability for people, prosperity, and the planet. The most recent action in 2023 includes the publication of a study report titled “Transition to a Circular Economy and Implications for Customs Administrations.”



To support the circular economy, the Indonesian government, through Government Regulation (PP) No. 32 of 2009 as amended by PP No. 85 of 2015, has introduced the concept of a circular economy via Bonded Recycling Zones (KDUB) under the authority and supervision of the Directorate General of Customs and Excise. KDUB serves as a bonded warehouse where imported goods can be stored for a certain period, during which recycling activities of both imported and locally sourced waste are conducted to produce goods with higher added value and economic significance. KDUB offers both fiscal and non-fiscal incentives to recycling entrepreneurs. Fiscal incentives for imported goods include the suspension of import duties and exemption from taxes in the context of importation (PDRI), while locally sourced goods are exempt from VAT and luxury goods tax (PPnBM). Non-fiscal incentives include automated import notifications, on-site customs inspection services, and IT-based supervision. Recycled goods/materials from KDUB that are exported are exempt from import duties and benefit from a zero percent VAT rate, while those delivered to the local industry are subject to import duties, excise, and PDRI.

Shifting to a Circular Economy (CE) is a multifaceted process that demands active participation from multiple societal levels and stakeholders (Ekvall et al., 2016). Using a single policy tool is likely to address only one dimension, potentially missing out on a comprehensive solution (Wilts H & O'Brien, 2019). Thus, a well-rounded strategy is required, integrating various policies to cover the different aspects of transitioning to a CE (Milios, 2021). The government assumes three primary roles in the development and execution of CE policies: as promoters, facilitators, and enablers (Ministry of National Development Planning/Bappenas, 2023; OECD, 2021; Lacy et al., 2020). In their role as promoters, the government can define the responsibilities and roles within policymaking, formulate strategies with clear visions, objectives, targets, and priorities, and share information about the advantages of CE and its current progress. Acting as facilitators, the government can promote coordination across different governmental levels, support collaboration and dialogue between the public sector, non-profits, and businesses to drive innovation, and enhance connections between urban and rural areas. In their enabling role, the government can offer incentives to foster innovation and economic growth, support CE-related training and education, and create an evaluation system that is consistently updated and publicly accessible.

Wahyudi et al. (2023) proposed a framework for customs' transition to CE that suggested that external elements such as CE policies and CE stakeholders collaboration/participation are essential to implement government roles as promoters, facilitators, and enablers. Ministry of National Development Planning/Bappenas (2023)b (Bappenas) has issued a report on Stakeholder Mapping and Recommendations for Circularity Innovation Diffusion to Support the Circular Economy Transition in Indonesia. Bappenas identified government institution as controller of waste management as follows: Coordinating Ministry for Maritime and Investment Affairs, Ministry of Environment and Forestry, Ministry of Industry, Coordination Team for Marine Debris Management, Agencies for Regional Development, and Ministry of Finance. The role of the Ministry of Finance, through the Center for Climate Finance and Multilateral Policy, is to support the financing of energy needs through the advancement of renewable energy sources. However, their survey and desk research showed that several government institutions such as Coordinating Ministry for Maritime and Investment Affairs, Coordination Team for Marine Debris Management, and several Agencies for Regional Development, have not yet established policies related to the circular economy, and there was no evident coordination in place for preparing the transition to a circular economy.

In addition to the issue of inadequate coordination among institutions during the transition to a circular economy, the role of Customs in facilitating bonded recycling zones as



part of this transition has not been clearly identified in the mapping conducted by Bappenas. The Directorate of Customs Facilitation, Directorate General of Customs and Excise (2020), has pointed out that the technical regulations concerning the implementation of bonded recycling policies have yet to be advanced due to significant public concerns. These concerns revolve around the potential misuse of KDUB facilities for the illegal importation of non-hazardous waste (non-B3), which could lead to negative environmental and health impacts, as well as the lack of intensive cross-ministerial coordination to establish effective waste management governance.

As one of the key policies in recycling as part of the circular economy, the existing coordination between stakeholders has been deemed suboptimal in facilitating the implementation of bonded recycling zones for the domestic industry. Although an overarching regulation for bonded recycling zones (KDUB) has been in place since 2009, its lack of technical implementation highlights the ongoing coordination challenges among stakeholders. Consequently, this study aims to contribute by proposing a partnership strategy for the successful implementation of bonded recycling zones (KDUB) as an integral component of plastic waste management. Previous research has primarily explored the circular economy from various perspectives: the proposed circular economy frameworks in specific countries (Wahyudi et al., 2023; Rukanova et al., 2022), the impact of fiscal and non-fiscal interventions to support the circular economy on macroeconomics and the environment (Brusselaers et al., 2022), CE modeling using input-output data, social accounting matrix, or CGE (Donati et al., 2020; Mala and Maridati, 2018), and cost-benefit analysis of CE implementation (Ramos et al., 2022). In practice, CE implementation in developing countries like Indonesia remains hindered by technical regulations and inter-agency coordination. This study seeks to address this research gap by focusing on the upstream processes of CE implementation, specifically the strategic coordination necessary to advance the circular economy, with a particular emphasis on recycling in Indonesia.

This study narrows its scope to the recycling of plastic waste, paper, and metal scrap specifically within the Province of Banten. The rationale for this focus is that the demand for plastic waste is significantly higher compared to other types of waste, such as electronic waste. In 2023, the demand for plastic waste reached 9,942,798 tons (Directorate of Chemical and Pharmacy Ministry of Industry, 2023), which is considerably higher than the demand for electronic waste, which was only 1,886,000 tons (United Nations Institute for Training and Research, 2024). Banten was chosen as the research locus because it has the lowest regional economic growth rate on the island of Java, at 4.6 percent, which is below the national economic growth rate of 5 percent and the average regional economic growth rate for Java of 4.87 percent (Regional Chief Economist Forum, 2024). Given these economic conditions, the presence of 18 bonded recycling companies in Banten, accounting for 14 percent of the total recycling companies in Indonesia, and ranking fourth after East Java, Batam, and Central Java (Directorate of Chemical and Pharmacy Ministry of Industry, 2023), is expected to stimulate regional economic growth. It is crucial to identify partnership strategies that can optimally support the theoretical and practical implementation of bonded recycling zones. Therefore, purpose of this study is to explore optimal strategic partnerships that can support the recycling industry in Banten, with the potential to advance the circular economy and stimulate economic growth in the region.

## **LITERATURE REVIEW**

### **Public Policy Theory and Policy Implementation**

Public policy is commonly defined as a planned course of action by an individual, group, or government within a specific context, aiming to navigate challenges and seize opportunities



to achieve a particular goal or fulfill an objective (Friedrich, 1967). Public policy transcends individual or narrow interests, focusing instead on collective goals, public welfare, or the broader citizenry. The course of action that constitutes policy is executed through subsequent decisions and activities. According to Lester (as cited in Wibowo & Tangkilisan, 2004), public policy can be understood as a process or sequence of government decisions or actions intended to address public issues, whether those issues are actual or still conceptualized.

According to Ripley (as cited in Mutiarin et al., 2018), policy implementation is “*what happens after laws are passed authorizing a program, a policy, a benefit, or some kind of tangible output.*” The definition outlines a sequence of activities that follow the articulation of a program's objectives and the desired outcomes as defined by government officials. Implementation encompasses both actions and inactions undertaken by a range of actors, particularly the bureaucrats responsible for designing and executing the program, leading up to the realization of its effects. Policy implementation is a series of activities that consist of operational stages as follows:

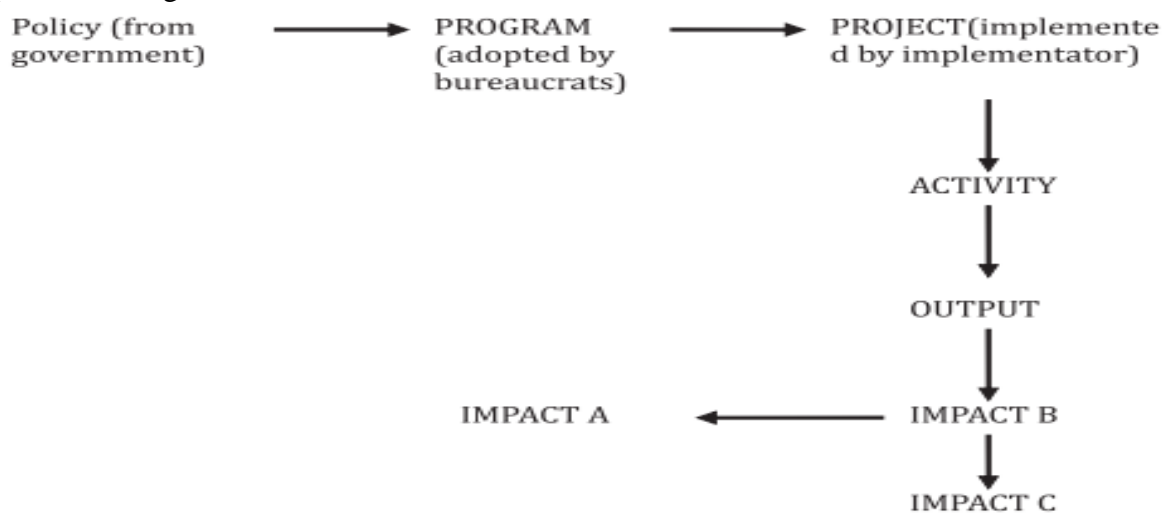


Figure 1 Policy Implementation Operational Stages  
Source: Mutiarin et al. (2018)

The implementation of any program is influenced by various elements, each dependent on the specific programs and the distinct interests of the actors involved, who seek to fulfill their objectives by influencing allocation procedures. As a result, implementation becomes increasingly fragmented, both geographically and organizationally, complicating the execution of a given program, particularly with the growing involvement of multiple decision-making entities. It is crucial that decisions made during policy formulation clearly identify those responsible for executing various aspects of the program, as these decisions significantly impact how the policy is ultimately realized. For instance, there are disparities in the capacities of different bureaucratic agents to effectively manage the program; while many are active, skilled, and dedicated, others may experience significant pressure from political elites, have substantial access to resources, or simply accommodate the demands placed upon them.

#### **Factors Influencing Policy Implementation - Theory by Donald S. Van Meter and Carl E. Van Horn (1975)**

Meter and Horn identify five key variables that influence the effectiveness of policy implementation: (1) standards and policy targets, (2) resources, (3) inter-organizational communication and capacity building, (4) characteristics of implementing agents, and (5) the socio-economic and political context (Figure 2).

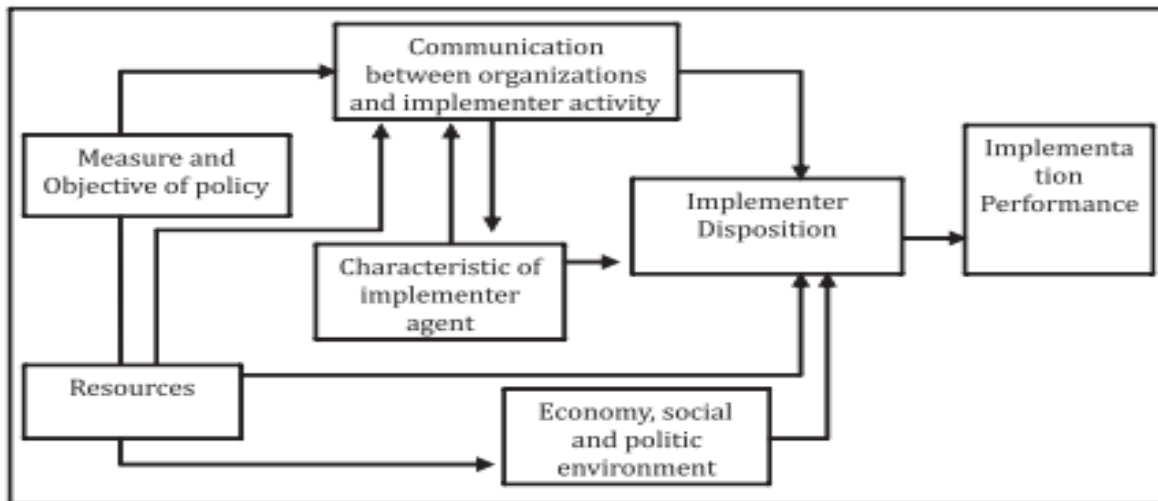


Figure 2. Policy Implementation Model by van Meter and van Horn

Source: Van Meter and Horn (1975) as cited in Mutiarin et al. (2018)

- (1) Standards and Policy Targets: The standards and targets set for a policy must be clear, measurable, and specific to ensure they can be effectively operationalized. Ambiguity in these targets can lead to multiple interpretations and conflicts among the implementing agents.
- (2) Resources: Successful policy implementation requires adequate resources, both human and non-human. In many instances of government programs, the availability and proper allocation of resources are critical.
- (3) Inter-organizational Relationships: The implementation of many programs necessitates collaboration and coordination with other agencies. Therefore, strong inter-agency communication and cooperation are essential to the success of a program.
- (4) Characteristics of Implementing Agents: The characteristics of implementing agents encompass the bureaucratic structure, norms, and relational dynamics within the bureaucracy, all of which significantly influence the effectiveness of program implementation.
- (5) Social, Political, and Economic Conditions: This variable includes the broader environmental and economic resources that can facilitate successful policy implementation. It also considers the extent of support from interest groups, the stance of participants—whether supportive or oppositional—the prevailing public opinion, and the level of backing from public elites.
- (6) Implementer Disposition: Implementer disposition involves three critical aspects: (a) the implementer's attitude towards the policy, which affects their willingness to execute it; (b) their cognitive understanding of the policy; and (c) the intensity of their disposition, which refers to the value preferences held by the implementer.

### **Government policies and regulation as key factor supporting recycling industries**

Researchers have devoted considerable attention to the impact of government policy and regulation on the recycling and reuse of plastic waste (Li et al., 2016; Directorate of Customs Facilitation, Directorate General of Customs and Excise (2020). For instance, Troschinetz & Mihelcic (2009) investigate the factors affecting plastic recycling within municipal solid waste across 19 developing nations, concluding that governmental policies and financial mechanisms play a pivotal role in ensuring the sustainability of plastic recycling efforts within municipal waste management systems.

In examining waste management systems in Sweden, Zaman (2013) highlights the social, economic, and environmental factors driving municipal waste management, finding that



Sweden's and the European Union's regulations, coupled with innovative municipal waste systems, have significantly increased the recycling rate of polyethylene terephthalate (PET) bottles. The study further illustrates that regulations serve as a crucial tool for promoting, developing, or limiting a system. Similarly, Leal et al. (2019) explore the role of the extended producer responsibility (EPR) principle in plastic waste recycling, noting that the application of this principle to plastic-containing waste streams faces challenges, including a lack of binding mechanisms and insufficient incentives to fully engage enterprises.

Recent academic discussions on the impact of government policies on plastic waste recycling and reuse have increasingly focused on specific policies targeting particular types of plastic and raw materials. For example, Ni et al. (2013) examine the policies and current issues related to polybrominated diphenyl ethers (PBDEs) in China, suggesting that regulatory measures can effectively manage risks associated with PBDEs. Similarly, Cai et al. (2018) investigate the emission behaviors of PBDEs during the pyrolysis process to understand the impact of government interventions. Despite this shift towards more detailed research, most studies on plastic waste recycling tend to treat government subsidies as exogenous variables. However, exploring the dynamic influence of government policy measures on the willingness of multiple stakeholders to engage in plastic waste recycling and reuse not only enriches the theoretical understanding of government policies but also holds significant practical implications.

The process of recycling and reusing plastic waste involves not only collectors (C) and recyclers (R) but also the government (G), which plays a pivotal role by providing policy incentives and overseeing implementation. Collectors are tasked with gathering plastic waste, while recyclers focus on processing this waste for reuse through technological means. The government's role primarily involves fostering the development of the plastic waste recycling and reuse industry by introducing appropriate incentives and penalties.

Incentives can be divided into two categories: subsidy support and policy support. Subsidy support includes income-related incentives provided by the government to companies to encourage plastic waste recycling and reuse, such as recycling subsidies. Policy support pertains to long-term asset-related incentives that reduce the costs per unit of processing plastic waste for collectors and recyclers, such as support for technological innovation. Additionally, the government enforces penalties: if a collector fails to fulfill its duty to collect waste plastic and supply it to authorized recyclers, the government imposes fines, which are then used to compensate the authorized recyclers. Similarly, if a recycler does not properly reuse the plastics provided by collectors through the required technological processes, the government penalizes them, and the fines collected are used to compensate the compliant collectors.

## **METHODS**

The research area were recycling industries of plastic waste, paper, and metal scraps located in Banten Province Indonesia. Primary data were collected through in-depth interviews (IDIs) with Officials from Ministry of Industry, Republic of Indonesia, Ministry of Environment and Forestry, Republic of Indonesia, Ministry of Finance (DG of Customs and Excise and DG of Tax), the Agency of Indonesia National Single Window, and five recycling companies located in Banten, Indonesia.

Table 1. Details of informants.

Informants	
1. Ministry of Industry, Republic of Indonesia	Directorate of Chemical and Pharmacy
2. Ministry of Environment and Forestry, Republic of Indonesia	Directorate of Hazardous and Non-hazardous Waste Management



Ministry of Finance, Republic of Indonesia:

3. Directorate General of Customs and Excise Indonesia
  - a. Directorate of Customs and Excise Facilities, Sub-Directorate of Bonded Zone Facilities
  - b. Directorate of Enforcement and Investigation, Sub-Directorate of Transnational Crimes
  - c. Directorate of Communication and Service User Guidance
4. Directorate General of Tax Indonesia
  - Directorate of Regulation and Taxation I
5. Recycling industries/business in Banten Province
  - Plastic waste commodity:
    - a. HI. Bonded facilities.
    - b. ITG. Publicly traded company.
  - Paper commodity:
    - IKP. Publicly traded company.
  - Metal scraps commodity:
    - LSI. Bonded warehouse facilities.
  - Other:
    - CAP. Publicly traded company.
    - Petrochemical.

The IDIs lasted for 1 to 2 hours each, where all of IDIs were audio-recorded, transcribed in Bahasa Indonesia, and analyzed using QSR Nvivo 14. After data collection, we performed coding using QSR Nvivo 14, a qualitative research software (Richards, 1999). Two strategies were used in the coding process. The first strategy was based on research questions and conceptual framework of ABCGM (academics, business, community, government, and media) or pentahelix model, and the second one was based on the coding process suggested by Miles, Huberman, & Sadana (2014) which includes descriptives, in vivo, process, evaluation, emotion, and values coding. After the coding process was complete, project maps were created as a guide to explain the results of this study.

## **RESULTS AND DISCUSSION**

### **The existing partnerships in administering the bonded recycling policy**

As an active member of the World Customs Organization (WCO), Indonesia's customs administration (DGCE) has adhered to Multilateral Environmental Agreements (MEAs) and treaties under the Green Customs Initiative, engaging in joint enforcement coordinated border management efforts to protect human health and the environment from the adverse effects of hazardous waste. These include the Basel Convention, Rotterdam Convention, CITES, Montreal Protocol, WCO Operation DEMETER, and WCO CENcomm. At the national level, the implementation of MEAs is reflected in various regulations primarily issued by the Ministry of Agriculture, Ministry of Trade, and Ministry of Environment and Forestry.

Based on the coding of IDI results, the scope of partnership can be categorized into six clusters as shown in Figure 2, with numbers indicating the sequence of activities. In the scope of permits or licensing (Activity 1), Customs shares overlapping functions with the Tax Authority, Ministry of Industry (MOI), and Ministry of Environment and Forestry (MOFE), which can be developed into strategic partnerships to streamline the licensing process for businesses. Customs overlaps with the Tax Authority in that businesses applying for KDUB facilities must have registered as Taxable Entrepreneurs and submitted their most recent Annual Income Tax Return, if required. Additionally, Customs and Tax have overlapping partnerships in Activity 5, related to fiscal and non-fiscal incentives, where goods entering Bonded



Recycling Zones from Bonded Storage Facilities are granted import duty suspension and/or exemption from import-related taxes (Fig. 3).



Fig. 2. Scope of existing partnerships in administering bonded recycling policy

Customs and the Ministry of Industry (MOI) have overlapping activities in the issuance of permits/ licensing and production/recycling process. To qualify for the Bonded Recycling Zone (KDUB) facilities, businesses must meet a set of established criteria. These requirements are designed to ensure that only companies meeting specific standards can benefit from these facilities. Additionally, the fulfillment of these criteria aims to maintain compliance with government regulations and environmental standards, ensuring that recycling activities are not only economically beneficial but also sustainable. The conditions for businesses applying for KDUB facilities are as follows:

1. Possession of proof of ownership or control over an area, site, or building with clearly defined boundaries, including location maps and layout plans designated as Bonded Recycling Zones.
2. Location within an industrial area specifically designated for recycling activities.



Fig. 3. Mutual activities in government partnerships within the recycling industry

Notes: MOFE – Ministry of Forestry and Environment; MOI – Ministry of Industry

Customs and the Ministry of Forestry and Environment (MOFE) have overlapping activities in the issuance of permits/ licensing and raw material input. To qualify for the Bonded Recycling Zone (KDUB) facilities, businesses must meet specific established criteria. These requirements are designed to ensure that only companies adhering to certain standards can access these benefits. Moreover, these criteria aim to ensure compliance with government regulations and environmental standards, making sure that recycling activities are not only economically viable but also sustainable. The conditions for businesses seeking KDUB facilities include the following:

1. Located within an industrial zone specifically designated for recycling;



2. Possesses a Recycling Business Permit, Recycling Industry Business Permit, Environmental Documents, and other required licenses from relevant technical authorities;
3. Receives a recommendation from the minister responsible for environmental affairs;
4. Holds certification as an importer of non-hazardous and non-toxic (non-B3) waste.

### **Operational provisions**

Operators of Bonded Recycling Zones and businesses within these zones must process raw materials in the form of non-hazardous and non-toxic (non-B3) waste brought into the zone within a maximum period of three months from the date of entry. The criteria for raw materials in the form of non-hazardous and non-toxic (non-B3) waste include:

1. Sorted solid waste;
2. Not classified as hazardous and toxic waste;
3. Not household waste, waste similar to household waste, or specific waste;
4. Not in liquid, dust, sludge, paste, or sludge form, and not contaminated with hazardous and toxic waste; and Waste that has been cut, crushed, or altered into an environmentally friendly form.

Operators of Bonded Recycling Zones and businesses within these zones are required to control environmental pollution in accordance with environmental regulations. If the processing activities generate additional waste, the operators and businesses must further manage this waste in compliance with environmental legislation.

Waste is the byproduct of an activity or operation. According to Article 69, paragraph (1), letter c of Law No. 32 of 2009 on Environmental Protection and Management, it is stated that "*Everyone is prohibited from bringing waste originating from outside the territory of the Republic of Indonesia into the environmental media of the Republic of Indonesia.*" This prohibition aims to protect the environment from potential hazards and pollution that could result from the importation of foreign waste. However, to enhance the business climate, national competitiveness, and business certainty, the government has made exceptions for certain types of non-hazardous and non-toxic (Non-B3) waste imported as industrial raw materials. These exceptions are regulated by several provisions, including:

1. Minister of Environment and Forestry Regulation No. 19 of 2021 on Procedures for the Management of Non-B3 Waste, Article 40, paragraph (5), which states that "the import of Non-B3 waste as referred to in paragraph (4) is exempted for Non-B3 waste regulated in accordance with statutory provisions";
2. Minister of Trade Regulation No. 8 of 2024, amending for the third time Minister of Trade Regulation No. 36 of 2023 on Import Policy and Regulation. This exemption is based on the industrial need for raw materials that cannot be fully met by local waste. Some of the Non-B3 waste commodities allowed as industrial raw materials include paper, metal, plastic, textiles and textile products, rubber, and glass (Minister of Trade Regulation No. 8 of 2024, Attachment I, Roman numeral VI, pages 204 to 217).

Importers of Non-B3 waste as industrial raw materials must source from registered exporters in their country of origin.

### **Port of destination in Indonesia and Non-B3 waste as raw material input for industry**

Non-B3 waste can only be processed through specific ports, as follows: Tanjung Priok in Jakarta, Tanjung Emas in Semarang, Tanjung Perak in Surabaya, Soekarno Hatta Port in Makassar, Belawan in Medan, Batu Ampar in Batam, Teluk Lamong in Surabaya, Merak in Cilegon, Weda in Halmahera, Cigading in Cilegon, Bahodopi in Morowali, Bitung in Bitung, Pekanbaru in Pekanbaru, Sekupang in Batam, Panjang in Lampung, Perawang Port in Riau, Kuala Tanjung Port in North Sumatra, and Futong Port in Riau. Non-B3 waste refers to residuals from activities or operations, such as scrap or reja, that do not fall under the



classification of hazardous and toxic waste. Non-B3 waste as industrial raw material, as specified in Minister of Trade Regulation No. 8 of 2024, amending Minister of Trade Regulation No. 36 of 2023 on Import Policy and Regulation, Appendix II, item numbers 586 to 651, cannot be imported or brought in for the following manufacturing purposes:

1. Complementary Goods: Manufactured goods imported by companies with an API-P license to complement their product line, produced by a related company abroad.
2. Market Testing: Manufactured goods imported by API-P licensed companies that are not yet produced domestically, aimed at gauging market reactions and supporting business development over a specific period.
3. After-Sales Service for Goods from Outside the Customs Territory to KPBPB, SEZ, and/or TPB: Goods imported by API-P licensed companies to ensure the availability of spare parts, replacement products, and product substitutions related to their main products.

Non-B3 waste used as industrial raw material, which does not originate from landfill activities, is not classified as waste, and is not mixed with waste, must meet the following criteria:

1. Free from Soil Contamination
2. Clean.

**Partnership strategies that support bonded recycling policies – permit/licensing, input, production, output, fiscal and non-fiscal facilities**

Based on IDIs, the Ministry of Forestry and Environment (MOFE) has proposed several partnership strategies, including: (1) collaboration in developing scoring criteria for waste management facilities as a basis for granting principal permits for establishing KDUB; (2) enhancing oversight of commodities with restricted imports for recycling purposes; (3) ensuring that imported waste is processed in accordance with added value and downstream output requirements; and (4) monitoring the obligation of importers to manage non-B3 waste that cannot be utilized in production processes. The most relevant entities for these partnerships are DGCE and other government agencies (OGA) with vested interests in the output of recycling companies, such as the Ministry of Industry (MOI) and Regional Revenue Agency (BAPPEDA).

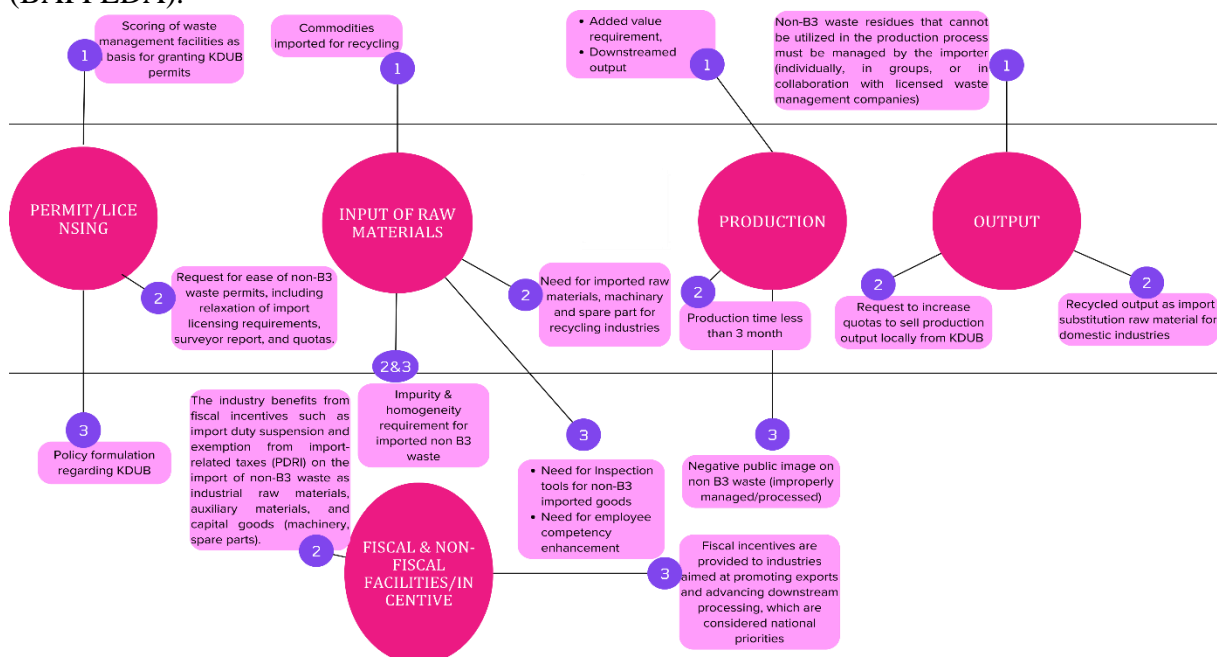


Fig. 4. Proposed partnership strategy for permit/licensing, input, production, output, and fiscal and non-fiscal activities in the bonded recycling industry



Note: 1 – Ministry of Forestry and Environment; 2 – recycling companies; 3 – DGCE (customs and tax authorities)

The partnership between customs and tax authorities, along with other government agencies (OGA), is centered on the policy formulation process regarding KDUB. The Directorate General of Tax (DGT) proposes a comprehensive cost-benefit analysis of fiscal incentives for KDUB before granting permits. This approach aligns with the mandate of the Law on Fiscal Relations between the Central and Regional Governments (UU No. 1/2022), which stipulates that exemptions from PDRJ are reserved only for export activities, downstream processing, and national strategic priorities. Therefore, it is essential to verify the cost-benefit analysis's validity concerning the provision of these incentives, ensuring that the return on activities meets the criteria for exports, downstream processing, and/or strategic priorities through monitoring and evaluation. Additionally, DGCE, as the technical implementer of KDUB regulations, requires partnerships with all relevant OGA stakeholders in the formulation of technical guidelines for KDUB implementation. This collaboration is essential to ensure that the interests of all stakeholders are addressed and aligned towards the common goal of supporting the circular economy for sustainable development. The collaboration involves enhancing the competency of DGCE personnel in inspecting non-B3 imported goods and providing adequate tool support. This capacity building partnership could be conducted by the MOFE.

Lastly, the industry argues that they benefit from fiscal incentives in recycling. To further optimize the performance of the recycling sector, several proposals have been put forward by the industry, including streamlining licensing processes, relaxing or increasing quotas for both the import of non-B3 waste as raw materials and the sale of output to the local market, clarifying regulations regarding the verification of 2 percent impurities rules and homogeneity in non-B3 waste imports, and government support to encourage recycling industry output to serve as a substitute for imported raw materials in other domestic industries.

**Partnership strategies that support bonded recycling policies – monitoring and evaluation**

Among the six scopes of government partnerships in the recycling industry, IDIs reveal that no partnerships currently exist within the scope of monitoring and evaluation. Currently, both general and specific monitoring and evaluation activities are conducted solely by DGCE without collaboration with other governmental agencies. According to IDIs results, agencies such as the Ministry of Industry, the Ministry of Environment, and the Tax Authority have monitoring and evaluation needs that could be strategically conducted in collaboration with the Directorate of Facilities and the Directorate of Enforcement and Investigation (P2) of DGCE. The proposed forms of monitoring and evaluation by these agencies are presented in Fig. 4 below.





Fig. 5. Proposed partnership strategy for monitoring and evaluation/supervision activities in the bonded recycling industry

## CONCLUSION

### Conclusion

The shift towards a circular economy, especially within the context of Bonded Recycling Zones (KDUB), offers substantial potential for advancing sustainable development. Nevertheless, the effective execution of KDUB policies hinges on strong inter-agency partnerships. Presently, there are noticeable gaps in coordination, particularly in the areas of monitoring and evaluation, which are essential for aligning recycling operations with national strategic priorities and environmental regulations. Additionally, while fiscal incentives have positively impacted the recycling sector, their full potential can only be realized through a more efficient licensing process and clearer regulatory guidelines for import verification and waste management.

### Recommendations

1. **Strengthen Inter-Agency Collaboration:** Establish strategic partnerships among customs, tax authorities, the Ministry of Industry, and the Ministry of Environment and Forestry to ensure cohesive policy formulation and effective implementation of KDUB regulations.
2. **Enhance Monitoring and Evaluation:** Develop integrated monitoring and evaluation frameworks that involve relevant agencies, ensuring comprehensive oversight of recycling activities and adherence to environmental and economic objectives.
3. **Optimize Fiscal Incentives:** Conduct thorough cost-benefit analyses before granting fiscal incentives, ensuring they are aligned with export activities, downstream processing, and national strategic goals. Streamline licensing processes and clarify regulations on impurities and waste management to enhance the effectiveness of these incentives.
4. **Capacity Building:** Invest in the competency enhancement of DGCE personnel and provide adequate tool support for the inspection of non-B3 imported goods, ensuring compliance with established standards.
5. **Support Industry Needs:** Address the industry's requests for increased quotas and improved regulations to facilitate the recycling process and promote the use of recycled materials as substitutes for imported raw materials in domestic industries.

### Limitations

This study has several limitations that could affect the generalizability and depth of its findings. Firstly, the research is geographically confined to the Province of Banten, potentially limiting its ability to capture the full range of challenges and opportunities that exist in other regions of Indonesia. Secondly, the study primarily utilizes qualitative data from in-depth interviews, which, despite offering detailed insights, may be influenced by participant bias and may not fully encompass the views of all stakeholders in the circular economy and recycling sectors. Furthermore, the study's focus on Bonded Recycling Zones (KDUB) narrows its scope, leaving broader aspects of the circular economy, such as waste reduction and consumer behavior, less thoroughly examined. Finally, the rapidly changing landscape of environmental policies and market dynamics could diminish the long-term relevance of some findings, underscoring the need for continuous research to remain aligned with these developments.

## REFERENCES

- Brusselaers, J., Breemers, K., Geerken, T., Christis, M., Lahcen, B., & Dams, Y. (2022). Macroeconomic and Environmental Consequences of Circular Economy Measures in a Small Open Economy. *The Annals of Regional Science*, 68: 283-306.
- Cai, C. ., Yu, S. ., Liu, Y., Tao, S., & Liu, W. (2018). PBDE emission from E- wastes during



- the pyrolytic process: Emission factor, compositional profile, size distribution, and gas-particle partitionin. *Environmental Pollution*, 235, 419–428.
- Directorate General of Customs and Excise Directorate of Customs Facilitation. (2020). *Is the Establishment of Bonded Recycling Zones Necessary?*
- Directorate of Chemical and Pharmacy Ministry of Industry. (2023). *National Plastic Waste Recycling Industries Data*.
- Donati, F., Niccolson, S., de Koning, A., Daniels, B., Christis, M., Boonen, K., Geerken, T., Rodrigues, J.F.D. (2020). Modeling the Circular Economy in Environmentally Extended Input-Output. *Journal of Industry Ecology*.
- Ekvall, T., Hirschnitz-Garbers, M., Eboli, F., & Sniegocki, A. (2016). A systemic and systematic approach to the development of a policy mix for material resource efficiency. *Sustainability*, 8(4), 373.
- Friedrich, C. (1967). *An Introduction to Political Theory: Twelve Lectures at Harvard*. Harvard University Press.
- Lacy, P., Long, J., & Spindler, W. (2020). *The CE Handbook: Realizing the Circular Advantage*. Palgrave Macmillan.
- Leal, F. ., Saari, U., Fedoruk, M., Iital, A., Moora, H., Kloga, M., & Voronova, W. (2019). An overview of the problems posed by plastic products and the role of extended producer responsibility in Europe. *Journal of Cleaner Production*, 214, 550–558.
- Li, W. ., Tse, H. ., & Fok, L. (2016). Plastic waste in the marine environment: A review of sources, occurrence and effects. *Science of the Total Environment*, 566–567, 333–349.
- Mala, N. A., Mardiat, R. (2018). Model Perencanaan Energi Hijau Menggunakan Metode CGE. *JNTETI*, Vol. 7, No. 2, Mei 2018.
- Milios, L. (2021). Towards a CE Taxation Framework: Expectations and Challenges of Implementation. *CE and Sustainability*, 1, 477–498. <https://doi.org/https://doi.org/10.1007/s43615-020-00002-z>
- Ministry of National Development Planning/Bappenas. (2023a). *Memperkuat Implementasi Ekonomi Sirkular di Indonesia: Perencanaan Kebijakan dan Program untuk Mendorong Ekonomi Sirkular di Indonesia*. [https://www.undp.org/sites/g/files/zskgke326/files/2023-07/modul\\_6\\_ce.pdf](https://www.undp.org/sites/g/files/zskgke326/files/2023-07/modul_6_ce.pdf)
- Ministry of National Development Planning/Bappenas. (2023b). *Memperkuat Implementasi Ekonomi Sirkular di Indonesia: Perencanaan Kebijakan dan Program untuk Mendorong Ekonomi Sirkular di Indonesia*. [https://www.undp.org/sites/g/files/zskgke326/files/2023-07/modul\\_6\\_ce.pdf](https://www.undp.org/sites/g/files/zskgke326/files/2023-07/modul_6_ce.pdf)
- Mutiarin, D., Suranto, Darumurti, A., Tamronglak, A., & Jovita, H. D. (2018). *Public Policy in Theory and Practice* (1st ed.). Jusuf Kalla School of Government Universitas Muhammadiyah Yogyakarta.
- Ni, K., Lu, Y., Wang, T., Shi, Y., Kannan, K., Xu, L., Li, Q., & Liu, S. (2013). Polybrominated diphenyl ethers (PBDEs) in China: Policies and recommendations for sound management of plastics from electronic wastes. *Journal of Environmental Management*, 115, 114–123.
- OECD. (2021). *Towards a More Resource-Efficient and CE - The Role of the G20*. <https://www.oecd.org/environment/waste/OECD-G20-Towards-a-more-Resource-Efficient-and-Circular-Economy.pdf>
- Regional Chief Economist Forum. (2024). *Regional Economics Performance 2024*.
- Ramos, D., Fonseca, L., Goncalves, J., Carvalho, R., Carvalho, S., Santos, G. (2022). Cost-Benefit Analysis of Implementing Circular Economy in a Portuguese Company: From a Case Study to a Model. *Quality Innovation Prosperity*, 26/1.
- Rukanova, B., Männistö, T., Hintsa, J., Tan, Y., Slegt, M., & Heijmann, F. (2022). A High-Level Framework for Green Customs and Research Agenda. *The 23rd Annual*



- International Conference on Digital Government Research.  
<https://doi.org/https://doi.org/10.1145/3543434.3543660>
- Troschinetz, A. ., & Mihelcic, J. . (2009). Sustainable recycling of municipal solid waste in developing countries. *Waste Management*, 29(2), 915–923.
- United Nations Environment Assembly of the UNEP. (2019). UNEP/EA.4/Res.1.
- United Nations Institute for Training and Research. (2024). *The GLObal E-Waste Monitor 2024*.
- Wahyudi, I. T., Riesfandiari, I., & Syamsuddin, M. A. (2023). A Proposed Framework for Customs' Transition to Circular Economy. *Educoretax*, 3(4), 371–390.  
<https://doi.org/https://doi.org/10.54957/educoretax.v3i4.577>
- Wibowo, E., & Tangkilisan, H. N. S. (2004). *Kebijakan Publik dan Budaya*. Yayasan Pembaruan Administrasi Publik Indonesia.
- Wilts H, & O'Brien, M. (2019). A policy mix for resource efficiency in the EU: key instruments, challenges and research needs. *Ecol Econ*, 155, 59–69.
- Zaman, A. . (2013). Identification of waste management development drivers and potential emerging waste treatment technologies. *International Journal of Environmental Science and Technology*, 10(3), 455–464.