



## Fiscal Incentives for Private Investment in Indonesia's Recycling: Lessons from Japan's Eco-Town

Stefano Richard Desmond\*, Radityo Utomo, Sonny Vavirya Wiranata

Direktorat Jenderal Pajak - Kementerian Keuangan, Jakarta Selatan, Indonesia

[stevanorichard@gmail.com](mailto:stevanorichard@gmail.com), [radityoutomo92@gmail.com](mailto:radityoutomo92@gmail.com), [sonnywiranata@gmail.com](mailto:sonnywiranata@gmail.com)

### Abstract

*Indonesia faces increasing pressure on its waste management system due to population growth, urbanization, rising waste generation, and limited landfill capacity. Waste-to-energy and recycling infrastructure can reduce landfill dependence and support the transition toward a circular economy. However, such projects require substantial upfront investment and face risks related to financing, revenue certainty, regulatory changes, and limited local fiscal capacity, reducing their attractiveness to private investors. This study aims to examine how fiscal incentives can reduce investment barriers and improve the financial viability of waste management projects in Indonesia by drawing lessons from Japan's Eco-Town Programme. A qualitative comparative case study approach is employed, comparing the Sunter Intermediate Treatment Facility (ITF) in Jakarta with Japan's Eco-Town Programme. The study analyzes secondary data from policy documents, government reports, institutional publications, and academic literature, focusing on fiscal incentives, investment risks, financing mechanisms, regulatory certainty, and government-private sector cooperation. The findings indicate that the initial tipping fee mechanism for ITF Sunter provided revenue support but created potential long-term fiscal pressure and was insufficient to address broader investment risks. The subsequent feed-in tariff mechanism under Presidential Regulation No. 109 of 2025 seeks to improve revenue certainty and reduce dependence on local government financing. Lessons from Japan demonstrate that effective investment de-risking requires an integrated ecosystem combining fiscal support, regulatory stability, co-financing, recycling industry development, and risk-sharing. The study recommends an integrated fiscal incentive framework linking waste-to-energy incentives with upstream recycling support and long-term regulatory certainty to strengthen investment viability and fiscal sustainability.*

**Keywords:** Fiscal Incentives, Private Investment, Waste Management, Waste-to-Energy, Recycling Industry, Eco-Town Programme.

### Abstrak

*Indonesia menghadapi tekanan yang semakin besar terhadap sistem pengelolaan sampah akibat pertumbuhan penduduk, urbanisasi, peningkatan timbulan sampah, dan keterbatasan kapasitas tempat pemrosesan akhir. Infrastruktur pengolahan sampah menjadi energi dan daur ulang dapat mengurangi ketergantungan pada tempat pemrosesan akhir serta mendukung transisi menuju ekonomi sirkular. Namun, proyek tersebut membutuhkan investasi awal yang besar dan menghadapi risiko pembiayaan, kepastian pendapatan, perubahan regulasi, serta keterbatasan kapasitas fiskal pemerintah daerah. Penelitian ini bertujuan menganalisis bagaimana insentif fiskal dapat mengurangi hambatan investasi dan meningkatkan kelayakan finansial proyek pengelolaan sampah di Indonesia dengan mengambil pembelajaran dari Eco-Town Programme Jepang. Penelitian menggunakan pendekatan studi kasus komparatif kualitatif dengan membandingkan Intermediate Treatment Facility (ITF) Sunter di Jakarta dan Eco-Town Programme Jepang. Analisis menggunakan data sekunder berupa dokumen kebijakan, laporan pemerintah, publikasi institusi, dan literatur akademik dengan fokus pada insentif fiskal, risiko investasi, mekanisme pembiayaan, kepastian regulasi, serta kerja sama pemerintah dan sektor swasta. Hasil penelitian menunjukkan bahwa mekanisme tipping fee awal pada ITF Sunter memberikan dukungan pendapatan, tetapi berpotensi menimbulkan tekanan fiskal jangka panjang dan belum mampu mengatasi risiko investasi secara menyeluruh. Mekanisme feed-in tariff berdasarkan Peraturan Presiden Nomor 109 Tahun 2025 berupaya meningkatkan kepastian pendapatan dan mengurangi ketergantungan pada pembiayaan pemerintah daerah. Pembelajaran dari Jepang menunjukkan bahwa de-risking investasi memerlukan ekosistem terpadu yang menggabungkan dukungan fiskal, stabilitas regulasi, pembiayaan bersama, pengembangan industri daur ulang, dan pembagian risiko. Penelitian ini merekomendasikan kerangka insentif fiskal terpadu yang menghubungkan insentif waste-to-energy dengan dukungan daur ulang dan kepastian regulasi jangka panjang.*

**Kata kunci:** Insentif Fiskal, Investasi Swasta, Pengelolaan Sampah, Waste-to-Energy, Industri Daur Ulang, Eco-Town Programme

## 1. Introduction

Population growth, urbanization, and changes in public consumption patterns have caused pressure on the urban waste management system in Indonesia (Marlina, 2025). Data from the National Waste Management Information System (SIPSN) shows that national waste generation in 2023 will reach around 56.63 million tons per year, with the amount of waste that has been managed properly only reaching 39.01% or around 22.09 million tons, while most of it still faces problems in terms of processing and final disposal (SIPSN, 2025). This condition shows that there is a gap between the increase in the volume of waste and the capacity of the available management infrastructure.

The waste management system in Indonesia still relies heavily on the landfill method as the main solution in handling waste residues. Dependence on Final Processing Sites (TPA) presents various challenges because land capacity is increasingly limited, while the volume of waste continues to increase (Pambudi, 2025). Jakarta is one example of a city that faces great pressure due to limited space for the development of new waste disposal facilities. The existence of the Bantargebang Landfill as a final waste processing center in Jakarta faces the problem of capacity and operational sustainability in the long term. This phenomenon shows the need for a waste management system that is able to reduce the volume of waste before reaching the final stage through more modern processing technology (Tamba & Sujastika, 2024).

The development of technology-based waste treatment facilities such as waste-to-energy and recycling facilities is one of the approaches that has begun to be developed to answer these challenges. Waste-to-energy technology offers the ability to reduce the volume of waste while generating energy through certain processing processes. Meanwhile, recycling facilities play a role in increasing the reuse of waste materials as part of the circular economy concept. The development of such infrastructure requires large investment support because it involves construction, technology, operational, and maintenance costs in the long term (Wirjawan & Choandi, 2024).

The large investment needs have caused the involvement of the private sector to become an important part of the development of the waste management industry in Indonesia. Local governments have limitations in providing all financing needs through the public budget because they have to divide fiscal resources for various public service sectors. The role of private investors is needed to provide capital, technology, and operational capabilities in the construction of waste treatment facilities. However, private sector investment decisions are greatly influenced by the level of economic certainty of projects, revenue mechanisms, and government policy support. Uncertainty regarding financing structures and profit levels can increase investment risks thereby reducing the attractiveness of waste management projects (Ikhlesi & Firdaus, 2025).

The limited fiscal capacity of local governments is one of the factors that affect the ability to develop waste management infrastructure. Local governments have a great responsibility in providing waste services, but available financing sources are often not able to cover all the investment needs and operational costs of technology-based facilities (Ridwan et al., 2026). Financing models that rely solely on local budgets can create pressure on fiscal sustainability because waste treatment projects require long-term funding support. Therefore, governments need to develop policy designs that are able to share risks between the government and the private sector through appropriate fiscal instruments.

The design of fiscal incentives is an important factor in creating more viable investment conditions for Indonesia's waste management industry. Instruments such as investment subsidies, feed-in tariffs, government financing support, and government-private cooperation mechanisms can be used to reduce barriers to initial investment (Sudarya, 2026). The experiences of various countries show that the success of the development of the recycling and waste-to-energy industries is closely related to the government's ability to build incentive schemes that provide certainty for investors. Japan through the Eco-Town Programme is one example of how government fiscal support is able to encourage private investment in the development of recycling industrial estates (Putri et al., 2025). The lessons from this model are relevant to be analyzed in Indonesia to design fiscal incentive policies that can increase the financial viability of waste management projects while supporting the transition to a circular economy system.

The Sunter Intermediate Treatment Facility (ITF) project is one of the challenges of developing technology-based waste treatment facilities in Indonesia. The Government of Indonesia issued Presidential Regulation Number 35 of 2018 concerning the Acceleration of the Development of Waste Processing Plants into Electrical Energy Based on Environmentally Friendly Technology as an effort to encourage the construction of waste-to-energy facilities in urban areas. Jakarta is one of the priority areas because it faces an increase in waste generation and limited final management capacity at the Bantargebang Landfill. Through the ITF Sunter project, the government seeks to reduce dependence on landfills and increase the use of waste as an energy source (Wibisono, 2021).

In the early stages, the ITF Sunter project uses a tipping fee mechanism as a form of local government fiscal support to business entities managing facilities. The scheme is designed to provide income certainty for investors, but poses challenges to the region's fiscal ability because it requires long-term operational financing. The large initial investment needs, technology costs, and uncertainty of return on capital are factors that affect the economic viability of the project. These problems cause the project to experience obstacles until termination in 2023. This condition shows that the design of fiscal incentives has an important role in reducing investment risks and creating certainty for the involvement of the private sector in the waste management industry.

The government then introduced a new mechanism through Presidential Regulation Number 109 of 2025 with a feed-in tariff approach through the purchase of electricity generated from waste treatment facilities (Samhati et al., 2023). The change in the mechanism shows the government's efforts to build a more attractive funding scheme for investors by reducing dependence on direct financing from local governments. ITF Sunter's policy change provides a lesson that the success of waste-to-energy projects requires the design of fiscal incentives that can reduce barriers to initial investment, increase financial feasibility, and provide regulatory certainty. Japan's experience through the Eco-Town Programme is an important reference for understanding how the government's fiscal support and collaboration with the industrial sector can create a more sustainable waste management investment ecosystem.

Although previous studies have examined waste-to-energy financing, fiscal incentives, and Japan's Eco-Town Programme, limited research has specifically analyzed how fiscal incentive design can de-risk private investment in Indonesia's waste recycling and waste-to-energy sector through comparative lessons from Japan. Existing studies tend to focus separately on waste management policy, project financing, or recycling development, leaving a gap in understanding how these policy instruments can be integrated into a comprehensive investment de-risking framework. This study addresses this gap by comparing the policy experience of ITF Sunter in Jakarta with Japan's Eco-Town Programme and examining the role of fiscal incentives, revenue mechanisms, regulatory certainty, co-financing, and government-private sector cooperation in reducing investment risks. The novelty of this study lies in developing an integrated fiscal incentive perspective that connects downstream waste-to-energy investment with upstream recycling industry development, rather than treating them as separate policy areas. Accordingly, this study aims to analyze how fiscal incentives can reduce initial investment barriers, improve project financial viability, and strengthen investor confidence in Indonesia's waste management sector. Specifically, the study seeks to identify policy lessons from Japan's Eco-Town Programme that can inform the design of a more integrated and fiscally sustainable incentive framework for Indonesia.

## 2. Methodology

This study uses a qualitative approach with a comparative case study method to analyze the design of fiscal incentives in reducing investment barriers in the waste management industry. This study compares the case of Indonesia through the ITF Sunter project with Japan through the Eco-Town Programme as a policy learning model. The analysis was carried out by looking at the relationship between fiscal instruments, financing mechanisms, private sector involvement, and their impact on the financial viability of waste management projects.

Japan was chosen as a comparator country because it has experience in developing a technology-based waste management industry through the Eco-Town Programme. The selection of cases was based on the similarities faced by Indonesia, such as limited landfills, the need for private investment in the construction of waste treatment facilities, and the need for government support to create the economic viability of the project. The comparison was conducted to understand how Japan's fiscal incentive design is able to reduce investment risks and support the development of the recycling industry.

This study employs a qualitative comparative case study approach using secondary data from policy documents, government reports, institutional publications, international journal articles, research reports, and other academic literature. The study compares the development of the Sunter Intermediate Treatment Facility (ITF) in Jakarta with Japan's Eco-Town Programme. Indonesian data sources include Presidential Regulation Number 35 of 2018, Presidential Regulation Number 109 of 2025, and official documents concerning the planning, financing, and development of ITF Sunter. Japanese data were obtained from policy documents and reports published by the Ministry of Economy, Trade and Industry (METI), the Ministry of the Environment of Japan, and other relevant institutions concerning the Eco-Town Programme.

Documents and literature were selected based on four criteria: (1) direct relevance to fiscal incentives, waste-to-energy, recycling, investment financing, or waste management policy; (2) publication by an official government institution, recognized research institution, or peer-reviewed academic journal; (3) sufficient information on policy mechanisms, financing arrangements, or institutional implementation; and (4) relevance to the Indonesian or Japanese case. The analysis covers policy and institutional developments from the introduction of Indonesia's waste-to-energy policy in 2018 through the implementation of Presidential Regulation Number 109 of 2025, while Japanese sources focus on the development and implementation of the Eco-Town Programme and its subsequent policy experience.

Data were analyzed using thematic coding and comparative analysis. The coding process categorized the evidence into five analytical dimensions: fiscal incentives, revenue and financing mechanisms, investment risks, regulatory certainty, and government-private sector cooperation. The two cases were then compared systematically to identify similarities, differences, policy strengths, and limitations in reducing private investment risks. Data validity was strengthened through source triangulation by comparing information across government regulations, official institutional reports, academic literature, and research reports. Findings were retained when key information could be corroborated across multiple independent sources, while discrepancies were examined by referring to the most authoritative and recent primary policy documents. This procedure enhances the consistency, transparency, and replicability of the comparative analysis.

This study focuses on the analysis of the design of fiscal incentives and their influence on the investment risk and financial feasibility of waste management projects. The study does not discuss the technical aspects of the operation of the facility in depth, such as machine technology, energy production capacity, or technical calculation of emissions. The analysis is limited to a comparison of Indonesia's policies through ITF Sunter and Japan through the Eco-Town Programme based on the available secondary data.

### **3. Results and Discussion**

#### **3.1 Comparative Results: ITF Sunter and Japan's Eco-Town Programme**

The Sunter Intermediate Treatment Facility (ITF) was developed by the DKI Jakarta Provincial Government to reduce the burden of urban waste management and dependence on Bantargebang Landfill. Its development was supported by Presidential Regulation No. 35 of 2018, which established a framework for waste-to-energy facilities through cooperation between local governments and business entities (BPK RI, 2023). Initially, ITF Sunter relied on a tipping fee mechanism financed through the DKI Jakarta Regional Budget. Although the scheme provided revenue certainty for operators, its estimated cost of approximately IDR 2 trillion per year created concerns regarding long-term fiscal sustainability and contributed to the project's eventual cancellation in 2023 (BPK RI, 2023).

A new approach was introduced through Presidential Regulation No. 109 of 2025, which shifted project support toward electricity purchases from waste treatment facilities by PLN at a rate of 20 US cents per kWh and reduced reliance on local government tipping fees. The regulation also allows the involvement of Danantara as an investment institution to support financially viable projects (Stockbit Snips, 2025). This policy shift represents an attempt to improve revenue certainty and reduce investment barriers for waste-to-energy projects.

In contrast, Japan's Eco-Town Programme, established in 1997 by the Ministry of International Trade and Industry (MITI), now METI, with support from the Ministry of the Environment (MoE), adopts a broader regional approach. The programme integrates waste management, recycling, industrial activities, and resource recovery to support a circular economy (Kitagawa, 2024). Its institutional structure combines central government

policy and funding support, local government coordination, and private sector investment. This approach creates a more stable investment environment and helps reduce risks associated with environmental infrastructure projects (Ohta & Barrett, 2023).

Kitakyushu Eco-Town demonstrates the application of this model through cooperation among the Kitakyushu City government, central government, and private companies, resulting in a recycling industry hub based on industrial symbiosis (Herrador et al., 2023). Similarly, Kawasaki Eco-Town integrates industrial activities with waste treatment and material recovery. These examples demonstrate that Japan's approach combines government policy, industrial investment, and institutional coordination to create an integrated waste management system (United Nations Centre for Regional Development, 2020).

Tabel 1. Comparison of fiscal incentive structures

| Dimensions                          | Indonesia: ITF Sunter                                                                                                 | Japan: Eco-Town Programme                                                                       |
|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| <b>Policy objectives</b>            | Reducing the burden of urban waste through waste-to-energy technology                                                 | Developing a circular economy system through the recycling industry                             |
| <b>Incentive targets</b>            | Investors/operators of waste treatment facilities                                                                     | Recycling industry and waste management companies                                               |
| <b>Forms of incentives</b>          | Tipping fees based on waste treatment services and changes to feed-in tariffs                                         | Government support for facility development, regional development, and environmental technology |
| <b>Support resources</b>            | The DKI Jakarta Regional Budget in the initial scheme, then the purchase of electricity by PLN through the new scheme | Central government, local government, and industrial sector investment                          |
| <b>Intervention points</b>          | Downstream, which is the final waste processing stage                                                                 | Downstream and middle, i.e. material recovery, recycling, and industrial integration            |
| <b>Investment model</b>             | A single project based on large facilities                                                                            | Industrial estate with several actors and facilities                                            |
| <b>Investor risk</b>                | High due to changes in financing mechanisms and income certainty                                                      | Lower due to long-term policy support and institutional coordination                            |
| <b>Government-private relations</b> | The government provides support to make the project economically viable                                               | The government creates an ecosystem for the industry to develop                                 |

The comparison indicates that Indonesia and Japan employ fundamentally different approaches to waste management investment. ITF Sunter follows a project-based model focused on downstream waste treatment, while Japan's Eco-Town Programme adopts a regional and ecosystem-based model integrating recycling, industrial activities, and waste management. From a private investment perspective, Japan demonstrates that fiscal incentives can function not only as financial support but also as instruments for building a stable investment ecosystem.

### 3.2 Fiscal Incentives and Investment Risk

The ITF Sunter case demonstrates the importance of fiscal incentive design in determining the financial feasibility of waste management infrastructure. The initial tipping fee provided income certainty to operators but placed a significant long-term burden on the regional budget. The subsequent shift to a feed-in tariff under Presidential Regulation No. 109 of 2025 changes the revenue mechanism from payment for waste treatment services to income from electricity sales. While this may reduce direct pressure on the regional budget, the financial sustainability of the project still depends on tariff adequacy, electricity purchase arrangements, investment costs, and long-term contractual certainty.

Japan applies a different model by providing government support during the development stage while allowing private companies to participate in investment and operations. This distribution of financing responsibilities reduces the concentration of risk on either the government or private sector. The Japanese experience suggests that fiscal sustainability can be strengthened by combining initial public support with private investment and revenue generation from recycling and resource recovery activities.

Regulatory stability is another important determinant of investor confidence. The changes in the ITF Sunter financing mechanism demonstrate how changes in policy can affect investment calculations, revenue projections, and expected returns. The withdrawal of Fortum from the ITF Sunter project further illustrates the importance of regulatory certainty for projects characterized by high initial investment and long payback periods. In contrast, the Eco-Town Programme benefits from long-term institutional coordination among METI, MoE,

local governments, and industry, providing greater certainty for companies making environmental technology investments.

### 3.3 Intervention Points and Policy Effectiveness

The main intervention in ITF Sunter occurs at the downstream stage, where residual waste is processed after collection. This approach is necessary to reduce the volume of waste entering Bantargebang Landfill (Wibisono, 2021). However, a predominantly downstream strategy requires large treatment capacity and substantial investment because incineration facilities involve complex technology and high construction and operational costs.

Japan's Eco-Town Programme provides a broader intervention model by integrating waste reduction, material recovery, recycling, and industrial activities. Kitakyushu Eco-Town, for example, connects various recycling facilities with industrial activities, allowing materials to return to the production cycle (Conch et al., 2025). This reduces the volume of residual waste requiring final treatment while simultaneously creating economic value from waste.

The comparison therefore suggests that waste-to-energy development in Jakarta should not be implemented as a standalone downstream solution. It should be complemented by upstream incentives for waste separation, material recovery, recycling facilities, and circular-economy industries. Such integration can reduce the required capacity of final treatment facilities and improve the long-term efficiency of infrastructure investment.

### 3.4 Co-Financing and Replication through Danantara

Japan's Eco-Town Programme demonstrates a clear division of roles among the central government, local governments, and private companies. The central government provides policy and initial financial support, local governments coordinate regional implementation, and private companies invest in and operate facilities. This co-financing structure distributes investment risks and strengthens project viability.

This model has potential relevance for Indonesia through investment institutions such as Danantara. Danantara could support the initial financing requirements of waste management projects and increase investor confidence. However, financial participation alone would not be sufficient. It should be accompanied by regulatory certainty, local government readiness, integrated regional planning, and development of recycling industries. A collaborative model involving the central government, local governments, Danantara, and private investors could therefore provide a stronger financing structure than reliance on local government budgets alone.

### 3.5 Environmental Considerations and Policy Implications

The development of waste-to-energy facilities also requires consideration of environmental risks. Incineration can reduce waste volumes but may generate air emissions and residual materials requiring appropriate management. Concerns raised by organizations such as WALHI and ICEL highlight the importance of emission controls and proper management of incineration residues.

Japan's experience indicates that fiscal and investment policies need to be accompanied by environmental standards, monitoring systems, and integrated residue management. For Jakarta, strengthening environmental regulation alongside financial incentives can improve public acceptance and ensure that waste-to-energy development achieves both economic and environmental objectives.

Overall, the comparison shows that Indonesia's transition from tipping fees to feed-in tariffs represents progress toward improving the financial attractiveness of waste-to-energy projects. However, the Japanese Eco-Town experience indicates that fiscal incentives are most effective when combined with regulatory stability, co-financing, upstream recycling incentives, industrial integration, and strong environmental governance. For Jakarta, the key policy lesson is therefore to move from a single-project, downstream financing model toward an integrated waste management investment ecosystem that distributes risks among government, investment institutions, and private industry.

#### 4. Conclusions

This study concludes that fiscal incentive design plays an important role in reducing initial investment barriers and improving the financial viability of waste management projects in Indonesia. The case of ITF Sunter demonstrates that the shift from a tipping fee mechanism to a feed-in tariff under Presidential Regulation Number 109 of 2025 represents an effort to provide greater revenue certainty and reduce dependence on direct local government financing. However, the effectiveness and long-term sustainability of this mechanism depend on stable regulatory support, appropriate risk allocation, and the development of a stronger recycling industry. The experience of Japan's Eco-Town Programme further demonstrates that successful waste management investment requires more than the development of treatment facilities; it depends on an integrated ecosystem combining fiscal incentives, regulatory certainty, financing support, recycling industry development, and sustained cooperation between central government, local governments, and private industry. Based on these findings, the Indonesian government should develop an integrated fiscal incentive framework that connects support for waste-to-energy facilities with the development of the recycling industry. The implementation of Presidential Regulation Number 109 of 2025 should be supported by financing and risk-sharing mechanisms that provide sufficient certainty for investors while maintaining fiscal sustainability. The government can also adopt relevant elements of Japan's center-local government-industry cooperation model in developing waste management projects in Jakarta and other regions. Such an integrated approach can strengthen project financial viability, reduce investment risks, and support the development of a circular economy. Future research should evaluate the implementation of feed-in tariff mechanisms after projects become operational, particularly their effects on fiscal sustainability, investment performance, and waste reduction. Further studies could also examine public acceptance of waste-to-energy facilities and assess the feasibility of adapting the Eco-Town model to the development of recycling-based industrial areas in Indonesia

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