



ENHANCING PRIVATE SECTOR INVOLVEMENT

in the Waste Management
in Municipalities and
Tourism Sector

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List of Acronyms:

3R	Reduce, Reuse, Recycle
A*STAR	Agency for Science, Technology, and Research (in context: Singapore's Agency)
ACGF	ASEAN Catalytic Green Finance Facility
ADB	Asian Development Bank
AMS	ASEAN Member States
AMUSE	ASEAN Municipal Solid Waste Management Enhancement
ASEAN	Association of Southeast Asian Nations
BMA	Bangkok Metropolitan Authority
BMZ	German Federal Ministry for Economic Cooperation and Development
BOT	Build-Operate-Transfer
B2B	Business-to-Business
CBO	Community-Based Organizations
CDM	Clean Development Mechanism (in context: Kyoto Protocol to generate carbon credits)
COBSE	Coordinating Body on the Seas of East Asia
CSR	Corporate Social Responsibility
CWP	The Community Waste Project
DBOO	Design-Build-Own-Operate
DBOOT	Design-Build-Operate-Own-Transfer
DBOT	Design-Build-Operate-Transfer
DENR	Department of Environment and Natural Resources (in context: Philippines' Agency)
DEQP	Department of Environmental Quality Promotion (in context: Thailand's Agency)
ERIA	Economic Research Institute for ASEAN and East Asia
EPR	Extended Producer Responsibility

ESG	Environmental, Social, and Governance
GIS	Geographic Information System
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
IoT	Internet of Things
IWMF	Integrated Waste Management Facilities
KLHK	Ministry of Environment and Forestry (in context: Indonesia's Ministry)
KPI	Key Performance Indicator
LGU	Local Government Units (in context: Philippines)
MBI	Market-based Instruments
MRF	Material Recovery Facility
MSWM	Municipal Solid Waste Management
NEA	National Environment Agency of (in context: Singapore's Agency)
NGO	Non-Governmental Organization
O&M	Operation and Maintenance
PAYT	Pay-As-You-Throw
PCX	Plastic Credit Exchange
PPA	Power Purchase Agreements
PPP	Public-Private Partnerships
PRO	Producer Responsibility Organizations
PUB	Public Utilities Board (in context: Singapore's Agency)
RDF	Refuse-Derived Fuel
RFI	Request for Information
RFID	Radio Frequency Identification

List of Acronyms:

ROI	Return on Investment	TPS3R	Waste Facility with Reduce, Reuse, Recycle (in context: Indonesia's programs)
RVM	Reverse Vending Machine	UCLA	USWAG Calahunan Livelihood Association Inc.
SDG	Sustainable Development Goals	UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
SWM	Solid Waste Management	UNESCO	United Nations Educational, Scientific, and Cultural Organization
TIPMSE	The Thailand Institute of Packaging and Recycling Management for Sustainable Environment	USEPA	US Environmental Protection Agency
ToR	Terms of Reference	WtE	Waste to Energy





01

INTRODUCTION

1.1.

Waste Management in ASEAN Countries

The Association of Southeast Asian Nations (ASEAN), comprising ten ASEAN Member States (AMS), is undergoing rapid urbanization and economic growth. While this development has driven regional growth and improved living standards, it has also led to a sharp increase in solid waste generation, placing significant strain on waste management systems. As of 2023, ASEAN countries collectively generate an estimated 150 million tons of municipal solid waste annually¹ - a figure projected to rise further due to sustained population growth, continuous urbanization, and changes in consumption patterns.

Urban centers such as Bangkok, Jakarta, and Manila exemplify the scale of the challenge, each producing over 10,000 tons of waste per day. The waste composition in these cities is predominantly organic - comprising approximately 50–60% of total waste. However, the increasing share of plastic waste, which accounts for around 20%, is a growing environmental concern. Plastics pose particular challenges due to their extensive use, durability, limited recyclability, and high potential to leak into the environment^{2,3,4}.

ASEAN cities like Bangkok, Jakarta, and Manila each generate 10,000+ tons of waste daily, with organic waste making up 50–60% and plastic waste nearly 20%.



Source: <https://rri.co.id> (RRI, 2024)

Tourism - one of the major economic pillars in ASEAN - further exacerbates the waste situation. These areas experience seasonal spikes in waste generation, driven by millions of domestic and international visitors. The inability of local infrastructure to cope with surges in waste poses risks to environmental quality, public health, and the long-term viability of tourism. Effective waste management in tourism hotspots is therefore essential to preserving natural assets and sustaining economic benefits.

Waste management practices across ASEAN are diverse, reflecting differing levels of institutional capacity, infrastructure development, regulatory frameworks, and private sector participation. Countries such as Singapore, Malaysia, and Thailand have developed more formalized systems, often featuring structured public-private partnerships (PPPs) that enhance service delivery, infrastructure, and technological innovation. Conversely, Cambodia, Myanmar, and the Lao People's Democratic Republic still depend largely on open dumping, with fragmented systems, weak regulatory oversight, and low private sector involvement.

1. UNDP, 2017. Summary Report: Waste Management in ASEAN Countries

2. Climate Change Commission. (2024). Combating Plastic Pollution to Secure Our Planet's Future. CCC: <https://climate.gov.ph/news/870#:~:text=In%20the%20Philippines%2C%20approximately%202.7,food%20chains%20and%20weakening%20ecosystems>

3. Saraswati, Aviaska Wienda. (2022). Waste Problem in Jakarta Will be Solved. Greeneration Foundation: <https://greeneration.org/en/publication/green-info/waste-problem-in-jakarta-will-be-solved/#:~:text=going%20so%20far%20Jakarta's%20Waste%20Problem,the%20percentage%20is%20still%20low>

4. Liu, Chen, et al. (2020). Food Waste in Bangkok: Current Situation, Trends, and Key Challenges. Resources Conservation and Recycling 157(1A):104779

Against this backdrop, private sector involvement is increasingly seen as a critical lever for improving waste management systems. Whether through large corporations, small and medium-sized enterprises (SMEs), or community-based service providers, engagement of private actors offer following benefits:



Private actors can mobilize investment and deploy advanced technologies that municipalities often cannot access alone.



They tend to deliver services more efficiently, especially under performance-based or results-oriented contracts.



Their involvement can help expand services to underserved areas, including tourism hotspots and informal settlements.



Governments can concentrate on their core functions of regulation, policy-making, and oversight, while private companies manage operations.



Private enterprises are often well-positioned to adopt circular economy business models that minimize waste and create long-term economic value.

Considering those aspects, private sector involvement is increasingly indispensable. Achieving sustainable waste management and advancing circular economy principles in ASEAN will require a coordinated approach that leverages the strengths of both public and private actors.

Despite these acknowledged advantages, private sector participation in waste management remains limited or underutilized in many ASEAN countries. A key constraint is the lack of an enabling environment, e.g. legislation often fails to clearly define roles and responsibilities, ensure transparency and accountability, or provide the legal certainty and risk mitigation mechanisms required to attract private investment. Addressing these gaps will be essential to unlocking the potential of the private sector in delivering more effective, inclusive, and sustainable waste management systems.

1.2.

Purpose and Scope of this Review

This review paper aims to provide actionable guidance on enhancing private sector involvement in waste management across municipalities and tourism-focused areas in the ASEAN region. In recognition of the critical role that businesses - large and small - can play in addressing growing waste challenges, the paper seeks to identify effective strategies to unlock their full potential as partners in sustainable development.



This paper serves four key objectives:

01

Enhancing the understanding of public-private partnerships in waste management, with a focus on roles, responsibilities, and the value added by different stakeholders.

02

Promote best practices and lessons learned from ASEAN Member States to inspire replication and adaptation of successful models.

03

Facilitate collaboration between governments, the private sector, and civil society by showcasing effective partnership approaches and multi-stakeholder engagement.

04

Support the development of enabling environments, including regulatory frameworks, financial instruments, and institutional mechanisms that attract and sustain private sector participation.

This review is intended for government officials, private waste operators, tourism stakeholders, development partners, researchers, and civil society. It offers both practical insights and strategic recommendations to inform planning, investment, and implementation of improved waste management systems that leverage the strengths of the private sector.

This review employs the terminology *private sector involvement* rather than *engagement* to better reflect the ways in which private actors / businesses contribute to waste management in ASEAN. While they are often used interchangeably, private sector engagement generally refers to the efforts initiated by governments or development partners to attract and encourage private actor participation. This is often achieved through partnerships and blended financing arrangements in development initiatives⁵, suggesting a more top-down approach typically involving formal collaboration mechanisms.

In contrast, private sector involvement is in most cases more inclusive because it covers not only formal partnerships, but also the wider spectrum of ways in which private actors participate in or influence waste management systems, whether it be service delivery, infrastructure development, recycling and recovery activities, or informal sector participation. The Asian Development Bank (ADB) uses similar language in its Handbook on Public-Private Partnership⁶, or the World Bank in its report on public policy for the private sector⁷, underscoring that the use of involvement covers both formal and informal forms of private participation/partnership structures, especially in Southeast Asia where informal models are prevalent, ranging from investments to service delivery.

As such, this framing is more appropriate for this review, which covers a diverse set of actors and models of collaboration with private actors, from formal public-private partnerships to informal and locally integrated solutions.

The term private sector in this review refers to all market-oriented, for-profit actors involved in waste management activities, whether through formal partnerships or independent efforts. This includes large-scale businesses managing infrastructure and public service contracts, small and medium-sized enterprises (SMEs) offering collection or recycling services, startups developing waste technologies, and community-based enterprises engaged in waste management systems. This broad definition reflects the diverse landscape of private sector contributions across the ASEAN region.

While this review focuses on private sector involvement in waste management systems, it recognises Extended Producer Responsibility (EPR) as one of several policy instruments that can shape how private actors participate. EPR concerns the responsibility of producers for the end-of-life management of products they place on the market and does not replace the government's overall responsibility to ensure waste management as a public service. In this review, EPR is therefore treated as a complementary mechanism that can support private sector involvement in specific waste streams, rather than as a substitute for the public waste management systems or municipal service provision.

5. OECD (2016). Private Sector Engagement for Sustainable Development: Lessons from the DAC. Paris: OECD Publishing

6. ADB (2008). Public-Private Partnership Handbook. Manila: ADB Headquarters

7. World Bank (2010). Private Infrastructure. Washington: World Bank

The scope of the paper is defined by the following dimensions:



Geographical Focus

The review covers the ASEAN Region and acknowledges the diversity in economic development, institutional capacity, and waste management systems across the region. It identifies cross-cutting themes and adaptable practices that are relevant and applicable across varying national and local contexts.



Sectoral Focus

The review focuses on Municipal Solid Waste Management and explores how private sector participation can enhance service delivery, infrastructure development, and efficiency in urban waste systems.



Key Themes and Topics

The review is structured in seven core topics central to enabling private sector involvement in solid waste management across ASEAN:



Current Landscape and Entry Points:

A review of the ways in which private actors are currently involved in municipal and tourism waste systems across ASEAN, identifying entry points along the waste value chain and the types of partnerships emerging at different stages of service delivery.

Regulatory Frameworks:

An analysis of existing policies and legal instruments that shape the environment for private sector involvement, including public-private partnerships and instruments such as Extended Producer Responsibility (EPR) and circular economy mandates.

Business Models:

A typology and assessment of successful business models such as PPPs, concessions, and blended finance mechanisms, highlighting what works and why.

Technological Innovations:

A review of relevant technologies—from digital tracking systems to waste-to-energy solutions—that offer new value propositions for businesses and governments alike.

Case Studies:

Documentation of real-world examples from ASEAN Member States, showcasing private sector initiatives and collaborations that have yielded measurable environmental and economic benefits.

Challenges and Solutions:

Identification of recurring barriers—such as weak enforcement, investment risks, and limited technical capacity—and corresponding policy and operational responses that can foster a more enabling environment.

Implementation Strategies:

Practical guidance for governments and stakeholders on how to prepare, pitch, structure, and sustain partnerships with the private sector.

CURRENT LANDSCAPE & ENTRY POINTS FOR PRIVATE SECTOR INVOLVEMENT

02



This chapter provides an overview of the current landscape of private sector involvement in ASEAN waste management sector, both municipal and tourism and illustrates how private actors are already contributing across different stages of the waste value chain and what forms of participation exist today.

2.1.

Interlinkages between Waste, Circular Economy, Tourism, and Private Sector

Waste Management refers to the full range of activities and systems involved in the collection, transportation, treatment, and final disposal of waste. It includes both formal and informal systems and encompasses a wide variety of waste streams from municipal solid waste (MSW), e.g. household and commercial waste, both significantly composed of organic and plastic waste. Across ASEAN, waste management systems are at various stages of development, with more advanced systems typically found in countries such as Singapore, Malaysia, and Thailand, while others still rely on rudimentary collection and open dumping. The pressing need for more efficient, inclusive, and sustainable waste management models has created spaces for new actors and need for sustainable business models. In this context, governments typically play a central role in not only ensuring the operationalisation of waste management, but also establishing regulatory frameworks, setting environmental standards, and coordinating waste management infrastructure and services. Public authorities are also responsible for enabling financing mechanisms, enforcing compliance, and facilitating partnerships with the private sector and communities to improve system-wide performance.

The Circular Economy (CE) offers a strategic framework for transforming waste from a liability into a resource. In contrast to the traditional linear “take-make-dispose” model, the CE promotes principles of resource efficiency, product longevity, reuse, repair, recycling, and recovery. It aims to close material loops and reduce environmental impact while generating economic opportunities. CE is highly relevant to ASEAN sustainability agenda, especially given rising resource consumption and waste generation in rapidly urbanizing areas. Transitioning to circular models requires a robust waste management infrastructure, but also depends on the private sector to design, finance, and operate circular business models.

Sustainable Tourism aims to minimize negative environmental, social, and cultural impacts. The ASEAN region is home to world-renowned coastal, cultural, and natural destinations that attract millions of tourists annually. However, the influx of visitors often places immense strain on local infrastructure, especially in terms of solid waste generation and disposal. Poor waste management not only harms local ecosystems and public health but also diminishes the attractiveness of destinations. As tourism continues to grow, it becomes increasingly important to align waste management efforts with sustainability goals.

As tourism continues to grow, it becomes increasingly important to align waste management efforts with sustainability goals to preserve local ecosystems, maintain public health, and enhance the attractiveness of destinations.

The private sector plays key role in these three domains. Businesses - ranging from large multinational firms and tourism conglomerates to SMEs, start-ups, and community-based enterprises - can bring essential resources and expertise. Their involvement can enhance efficiency, mobilize capital, introduce technological innovations, and expand service coverage in underserved areas. Moreover, private actors often serve as both waste generators and solution providers, positioning them uniquely to implement circular practices and support sustainable development. Consequently, private sector involvement in waste management has been increasingly demanded, considering the challenges faced by the public sector in the waste management operation, among others to unlock the financial resources, integrating the informal sector players, and adopting technologies⁸.

Beyond public-private arrangements, Business-to-Business (B2B) relationships are emerging as a critical mechanism for advancing circular economy practices in ASEAN waste management systems. These models link private waste service providers directly with commercial waste generators, particularly in tourism, retail, and industrial sectors.

Strengthening B2B models can significantly improve system efficiency by aligning economic incentives with waste reduction and resource recovery outcomes. When businesses procure waste services based on performance indicators such as recycling rates, contamination reduction, or verified emissions savings. Private providers are incentivized to invest in better technology, workforce skills, and service innovation. This creates a virtuous cycle that supports both municipal waste objectives and private sector competitiveness.

The following section outlines concrete entry points where private actors can contribute along the solid waste value chain.

2.2.

Entry points for private sector in Municipal Waste Management

The waste value chain comprises multiple stages, each of which offers opportunities for private sector involvement:



Collection & Transport

Private sector involvement in waste collection and transportation services can lead to improved efficiency and service quality. Private companies can introduce advanced logistics and fleet management systems to optimize waste collection routes and reduce operational costs. It is often formalized through service contracts or management contracts with local governments. These contracts define the routes, performance targets, and fee structures, e.g. based on per-ton collected, per household serviced, or fixed annual payments. In some cities, contractors are allowed to collect service fees directly from households (e.g. under regulated tariffs), while others are reimbursed from municipal budgets. In more advanced models, services are bundled into concessions, granting the private operator exclusive rights within a service area for a defined period. Such contracts may also include incentives for service coverage expansion, route optimization (e.g. GPS-based logistics), and fuel efficiency.

8. World Bank. (2021). *Bridging the Gap in Solid Waste Management: Governance Requirements for Results*. Washington, DC: World Bank Group.



Sorting & Processing

SMEs and cooperatives play a key role in recovering recyclable materials or in operating composting sites, while larger firms invest in material recovery facilities, Waste-to-Energy (WtE) plants, and engineered landfills, frequently through PPPs or concession models. Private participation in WtE projects can attract significant investment and expertise. WtE projects typically involve Build-Operate-Transfer (BOT) or Design-Build-Own-Operate (DBOO) contracts, where the private sector finances, builds, and operates the facility over 15–30 years. Governments may offer tipping fees per ton of waste processed, combined with power purchase agreements (PPAs) for the sale of electricity. Some contracts also include minimum feedstock guarantees or take-or-pay clauses, where the government commits to paying even if volumes fall short. Risk-sharing mechanisms are crucial, particularly regarding waste supply, emission standards, and power tariffs. Examples from Singapore and Vietnam demonstrate how long-term revenue certainty is key to attracting private investment in capital-intensive WtE infrastructure.



Landfill Operations

Private sector involvement in landfill management can improve environmental compliance and operational efficiency. Companies can implement advanced landfill technologies, such as leachate treatment systems and methane capture, to minimize environmental impact. This often includes operation and maintenance (O&M) contracts, design-build-operate (DBO) arrangements, or long-term concessions. In O&M contracts, the private firm operates a publicly owned landfill and is paid based on performance metrics such as leachate treatment, volume reduction, and compliance with environmental standards. In concession models, the private operator may design, finance, and operate the facility and recover costs through user fees or tipping fees paid by municipalities. Closure and post-closure care may also be outsourced, particularly when methane capture systems or waste-to-energy extensions are involved. Contractual clarity is critical, especially regarding ownership of landfill infrastructure, responsibility for regulatory compliance, and mechanisms for dispute resolution.





The following section provides illustrative examples of how these entry points are being operationalized in practice across the ASEAN region, including Municipal (2.3) and Tourism (2.4) sectors.

2.3.

Private Sector Roles in Municipal Waste Management

Hybrid or Community-Driven Transition Models are emerging approaches in the ASEAN region that blend top-down industrial strategies with bottom-up, community-driven initiatives. These models support a gradual shift in responsibility from the public sector to private actors, facilitating a more adaptive and inclusive transition. While private sector involvement remains uneven across the region, there is a growing number of pilot projects that integrate private actors into community-based waste management systems.

Hybrid transition models offer a flexible pathway for scaling up private sector involvement, with roles and responsibilities evolving in tandem with improvements in local capacity, institutional readiness, and regulatory frameworks. This approach ensures that private sector participation grows in alignment with both community needs and national policy priorities, fostering a more resilient and context-specific waste management system.

Malaysia

The USEPA-COBSEA piloted an Integrated Waste Management System in Mersing Islands, Malaysia in partnership with the Reef Check Malaysia through community-based waste management solutions. The project aimed to address the pollution challenges faced by small remote islands through education and awareness raising, investment in essential infrastructure and equipment, and development of various funding mechanisms. The project reflects Malaysia's broader reliance on community-based waste management in rural and island areas, where private sector involvement is limited⁹.

In contrast, the urban areas have implemented PPPs, notably through concessionaires like Alam Flora Sdn Bhd (similar to Ltd. or Private Limited Company) in Kuala Lumpur, under the Solid Waste Management and Public Cleansing Act (2007). Alam Flora demonstrates how PPPs can enable innovation in urban waste management, using digital tools like GeoFlora to achieve 100% daily job completion, 90% route optimization, and a 20% reduction in missed collection penalties¹⁰.

However, these improvements remain concentrated in urban areas, underscoring the need to address uneven PPP implementation and integrate community-based models in rural regions to ensure nationwide impact.



Source: squarespace.com (UNEP-COBSEA, 2022)

9. UNEP, 2023. Integrated Solid Waste Management Good Practices to Prevent Plastic Marine Litter in the East Asian Seas Region: Mersing Islands, Malaysia -Community-based Waste Management - COBSEA Case Study Series.
10. AlamFlora. (2023). Lean and clean with GIS: Revolutionising waste management. Malaysia: Esri Malaysia

Philippines

As mandated by the Ecological Solid Waste Management Act of 2000 (RA 9003), the Philippines operates under a decentralized system where Local Government Units (LGUs) are primarily responsible for waste management. An example of LGU's innovation is the Iloilo City government had decided to develop a new Waste Management Center with integrated landfill. However, the proposed area is adjacent to the presently used dumpsite where more than 300 waste pickers dwell and depend on waste picking as their source of livelihood. To mitigate any social economic impact, in 2009, the local government initiated the formation of a new livelihood association called the USWAG Calahunan Livelihood Association Inc. (UCLA).

The main objective is to formalize the status of the waste pickers as waste worker and enroll them into skills development programs in order to strengthen them as partner of the municipality. While community-based models like UCLA have empowered informal workers and improved collection, technical gaps and inconsistent local capacity persist. Nevertheless, there are growing examples of private sector involvement in municipal systems, such as the Clark Sanitary Landfill operated by Metro Clark Waste Management Corp. under a concession agreement, serving over 100 LGUs across Luzon.



Source: <https://www.ioliotoday.com/> (IOLIO Today, 2025)

Indonesia

Indonesia's decentralized waste management system results in local governments innovating to mix community-based models with private sector involvement. The Gianyar Waste Recovery Project in Bali is initiated by the Rotary Club of Bali Ubud and Non-Governmental Organization (NGO) Bali Fokus where they established a composting facility processing 60 tons/day using forced aeration composting technology and has achieved ISO 9001 certification. In 2008, the project became the first in Indonesia to register under the Kyoto Protocol's Clean Development Mechanism (CDM) which enabled them to generate carbon credit revenue. While the facility itself is community-run, equipment procurement, carbon trading, and compost marketing involved private and international actors, formalized through a Memorandum of Understanding (MoU) between the village, district, and the Temesi Foundation. In Jakarta, a Refuse-Derived Fuel (RDF) facility developed under a Design-Build-Operate (DBO) contract illustrates urban PPP potential, but its operations are delayed, reflecting common challenges in PPP enforcement and scaling.



Source: <https://www.endplasticwaste.org/> (Alliance to End Plastic Waste, 2020)

2.4.

Private engagement in Waste Management in Tourism

The private sector also plays a growing role in managing waste in tourism-focused areas. While often driven by NGOs, hospitality groups, or resort operators, these examples show how circular approaches are being tested in real-world contexts.

- **Bali, Indonesia:** In Bali's tourism hotspots, private actors are increasingly involved in addressing waste challenges. ecoBali, now part of PT Waste4change Alam Indonesia, provides regulated waste collection, sorting, recycling, and composting services to tourism businesses through its Material Recovery Facility (MRF). The Community Waste Project (CWP), initiated by Potato Head and partners, is a nonprofit that processes waste from hospitality businesses and transforms it into usable products, aiming to cut landfill waste by over 90 percent. Sungai Watch installs barriers in rivers near tourist areas to prevent plastic leakage into the ocean. Bali Tourism Polytechnic, a tourism-focused vocational school, supports waste awareness through coastal cleanups and student engagement. These examples show how private actors contribute across infrastructure, innovation, and education, supporting more circular and decentralized tourism waste management in Bali.



Source: <https://www.nowbali.co.id/> (Now Bali, 2024)

- **Phuket, Thailand: Zero Waste Initiative.** Phuket has implemented a "Zero Waste" initiative to manage the waste generated by its tourism industry. The initiative emphasizes on reducing waste at the source, promoting recycling, and converting organic waste into compost. Hotels and resorts in Phuket are encouraged to adopt sustainable practices, such as reducing single-use plastics and implementing waste segregation systems. As a result, this initiative has led to a significant reduction in the volume of waste sent to landfills and has enhanced the island's environmental sustainability¹¹.



Source: <https://www.asiasustainabletravel.com/> (Asia Sustainable Travel, 2024)

- **Luang Prabang, Lao PDR: Sustainable Waste Management in Heritage Sites** Luang Prabang, a United Nations Educational, Scientific, and Cultural Organization (UNESCO) World Heritage site, has implemented sustainable waste management aimed at preserving its cultural and natural heritage. The city has introduced waste segregation at source, recycling programs, and community education campaigns. Waste collection is jointly managed by the municipal Urban Service Office and private companies, each covering about 40 villages¹². Private operators also contribute to recycling and disposal services, supporting the city's sustainability goals. These initiatives

11. Chuenwong K., Wangjiraniran W., Pongthanasawan J., Sumitsawan S., Suppamit T. 2022. Municipal solid waste management for reaching net-zero emissions in ASEAN tourism twin cities: A case study of Nan and Luang Prabang. www.cell.com/heliyon
12. Vacha, Y. (n.d.). Luang Prabang city presentation. Luang Prabang Urban Service Office. Retrieved from https://www.jasca2021.jp/1st/pdf/WS5/Luang_Prabang.pdf

have not only improved waste management but have also strengthened reputation of the city as a sustainable tourism destination.



Source: <https://urbanlaofullbright.wordpress.com/> (Urban Lao Full Bright, 2015)

- **Song Saa Private Island, Cambodia: A luxury eco-resort in Koh Rong Archipelago, has led Cambodia's first island-based solid waste management system in partnership with local communities.** Through its foundation, the resort established waste collection, composting, and circular reuse programs, diverting over 170 metric tons of trash and 200+ metric tons of ocean plastics. The resort's leadership extended beyond its premises by initiating community-led waste management in the nearby village of Prek Svay, including the establishment of a waste management station, formation of a local waste collection team, and delivery of educational workshops to foster environmental stewardship¹³. While hyper-local, the initiative demonstrates how private sector leadership can foster community-driven circularity in remote tourism contexts¹⁴.



Source: <https://www.facebook.com/FacebookSongSaaFoundation>, 2025)

- **The case of Hoi An: Multi stakeholders initiative in tourism waste management in Vietnam.** In Hoi An, integrated waste management has been developed as a strategic response to the growing environmental pressures associated with tourism in the historic city center. As a globally recognized heritage destination designated by UNESCO, the city has implemented a coordinated system that brings together municipal authorities, tourism businesses, community groups, and informal waste collectors to manage tourism-related waste more sustainably. The main objectives of these initiatives are to reduce waste leakage into the environment, particularly the Thu Bon River, minimize single-use plastics in tourism operations, and improve waste segregation and recycling practices across hotels, restaurants, markets, and public spaces. In Hoi An, the Green Youth Collective (GYC) and REED (REgenerate E.cological D.iversity) demonstrates how a locally operated social enterprise can strengthen tourism waste management beyond isolated business initiatives. Acting as an intermediary, REED brings together public authorities, tourism businesses, technical partners, donors, and community groups, and translates this coordination into practical zero-waste services and programmes. These include support for more than 50 hospitality businesses on waste reduction and diversion, organic waste treatment at community level that diverts half a ton of organics daily from landfill, reuse-refill solutions delivered through partnering social enterprise, and tailored zero-waste training for local authorities, community leaders, women, and youth. The model also includes the operation of a decentralised, community-based zero-waste centre using underused public infrastructure, linking tourism waste management with broader community circular initiatives. The Hoi An case further suggests that locally embedded intermediary organisations can help connect private sector participation in tourism with wider destination-level waste reduction systems.

13. https://www.asiasustainabletravel.com/articles/sustainable-waste-management-hospitality?utm_source=chatgpt.com

14. <https://songsaafoundation.org/>



03

FRAMEWORKS SUPPORTING PRIVATE SECTOR INVOLVEMENT

Any form of public-private cooperation or private sector involvement requires a clear legal and institutional framework, well-defined roles and responsibilities, mutual accountability, and mechanisms for risk-sharing and financial viability. Without these foundational elements, partnerships are unlikely to be effective, sustainable, or attractive to private actors.

The following chapters outline the enabling environment required for the private sector to invest, innovate, and scale in waste management systems.

Section 3.1 addresses Policy Instruments, focusing on legal certainty, governance structures, risk allocation, stakeholder inclusion, and knowledge platforms. Section 3.2 presents Incentives and Disincentives Mechanisms, outlining how financial, regulatory, operational, and behavioral levers can align private sector profitability with public sector sustainability objectives.

To be effective and sustainable, public-private partnerships require foundational elements including a clear legal and institutional framework, well-defined roles and responsibilities, mutual accountability, and a mechanism for risk-sharing and financial viability.

3.1. Policy Instruments

Well-designed incentives and disincentives can drive market behavior and investment decisions in ways that support private sector participation. While some measures target producers directly, others influence consumer behavior or create conditions for scalable business models aligned with sustainability goals.

Extended Producer Responsibility (EPR) Scheme

EPR programs require manufacturers to take responsibility for the end-of-life management of their products, which in turn necessitates active involvement from private sector recyclers and waste service providers to deliver take-back, sorting, and recovery services. In well-designed EPR systems, producers that perform beyond compliance, such as exceeding recycling or collection targets, may benefit from incentives like reduced EPR fees, eligibility for eco-labelling, or public recognition. For example, Thailand's EPR pilot program encourages manufacturers to integrate circular product design and fund recycling initiatives, aligning private innovation with national sustainability goals.

Emission Standards and Waste Reduction Targets

These can indirectly incentivize private investment in cleaner waste processing technologies. Governments can set mandatory waste reduction or emissions targets while allowing companies that outperform them to earn carbon credits, environmental tax breaks, or other financial rewards. Conversely, companies that fail to meet targets may face landfill taxes, emissions fines, or restrictions on expansion. This structure aligns private profit motives with public environmental goals.

Complementary Policy Instruments

Digital Pay-As-You-Throw (PAYT) systems also open the door for startups and tech companies to partner with municipalities, e.g. in deploying Radio Frequency Identification (RFID) bins, billing platforms, and analytics dashboards.

Global Good Practice: South Korea PAYT and Food Waste Management

South Korea has made significant progress in addressing food waste. A key milestone was the introduction of a mandatory waste recycling program issued in 2013 which requires households to separate their food waste and dispose of it in designated bins. The waste is then collected and processed into biomass, compost or animal feed. As a result, the amount of food waste produced in South Korea is reduced by 10 percent during the period of 2013 and 2019. The country also implemented a “pay as you throw” policy and other technologies applications such as Envac’s Automated Waste Collection System (AWCS) which uses sensors connected directly to RFID system issued by the building management, where the household/individual located ensure 90 percent of the discarded food is kept out of the landfill and incinerators. The PAYT policy encourages households to reduce food waste by making them more aware of the price and environmental impact of throwing away excess food¹⁵.

While this model has strong potential, its adoption in ASEAN cities would require contextual adjustments. Key enablers include adequate infrastructure for digital monitoring, strong policy frameworks to support enforcement, and public education campaigns to encourage waste segregation and participation. Pilot programs in cities like Bangkok and Hanoi have shown that with tailored design and sufficient investment, PAYT and smart collection systems can be feasible and effective in Southeast Asian urban contexts.

Involving the private sector in sustainable solid waste management across both municipal and tourism sectors requires not only political commitment but also stronger policies and inclusive governance. Successful policy examples in the ASEAN region show that while strong framework conditions are crucial, they are often undermined by implementation gaps, a lack of local capacity, or weak enforcement mechanisms, which limits effectiveness in practice. These experiences highlight that policies must be not only well-designed, but also practical to implement, widely consulted, and consistently enforced to ensure credibility and effectiveness.

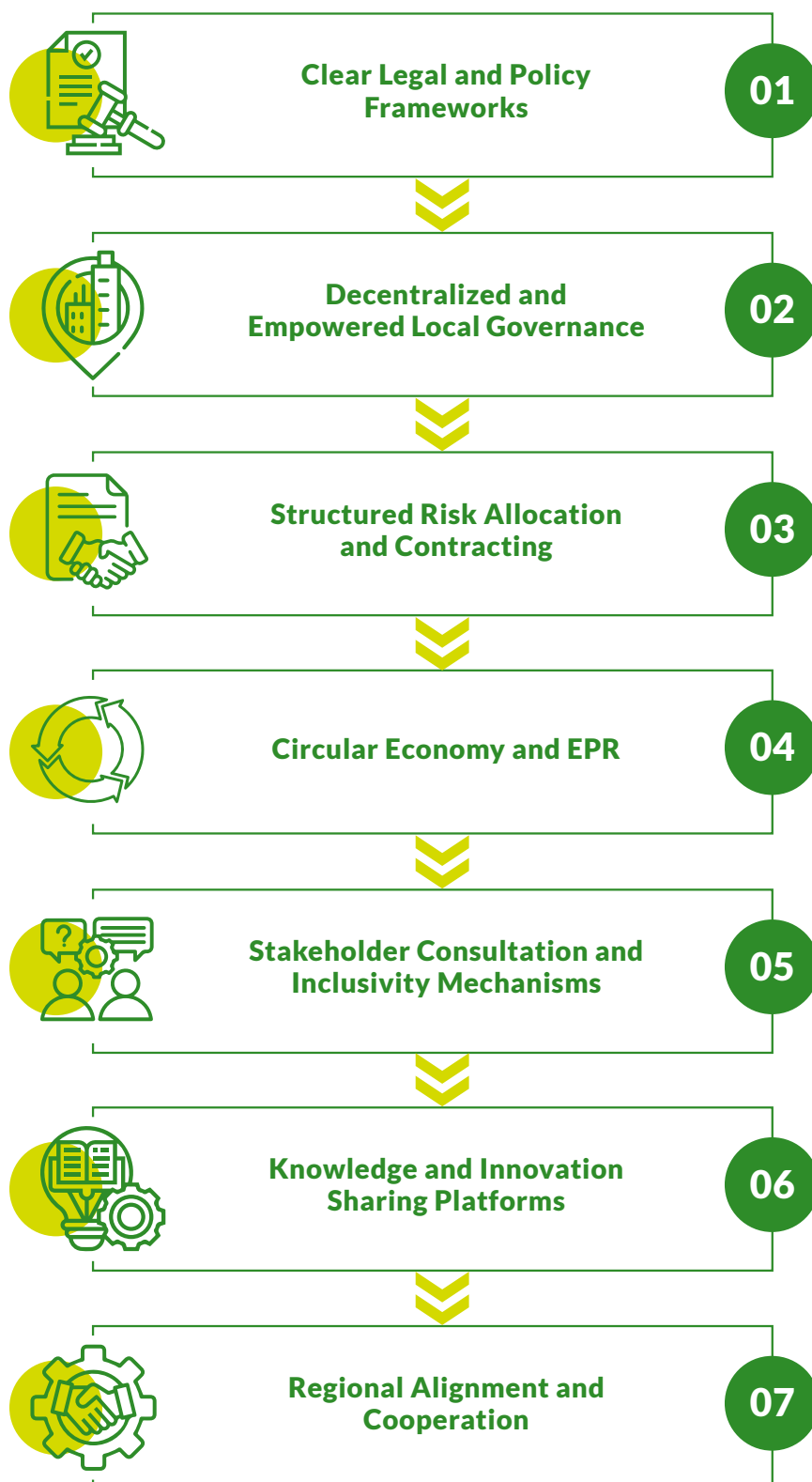


Source: <https://rri.co.id> (RRI, 2024)

15. <https://www.envacgroup.com/insight/tackling-food-waste-south-koreas-success-story/>

The following recommendations, drawn from case studies in ASEAN and international guidance, are critical for unlocking sustainable private sector involvement in both municipal and tourism waste management:

Key to unlocking sustainable private sector involvement in waste management



The following sections provide national and regional examples of how AMS are applying these six regulatory and institutional frameworks and principles to support private sector involvement in solid waste management.

3.1.1.

Clear Legal and Policy Frameworks

Establishing clear, supportive policies and regulations is crucial for attracting private sector investment. Governments should create an enabling environment that includes incentives such as tax breaks, subsidies, and streamlined permitting processes. These legal frameworks must ensure certainty and protect private sector rights to operate, while clearly defining the roles and responsibilities of each actor in waste management^{16,17}. In the case of EPR, effective policy and involvement of the private sector rely on a clear division of roles and robust governance instruments: governments provide strategic direction, regulatory oversight, and enforcement. Producers and Producer Responsibility Organizations (PROs) take the lead in operational activities



Source: [https://blogs.worldbank.org \(Worldbank Blogs, 2017\)](https://blogs.worldbank.org (Worldbank Blogs, 2017))

such as collection, recovery, and recycling. Clearly defined obligations, supported by transparent monitoring, reporting, and verification systems, are essential to strengthen compliance, reduce free-riding, and create a level playing field that enables fair competition and sustained private sector participation.

Without these foundations, risk allocation and long-term investment security are undermined, making partnerships difficult to sustain¹⁸.

Singapore



Source: <https://www.gov.sg/> (Ministry of the Environment and Water Resources / National Environment Agency, 2019)

Singapore has issued the Singapore Zero Waste Masterplan (2019-2030) and the Singapore Green Plan. These plans aim to balance economic development, circular economy and environmental sustainability including a target of reducing the volume of waste disposed of by 30% by 2030. The Zero Waste Masterplan is supported by the Resource Sustainability Act (2019), which introduces regulatory measures such as EPR for e-waste and packaging waste, mandatory packaging data reporting, and mandatory food waste segregation for large food waste generators, clearly defining private sector roles. Incentives such as tax benefits and cash grants further encourage private investment in recycling and waste treatment services. For example, the Enterprise Sustainability Programme provides up to \$180 million to help Singaporean companies, especially SMEs, strengthen their sustainability capabilities and seize green opportunities. Over four years, at least 6,000 enterprises will benefit through support for training, capability and product development, certification and financing.

16. ASEAN Secretariat. (2014). ASEAN Public-Private Partnership (PPP) Principles. Jakarta: ASEAN Secretariat.

17. United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP). (2016). Public-Private Partnerships and the Sustainable Development Goals: Inter-agency Task Force on Financing for Development Issues Brief. Bangkok: UNESCAP.

18. Asian Development Bank (ADB). (2008). Public-Private Partnership Handbook. Manila: Asian Development Bank.



Source: <https://doh.gov.ph/> (Department of Health Philippines, 2021)

The Philippines' Ecological Solid Waste Management Act (RA 9003) (2000) provides a structured legal framework for municipal solid waste management. It mandates the establishment of MRFs and encourages Local Government Units (LGUs) to engage private entities in waste collection and recycling. Fiscal incentives, including tax and duty exemptions and tax credits for recycling activities, further support private sector involvement. While RA 9003 aligns with the "Clear Legal and Policy Frameworks and Supportive Policies" pillar, uneven implementation across LGUs, particularly in segregation at source and MRF operation, remains a key challenge.

3.1.2.

Decentralized and Empowered Local Governance

In ASEAN countries, local governments play a critical role in enabling private sector involvement by addressing context-specific waste management challenges. Empowering municipalities with regulatory authority and responsibility for resource allocation enables faster decision-making, better service customization, and more meaningful partnerships with local private operators¹⁹. Decentralization must, however, be accompanied by national-level frameworks that provide guidance and capacity-building

to avoid fragmentation or inconsistent standards. Other emerging approaches in the ASEAN region include hybrid transition models that blend top-down industrial strategies with bottom-up, community-driven initiatives. Hybrid transition models offer a flexible pathway for scaling up private sector involvement, with roles and responsibilities evolving in tandem with improvements in local capacity, institutional readiness, and regulatory frameworks. This approach ensures that private sector participation grows in alignment with both community needs and national policy priorities for a more resilient and context-specific waste management system.

Vietnam has adopted decentralized governance policies that empower local authorities to plan waste services, tender contracts, collect service fees, and monitor private providers. This enables faster decision-making and service customization, addressing local waste management challenges more effectively. National frameworks like the Integrated Solid Waste Management Strategy and Circular Economy Strategy provide overarching guidance, preventing fragmentation. These policies support private sector involvement mainly in municipal waste management through incentives such as tax exemptions and land access. However, short-term annual contracts for waste collection discourage long-term private investment, highlighting the need for improved contracting standards.

19. Economic Research Institute for ASEAN and East Asia (ERIA). (2020). Regional Waste Management: Inter-municipal Cooperation and Public-Private Partnerships. Jakarta: ERIA.

Since the enactment of Law No. 18/2008 on Waste Management, Indonesia has decentralized waste management responsibilities to local governments, granting them authority over planning, contracting, fee collection, and monitoring of waste services. This decentralization has enabled municipalities to engage private sector partners and tailor waste solutions to local needs. For instance, initiatives like the Bersih Indonesia project in Malang Regency demonstrate effective collaboration between municipal authorities, private companies, and communities to develop integrated waste systems, including MRF and paid collection services. However, challenges persist, such as limited local budgets and inconsistent enforcement, which can hinder the scalability and sustainability of such decentralized approaches.

3.1.3.

Structured Risk Allocation and Contracting

Developing robust PPP frameworks requires not only broad collaboration between public authorities and private companies but also precise structuring of contractual relationships. Successful PPP models must clearly define risk allocation, ensuring that each type of risk - whether construction, operational, market demand, or environmental compliance - is assigned to the party best equipped to manage it. Contracts must articulate these allocation explicitly through mechanisms such as performance-based service agreements, minimum revenue guarantees, take-or-pay

clauses, or termination compensation terms. Transparent bidding processes, standardized contract templates, and enforceable dispute resolution mechanisms are also essential for safeguarding public interests while at the same time providing sufficient commercial certainty for private investors. In addition to well-structured contracts, governments and development partners can provide external risk mitigation mechanisms to improve bankability and reduce investor hesitation in high-risk environments. These tools complement risk allocation terms in PPP contracts by covering external shocks or uncertain market conditions.



Source: <https://mycommunity.org.sg/> (My Community Singapore)

The TuasOne Waste-to-Energy Plant (TuasOne) was developed under Singapore's Public-Private-Partnership framework to provide waste incineration services to the National Environment Agency (NEA). It is the country's sixth WtE facility and the second implemented under a Design-Build-Own-Operate (DBOO) model. The private partner, Mitsubishi Heavy Industries Environmental & Chemical Engineering (MHIEC ECO Creation Singapore), is responsible for designing, building, owning, and operating the plant during the concession period. NEA retains regulatory oversight, sets clear performance standards, and assumes demand and revenue risks through long-term service contracts, thereby mitigating revenue risks for the private operator. This model safeguards public interests and ensures commercial certainty and efficient delivery of large-scale waste infrastructure projects.

Philippines



Source: <https://www.panaynews.net/> (Panay News, 2020)

The Municipality of Malay's landfill project, covering Boracay Island, showcases structured contracting through a Build-Operate-Transfer (BOT) scheme with the private company ECOS Sanitary Landfill. The private sector assumed responsibility for financing, designing, constructing, and operating the landfill over a 15-year period, while ownership remains public. Construction and operational risks are borne by the private partner, while the municipality ensures regulatory oversight and land provision. Payment is based on agreed service fees tied to operational performance. Although the scale is smaller than national projects, the BOT contract articulates operational standards and post-transfer obligations, reducing ambiguity. This example demonstrates how even smaller municipalities can leverage structured PPPs to attract private investment while managing risks effectively.

Malaysia



Source: <https://alamflora.com.my> (Alam Flora)

In Kuala Lumpur, the long-term concession awarded to Alam Flora Sdn Bhd demonstrates structured risk-sharing in urban waste management. The concession model allocates operational and performance risks to the private operator, who manages waste collection, transportation, and disposal. The public sector (Kuala Lumpur City Hall) retains responsibility for regulatory enforcement and public engagement. Revenue is secured through service payments indexed to inflation and performance metrics, providing financial predictability to the private partner. Although some contracts were initially less standardized, later reforms emphasized clearer performance benchmarks and penalties for non-compliance. This case highlights how urban waste PPPs can align operational incentives, allocate risks appropriately, and ensure service quality over long concession periods.

3.1.4.

Circular Economy and Extended Producer Responsibilities (EPR)

Engaging the private sector in circular economy and waste management activities create additional revenue streams and reduce waste. EPR systems allocate responsibility for the end-of-life management of products placed on the market to obliged entities, which in turn incentivises more sustainable product design and post-consumer recovery. This is limited to the regulated products and is intended to complement rather than replace the local government's role to ensure waste

management as a public service. Additionally, this reflects the contribution of the company in the circular economy and creates valuable image to company sustainability. In practice, Producer Responsibility Organisations (PROs) can serve as an institutional mechanism through which private sector actors collectively organise and fulfil such obligations, enabling coordination and efficiency parallel with government regulation and oversight. Several ASEAN countries recognize their potential to enhance waste management systems and sustainable practices in both manufacturing and consumption and have been implementing or exploring EPR schemes:

Thailand

Thailand is actively developing its EPR framework under the National 3R Strategy (Reduce, Reuse, Recycle), which focuses on plastic waste management. Pilot programs like the PackBack project launched in Chonburi Province in January 2024. This initiative involves 10 local administrative offices and aims to test EPR models tailored to Thailand's context by 2027. The Thailand Institute of Packaging and Recycling Management for Sustainable Environment (TIPMSE) is spearheading these efforts, focusing on integrating informal waste collectors, establishing Producer Responsibility Organizations (PROs), and implementing eco-modulation fees to incentivize sustainable packaging designs. Additionally, Thailand's Board of Investment offers subsidies and tax exemptions to companies investing in environmentally-friendly packaging and recycling facilities as well as developing digital platforms for waste management solutions as part of its roadmap to reduce plastic waste by 2030. These combined regulatory and financial measures aim to promote a circular economy by encouraging producers to take responsibility for the entire lifecycle of their products.

Philippines

The Philippines enacted the Extended Producer Responsibility Act of 2022 (Republic Act No. 11898), mandating large enterprises with assets over PHP 100 million to recover a specified percentage of their plastic packaging waste, starting at 20% in 2023 and increasing to 80% by 2028. The law covers various plastic products, including flexible packaging, rigid containers, plastic bags, and polystyrene. Companies can comply individually or through PROs, with mechanisms like deposit return systems being piloted to enhance recovery rates. By the end of 2023, 947 companies had registered under the EPR program, collectively recovering and diverting 163,000 metric tons of post-consumer plastic packaging waste, surpassing the initial 20% recovery target. The EPR Act also emphasizes integrating the informal waste sector, recognizing their crucial role in waste collection and recycling, and aims to provide them with better support and inclusion in formal waste management systems.

Indonesia

Indonesia's Ministry of Environment and Forestry Regulation No. P75/2019 establishes a roadmap for producers to reduce packaging waste by 30% by 2029. This regulation mandates producers in manufacturing, retail, and food and beverage sectors to implement the strategies. The intervention including limitation/reduce, recycle, and reuse of packaging and product such as redesigning for recyclability/using recycled materials, establishing take-back systems, and promoting reuse/refill. To support these initiatives, the government acknowledges and in process developing the EPR system. Additionally, Indonesia launched the "Zero Waste Zero Emission 2050" framework in July 2024, promoting collaboration with private sector actors like the APP Group and Bank Sampah Digital to advance circular economy practices and reduce waste generation at the source.

Vietnam

A scoping study on a nationwide Deposit Return System (DRS) for Vietnam, commissioned by the Norwegian Embassy in Hanoi and Innovation Norway assesses the feasibility and potential impacts of implementing a deposit-refund scheme for single-use beverage containers such as PET bottles and aluminium cans. The study proposes a system where consumers pay a small refundable deposit typically around VND 1,000–2,000 per container, which is returned when empty containers are brought back to designated return points such as retailers or collection depots. The analysis indicates that a well-designed DRS could substantially improve collection and recycling performance by generating an additional 21,000–77,000 tonnes of beverage containers collected annually, enabling up to 300,000 tonnes of closed-loop recycling. The study also suggests that introducing a DRS that is aligned with Vietnam's Extended Producer Responsibility (EPR) framework under the 2020 Law on Environmental Protection will present a viable opportunity to strengthen recycling systems and accelerate the country's transition toward a circular economy.

3.1.5.

Stakeholder Consultation and Inclusivity Mechanisms

Meaningful stakeholder consultation and engagement mechanisms are essential to ensure the long-term acceptance and success of waste management projects. ASEAN PPP Principles (2014) and UNESCAP PPP for the SDGs (2016) stress that partnerships should involve not only governments and private firms, but also communities, civil society organizations, and informal sector representatives. Within the regional context, ASEAN has also established a Focal Group on the Circular Economy (FG-CE) with its first regular meeting in 2024. The FG-CE was established to support and operationalise ASEAN's Framework for Circular Economy for the ASEAN Economic Community (AEC). Its mandate lies strategically on coordination,

monitoring, and strategic guidance for circular economy policies, programmes, and harmonisation among ASEAN Member States. To support its function, an Independent Advisory Panel (IAP) has been established. IAP is a group of external experts and stakeholders brought into FG-CE's work to provide guidance, technical insight, and support. IAP is currently working as an internally permanent ASEAN body but rather a panel of specialists and advisors from outside the ASEAN Secretariat. This section highlights selected best practices in stakeholder consultation and inclusivity mechanisms, drawing from Malaysia, Indonesia, and Thailand, as well as emerging efforts from Cambodia, Vietnam, and Lao PDR, reflecting the diversity of approaches across ASEAN Member States.

Malaysia

Malaysia has institutionalized multi-stakeholder engagement through initiatives such as the Plastic Sustainability Roadmap 2021–2030, which was developed after extensive consultations with businesses, consumers, NGOs, academia, and informal waste workers. The Ministry of Environment and Water (KASA) organized national and regional workshops to gather feedback on EPR policies, plastic use reduction, and recycling system improvements. The inclusive policy-making process has succeeded in ensuring smoother acceptance and implementation, especially for disruptive regulations such as the ban on single-use plastics.

Indonesia

Indonesia's approach to integrating informal sector voices into policymaking is exemplified by initiatives like the Jejaring Pengelola Sampah Mandiri (JPSM) or Waste Bank Network and the drafting of EPR regulations under the Ministry of Environment (KLH). Policy development included formal hearings with community-based organizations (CBOs), recycling cooperatives, and informal collector associations (e.g., Asosiasi Pemulung Indonesia). Such stakeholder consultations are often conducted through multistakeholder forums and public dialogues organized at the national and city levels, ensuring grassroots perspectives are included in regulation design. In addition, Indonesia has made strides in formalizing the informal sector by supporting Waste Bank schemes where informal waste collectors are registered, trained, and integrated into municipal recycling programs, giving them greater legal and social protection, e.g. in Manado through the ASEAN-Germany Cooperation project [Reduce, Reuse and Recycle to protect the Marine Environment and Coral Reefs](#) (3RproMar).

Thailand

Thailand's Department of Environmental Quality Promotion (DEQP) has fostered collaborative waste initiatives by mandating consultation sessions between local authorities, community organizations, and private sector waste contractors, especially under the National 3R Strategy. One notable model is the provincial waste management committees, where NGOs, academia, private haulers, and community leaders formally participate in approving local Sustainable Waste Management (SWM) plans. Thailand has also advanced the formalization of informal waste collectors by creating city-registered recycling groups and cooperatives, enabling waste pickers to access training, social benefits, and formal contracting opportunities with private sector recyclers. This mechanism ensures that not only technical but also social dimensions are considered in project planning and enforcement.

Cambodia

Cambodia's Solid Waste and Plastic Management Improvement Project, supported by the World Bank, mandates that contractors assign trained grievance officers to actively handle complaints and suggestions from community members, waste workers, and vulnerable groups. This system ensures that project implementation is responsive to stakeholder concerns, helping to build public trust in private sector waste contractors, especially in Phnom Penh and Siem Reap.

Vietnam

Vietnam has integrated stakeholder input into solid waste planning through initiatives like the National Strategy on Integrated Solid Waste Management, where local governments are encouraged to consult with communities when designing collection systems. Although practices vary by province, cities like Ho Chi Minh have piloted community consultation sessions before awarding private waste collection contracts, aiming to increase transparency and service acceptance.

In Lao PDR, though formal mechanisms are still developing, programs like the Vientiane Urban Development Project funded by Asian Development Bank (ADB) have included mandatory community consultations in planning waste collection upgrades and recycling pilots. Communities are invited to meetings where private sector bidders present their waste management proposals and receive feedback, which is then considered in tender evaluations.

3.1.6.

Knowledge Sharing Platforms

Establishing platforms for public-private knowledge sharing and collaboration promotes replication of best practices and continuous innovation. While traditional PPP guidance mentions capacity-building, there is a growing need to move beyond one-off training towards creating continuous knowledge hubs and digital collaboration platforms. Notable examples include:

ASEAN Environment Knowledge Hub:

A centralized portal for governments, businesses, and civil society to exchange environmental best practices, including waste management (<https://environment.asean.org/>)

ASEAN Circular Economy Stakeholder Platform:

Hosted by ASEAN Centre for Sustainable Development Studies and Dialogue (ACSDSD), this platform enables collaboration and policy development for circular economy initiatives such as recycling and sustainable materials management (<https://ce.acsdsd.org>).

ASEAN Municipal Solid Waste Management Enhancement (AMUSE) Project:

Led by GIZ, AMUSE strengthens solid waste systems in cities and tourist destinations through cross-sectoral dialogues involving private and public stakeholders (<https://www.giz.de/en/projects/asean-municipal-solid-waste-management-enhancement>)

ASEAN Access: Managed by the Office of SMEs Promotion, Thailand (OSMEP), and is developed with the support of the German Development Cooperation (GIZ). This online portal serving as a first port of call for ASEAN SMEs and other businesses for information on trade and market access in ASEAN. (<https://www.aseanaccess.com>)

Regional Knowledge Centre for Marine Plastic Debris

Managed by ERIA, featuring The Private Sector Platform (PSP) to promote good practices and innovative actions taken by private sector actors in the ASEAN+3 region. Businesses can utilise the PSP to showcase the products, services and technologies that are helping reduce plastic waste. (<https://rkcmpd-eria.org>)

These initiatives demonstrate how ASEAN is moving beyond one-off capacity building efforts toward more systematic, continuous knowledge-sharing hubs to support sustainable and inclusive waste management innovation across the region. However, there remains significant potential to strengthen dedicated knowledge and innovation sharing hubs focused on scaling PPP best practices in the waste sector.

3.1.7.

Regional Alignment and Cooperation

Regional alignment and cooperation can play an important role in enabling private sector involvement in waste management and circular economy activities in ASEAN. Fragmented standards, regulatory approaches, and compliance requirements across AMS increase costs for private actors operating across borders and limit the development of viable regional markets for recyclable and recycled materials. As highlighted in the ASEAN Regional Action Plan for Combating Marine Debris in the ASEAN Member States (2021 – 2025), AMS apply different packaging standards and regulatory approaches that reflect national contexts, making full harmonisation neither feasible nor desirable. However, greater coordination through shared design principles, technical standards, and pre-competitive platforms can reduce compliance complexity and improve the commercial viability of private sector solutions by supporting scale and cross-border material flows.

The ASEAN Regional Action Plan also underscores the importance of regional coordination mechanisms that bring together governments, the private sector, industry associations, and other stakeholders to address marine debris and advance circular economy objectives. In addition to the examples mentioned in the previous subsection 3.1.6. Knowledge Sharing Platforms, below are further notable examples of regional multi-stakeholder platforms that support coordinated action and private sector involvement:

ERIA Regional Knowledge Centre for Marine Plastic Debris (RKC-MPD)'s Extended Producer Responsibility (EPR) for Plastics and Packaging Webpage: A reference point for EPR initiatives related to plastic and packaging across ASEAN+3 Member States, practices in both ASEAN+3 and Member States, and the challenges and opportunities available (<https://rkcmpd-eria.org/extended-producer-responsibility>)

3.2.

Incentives and Disincentives Mechanisms

While regulatory and institutional enablers establish the essential foundations for private sector involvement, effective participation also requires a balance between rewards and penalties. Financial incentives and regulatory rewards motivate companies to invest, while sanctions and compliance requirements discourage unsustainable practices. Therefore, creating a balanced incentive and disincentive strategy is essential to encourage private sector participation in sustainable waste management.

In the following are some examples on the models of the incentives and disincentives mechanism that might attract the private sector involvement in sustainable waste management.

3.2.1.

Financial and Market-based Incentives

ASEAN countries such as the Philippines, Thailand, and Malaysia have experimented with hybrid approaches combining market incentives and regulatory mandates, providing useful lessons for future policy design. Successful implementation requires enabling legislation, strong monitoring systems, and complementary support to scale up informal sector integration and behavior change at the community level. These instruments are effective policy tools that shift waste responsibility to producers and users, stimulating private sector innovation through price signals and market access.

To reduce operational risks and make sustainable waste management projects more financially viable, the following market-based instruments can be applied:



Subsidies and Tax Benefits

Provide tax breaks or subsidies for investment e.g. for recycling, composting, Waste to Energy (WtE) infrastructures. This includes introducing accelerated depreciation on green assets and subsidies on recycled materials to encourage early investment. For instance: Vietnam offers corporate tax incentives and feed-in tariffs for WtE operators. Similarly, Thailand offers subsidies and tax incentives for various WtE. However, evidence on the effectiveness of these incentives remains limited. A 2022 review of Vietnam's WtE projects showed that while incentives have spurred investment, challenges remain in securing consistent feedstock and maintaining financial viability without additional government support. Similarly, in Thailand, several WtE projects faced delays due to waste quality issues despite available fiscal incentives.



Access to Grants and Soft Loans

Offer soft loans or matching grants to reduce upfront capital costs. This includes partnering with development banks to offer blended financing models that include public and private sources of funding.



Performance-based Rewards

Provide additional financial incentives (bonuses) if certain sustainability targets, such as waste diversion rates or emissions reductions, are met. This includes performance-based payment contracts to align public and private objectives. However, in some regions, payment schemes based solely on waste collection and landfill volumes, showing that misaligned incentives can hinder recycling efforts and waste minimization goals.

Global Practices Insight: Ensuring Incentives Lead to Sustainable Outcomes

International experiences highlight that financial incentives alone are not sufficient without integrated system reforms, e.g. incentives should be linked to outcomes like recycling rates, energy efficiency, and environmental compliance, not just quantity of waste processed.

Japan's WtE Success

Japan complements subsidies with strict waste segregation policies and long-term waste supply guarantees for private operators. This reduces feedstock risks and improves project bankability

Source: World Bank, 2022; JICA Waste Management Case Studies

3.2.2.

Incentive mechanisms in Public Private Partnership (PPP) Models

PPP models are powerful mechanisms for mobilizing investment, know-how and innovation from the private sector. Clearly defined roles and an equitable distribution of responsibilities and risks between public authorities and private companies, as well as favorable contract terms, increase the financial viability and attractiveness of the partnership.



Long-Term Contracts and Minimum Revenue Guarantees

Long-term contracts (e.g., 15–30 years) are crucial because they allow private companies to amortize large capital investments over time, ensuring financial viability. Governments can enhance bankability further by offering disposal fees, minimum revenue guarantees, take-or-pay agreements, or guaranteed waste supplies to reduce revenue risk. Methods include implementing a co-investment model, where the government shares some of the investment risk to attract private investors. For example, Singapore's NEA provides revenue guarantees to WtE operators with a take-or-pay structure, as seen with the Keppel Seghers WtE plant.



Access to Public Land and Infrastructure

Reducing upfront capital costs is another critical incentive. Governments can offer land or facilities for waste management operations at concessional prices. This includes providing land for recycling plants, logistics facilities, and businesses that promote circular economy activities. In the Philippines, local government units (LGUs) provide land for joint WtE projects, thereby lowering entry barriers for private investors and reducing investment risk.





Green Procurement Policies

Preferential treatment in public procurement can serve as a behavioral incentive for sustainability. The government gives procurement preference to companies that follow sustainable waste management practices. Several ASEAN cities prioritize contracting companies with green certification or high recycling rates when awarding waste management contracts, encouraging companies to align their business models with environmental goals. This will encourage companies to develop and apply business models that align with national green procurement policies to benefit from them.



Carbon Credits and Environmental Compensation

Governments can allow private waste management and recycling projects to generate carbon credits for GHG reduction or receive environmental compensation, which can be sold on the carbon market. This offers additional revenue streams that reward superior environmental performance. However, thorough regulatory frameworks are needed to ensure that the scheme does not overclaim any compensation that may be perceived as double-counting.

3.2.3.

Behavioral and Social Incentives

To enhance private sector involvement, governments and stakeholders can leverage behavioral and social incentives in addition to financial measures. These may include mechanisms such as public recognition, award schemes, and alignment with Corporate Social Responsibility (CSR) objectives, which enhance reputational value and encourage voluntary participation.

CSR and ESG Alignment

Encouraging private companies to align with Environmental, Social, and Governance (ESG) goals to enhance brand value and attract impact investors. This includes providing sustainability awards, public recognition, or green procurement benefits to companies with waste reduction, recycling, and circular economy initiatives that contribute to sustainable waste management.

Public-Private Collaboration for Visibility

Facilitating partnerships with governments and NGOs that increase visibility of company efforts. This includes using public campaigns to highlight companies that actively participate in recycling initiatives. For example, public listing of “sustainability champions” among waste management companies can enhance positive visibility.



3.2.4.

Collaboration with the Informal Sectors

Several private sector actors in ASEAN have voluntarily partnered with informal waste collectors to strengthen recycling systems, even without government-led incentives. In Indonesia, Waste4Change collaborates with informal collectors via TPS3R sorting centers and organizes them into cooperatives, while Danone-AQUA's "AQUA Peduli Sampah" program partners with waste banks to purchase plastic waste and support community income. In Thailand, Wongpanit recycling centers offer transparent, stable prices for recyclables from informal pickers. In the Philippines, Plastic Credit Exchange (PCX) integrates informal collectors into corporate plastic offset supply chains. These initiatives often involve formalizing informal workers, ensuring fair pricing, and providing training. Although they demonstrate strong results in improving waste recovery and livelihoods, they remain fragmented. Scaling these models will require governments to develop enabling policies, incentives, and protections to formalize private-informal sector collaborations. Further, moving toward sustainable waste management systems also requires deliberate and integrated planning frameworks that recognize the informal sector as an essential operational partner rather than a peripheral or transitional actor.

In Vietnam, an initiative called VietCycle led by VietCycle Corporation works to strengthen the plastic waste collection and recycling system while promoting a circular economy and social inclusion. The initiative operates across several provinces in Vietnam, where it connects informal waste collectors, recyclers, and businesses into an integrated recycling network. Through this approach, VietCycle aims to address the country's growing plastic waste challenge while improving livelihoods for workers in the informal recycling sector.

The programme mobilises a nationwide collection network that is often referred to as "green warriors", and collaborates with international partners and companies to scale plastic recovery and recycling efforts.

As a result, the initiative has generated measurable environmental and social impacts. VietCycle has built a network involving more than 3,500 informal collectors and in 2022 alone collected and sorted over 16,000 tonnes of plastic waste from several Vietnamese provinces. These achievements demonstrate how coordinated private-sector initiatives can reduce plastic pollution, increase recycling rates, and integrate informal workers into a more formalised circular economy system.



Source: <https://mahijaparahitanusantara.com/>

A more integrated approach to responsible sourcing is illustrated by the Mahija Parahita Nusantara Foundation in Indonesia, initiated by Coca-Cola Europacific Partners Indonesia and co-founded with Dynapack Asia. The foundation works with more than 60,000 waste pickers and numerous community waste banks, connecting households, informal collectors, and micro-

and small-scale aggregators into a traceable recycling network. Collected PET bottles are channelled to Amandina Bumi Nusantara, Indonesia's first food-grade recycled PET facility, enabling a closed-loop bottle-to-bottle system. Beyond material recovery, the model strengthens traceability, supports women's leadership and financial inclusion through community waste banks, and demonstrates how responsible sourcing can be embedded into waste management infrastructure. Such integrated models provide a scalable blueprint for aligning private sector sourcing practices with inclusive waste management systems.

Integrated planning involving the informal sector should begin at the system design stage, not only during implementation. Governments and municipalities are therefore encouraged to adopt inclusive planning approaches that formally map informal sector activities, assess their contribution to material recovery, and identify complementarities with formal private operators. This allows public authorities to design hybrid systems in which informal and formal actors operate in parallel or in partnership and avoid negative competition.

3.2.5.

Monitoring, Accountability, and Enforcement

Monitoring, accountability, and enforcement mechanisms are critical to align private sector involvement with sustainable waste management goals and ensure compliancy with contractual obligations. Beyond setting standards, governments must establish clear systems to detect, reward, or penalize behavior systematically.

Waste Management Audits

Monitor private operators through regular audits to ensure compliance with environmental standards, with results linked to license renewals, contract extensions, or performance bonuses. For example, in Singapore, the National Environment Agency (NEA) requires waste management contractors to undergo environmental audits, with non-compliance affecting contract renewals (NEA Tender Guidelines 2020). For example, public Waste collectors need to obtain or have in place the ISO 14001 certification.

Penalty and Bonus Clauses in PPP Contracts

Include explicit clauses that fine companies for missing recycling, or emissions targets, and reward those exceeding targets with bonus payments or contract extensions. Example: In Thailand, concession contracts for municipal waste management services include penalties for missing collection standards and bonuses for higher recycling rates, as reported in Bangkok Metropolitan Authority (BMA) partnership reports.

Third-Party Independent Verification

Engage accredited independent auditors to verify private operators' self-reported data on recycling rates or emissions, ensuring transparency. Example: The Philippines' Department of Environment and Natural Resources (DENR) requires third-party verification for companies fulfilling their EPR obligations under Republic Act 11898 (2022).

3.3.

Summary of Insights from the ASEAN Region

Solid waste management in ASEAN shows diverse and evolving private sector involvement, from industrial-scale WtE to localized community-driven solutions. While some countries like Singapore and Vietnam have institutionalized PPP models with strong national policy backing, others like Indonesia and the Philippines rely on decentralized approaches with growing but uneven private sector participation. The use of waste-to-energy technologies, digital platforms, and recycling innovation continues to grow, along with the integration of the informal sector, and offer increasing opportunities for private engagements.

Private sector responds positively and have been strongest where governments offer clear regulatory support, financial incentives, and risk-sharing mechanisms. For instance, in Singapore, PPP contracts for WtE plants offer long-term stability, while in Vietnam, feed-in tariffs and EPR regulations encourage private investment in recycling and energy recovery. The private sector also has their own internal motivation as they believe businesses that

offer environmentally friendly practices are often accepted by the community. However, challenges persist. Projects like Jakarta's RDF facility show how delays and unclear contract enforcement can jeopardize PPP success²⁰. In community-based cases like Bali's Gianyar or Philippines' UCLA, impact is often limited by local capacity, lack of financing, or weak market links.

Tourism-sector waste initiatives have also demonstrated potential, particularly when supported by private leadership (e.g. Potato Head's Community Waste Project) or NGO-business collaboration (e.g. Sungai Watch). Yet most operate outside formal government partnerships and lack integration into broader municipal systems. Scalability remains a concern where efforts are fragmented, informal, or dependent on voluntary participation.

The experiences outlined in this chapter suggest that enabling private sector involvement requires not only strong legal and institutional frameworks but also coordinated financial, regulatory, and behavioral incentives. Clear mandates, performance-linked instruments, empowered local authorities, and inclusive consultation processes consistently appear as key success factors across ASEAN.



20. <https://en.antaranews.com/news/389613/jakarta-governor-committed-to-solve-rorotan-rdf-odor-problem>

BUSINESS MODELS FOR PRIVATE SECTOR INVOLVEMENT

04



This chapter explores the business models and contracting mechanisms through which private sector actors are engaged in solid waste management. While Chapter 3 outlined the enabling policy and regulatory environment, this section focuses on how these collaborations are structured financially and operationally through instruments such as PPPs, concessions, blended finance, and circular economy models.

The chapter is divided into two parts: 4.1. Public-Private Partnerships (PPPs), which focus on traditional models involving structured risk-sharing and long-term agreements, and 4.2. Other Emerging Models, which highlight newer approaches such as blended finance, circular economy partnerships, and innovative concession schemes. Together, these business models offer practical pathways for governments, businesses, and communities to collaborate toward sustainable waste management outcomes.

4.1.

Public-Private Partnerships (PPP)

Public Private Partnerships (PPP) are structured collaborations where public authorities and private companies share risks, responsibilities, and rewards to deliver public services or infrastructure over the long term. In the waste management sector, PPPs cover models such as service contracts, concessions, Build-Operate-Transfer (BOT), and Design-Build-Operate-Transfer (DBOT) schemes. In addition, the EPR policy may also be considered and be implemented in such a way that it encompasses a PPP-type mechanism, e.g. for infrastructure development. These arrangements are distinguished by their emphasis on performance-based delivery, risk-sharing agreements, and clear public oversight, ensuring that essential services like waste collection, recycling, and energy recovery remain aligned with public interests while leveraging private sector efficiency and investment. This section focuses on common PPP models and their application in solid waste management across ASEAN countries.

4.1.1.

Standard PPP Models

In this model, the public sector collaborates with private companies to deliver waste management services. The partnership can cover various aspects such as waste collection, recycling, and waste-to-energy projects.



Source: <https://www.nowbali.co.id/> (Now Bali, 2024)

Description

In this model, the public sector collaborates with private companies to deliver waste management services. The partnership can cover various aspects such as waste collection, recycling, and waste-to-energy projects.

Advantages

- Leverages private sector efficiency and innovation.
- Shares financial and operational risks.
- Attracts significant investment and expertise.

Disadvantages

- Requires robust regulatory frameworks and oversight.
- Potential for conflicts of interest if not managed properly.

Success Factors

- Clear and supportive policies and regulations.
- Strong stakeholder engagement and transparent communication.
- Well-defined roles and responsibilities in the PPP agreement.

Case Study: Kuala Lumpur, Malaysia

The management of municipal solid waste in Kuala Lumpur was handled by Kuala Lumpur City Hall and it has been privatized to Alam Flora Company and other concessionaires in January 1997. The privatization of solid waste management is applied to control and manage the waste collection and disposal to proper and legal sanitary landfills. The concessionaire is also responsible to supply communal bins for public use, managing waste collection based on a schedule, using cost-effective and efficient waste management systems, and promoting public education on proper waste handling and storage²¹.



Source: <https://alamflora.com.my>

21. Osmi S.F.E., Mokhtar N., Romali N.S., Osmi S.K.C. (2013). Enhanced the Municipal Solid Waste Management in Kuala Lumpur by Implementing Technologies from European Countries: Strategies and Action Plans. International Journal of Civil Engineering and Geo-Environmental Journal, homepage:<http://ijceg.ump.edu.my>

The collaboration has led to improved waste services across Kuala Lumpur. While the private company Alam Flora provides operational expertise, investment in infrastructure (i.e. waste collection vehicles, recycling facilities, waste-to-energy plants) and innovative solutions, Kuala Lumpur City Hall provides the regulatory frameworks, monitors compliance, and facilitates public awareness.

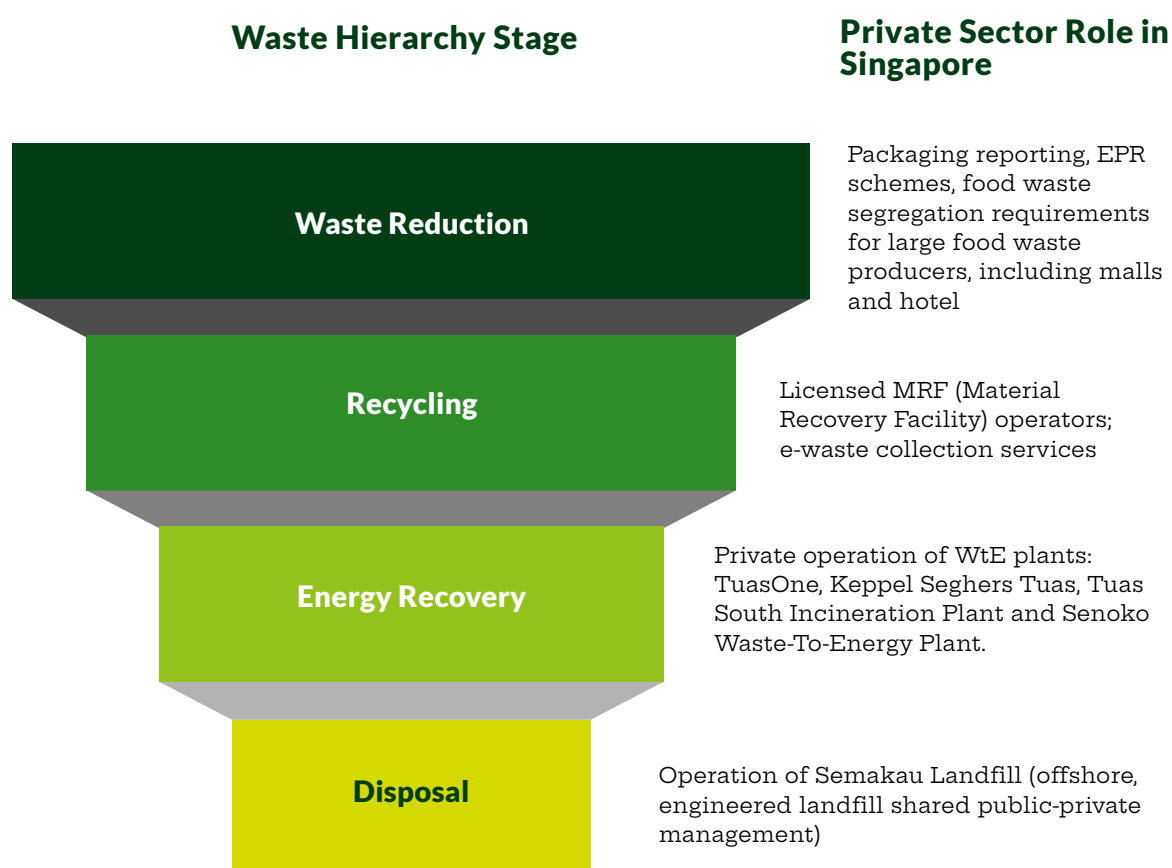
The estimated investment required is around \$50 million (based on general benchmarks for infrastructure development—publicly available sources do not specify the exact amount invested by Alam Flora Sdn Bhd in Kuala Lumpur) for a comprehensive waste management system with average return on investment (ROI): 10-15% over 10 years.



Source: <https://themalaysianreserve.com>

Case Study: Singapore Full Waste Lifecycle Management as a Platform for Private Sector Engagement

Singapore's Resource Sustainability Act (2019) supports the Zero Waste Masterplan (2019–2030) through regulatory measures. Public-private collaboration is integral to achieving its Zero Waste Masterplan targets, with strong implications not only for municipal waste but also for tourism-related cleanliness and sustainability. This successful regulatory framework adopts an integrated approach to cover prevention, reuse, recycling, and responsible disposal.



Singapore's experience illustrates that full lifecycle integration, supported by clear regulations, financial incentives, and risk-sharing PPP models, provides fertile ground for private sector participation across both municipal and tourism sectors.

4.1.2.

Institutionalized-PPP

This section examines cases from ASEAN countries where private sector participation in waste management has been implemented on a large scale, supported by strong national policy frameworks. These approaches are characterized by the presence of clear legal and institutional structures, industrial scale solutions such as WtE and ideally clearly defined roles. In some cases, engagement has evolved into institutionalized public-private partnerships (PPP) leading to the establishment of joint ventures or special purpose partnerships, enabling long-term cooperation and joint investments and more resilient service delivery systems.

Singapore

Singapore is renowned for its comprehensive and integrated waste management system. The country employs a combination of WtE incineration, recycling, and landfill management to handle its solid waste. With its limited land and dense urban population, Singapore took a bold step in 1970s by investing SGD \$100 million in WtE incinerator technology in their first WtE plant. Through WtE, waste volume in Singapore is reduced by 90%. Today, Singapore has 4 WtE plants: TuasOne (TWTE), Keppel Seghers Tuas (KSTP), Tuas South Incineration Plant (TSIP), and Senoko (SWTE). Those WtE plants were developed under different models involving private sector participation, e.g. KSTP and TWTE were both developed under Design, Build, Own, and Operate (DBOO) models. KSTP began operations in 2009, replacing the Ulu Pandan WTE plant, while TWTE was commissioned in 2021, succeeding the Tuas Incineration Plant. The Senoko Incineration Plant was transferred to private sector ownership in 2009 and has since operated as SWTE. The Integrated Waste Management Facilities (IWMF) called Tuas Nexus is a combination facility of a WtE facility, a material recovery facility, a food waste treatment and the sludge incineration plant. Singapore's NEA awarded the Engineering, Procurement and Construction (EPC2) contract to

a joint venture between UES Holdings (Singapore) and China Harbour Engineering Company. Within this cooperation framework, the joint venture engaged the Canadian company Anaergia Inc. to design and supply technologies for a 400-tonne-per-day food waste treatment facility. Once it is completed, it will be owned and operated by NEA²³.

Vietnam

Private sector participation in Vietnam's municipal waste management has expanded significantly, supported by national policy reforms (e.g. Decree 31/2024). WtE plants such as the Soc Son Plant in Hanoi, have been developed under BOT contract, and has begun private operation by Thien Y Environmental Energy JSC in July 2022. It processes 4,000–5,000 tons of waste daily (equivalent to 70% of Hanoi total municipal solid waste) and generates up to 90 MW of electricity.

In the recycling sector, Vietnam's EPR framework has pushed companies like Coca-Cola, Tetra Pak, and Saigon Co.op to partner with local authorities in installing reverse vending machines, running recycling awareness campaigns, and providing consumer incentives such as plastic-for-voucher exchanges. The "Green and Clean" program in Da Nang, involving local communities in waste segregation, recycling, and composting activities, complements these larger-scale private sector initiatives. This program has not only improved waste management but also raised public awareness about environmental protection²⁴. The initiative has led to a reduction in waste sent to landfills and increased recycling rates. Together, they reflect Vietnam's blended approach of community participation and industrial innovation, with the private sector playing a pivotal role in infrastructure development.

23. <https://www.nea.gov.sg/our-services/waste-management/waste-management-infrastructure/solid-waste-management-infrastructure>

24. Noudeng V., Pheakdey D.V., Minh T.T.N., and Xuan T.D. 2024. Municipal Solid Waste Management in Laos: Comparative Analysis of Environmental Impact, Practices, and Technologies with ASEAN Regions and Japan. *Environments* 2024, 11(8), 170; <https://doi.org/10.3390/environments11080170>

4.1.3.

Concession Models

The concession model is a form of PPP in which a private company is granted the right to operate and manage waste management services for a defined period. The concessionaire is responsible for the design, construction, financing, operation, and maintenance of waste management facilities, such as landfills, recycling centers, and WtE plants.

Description

The concession model is a form of PPP in which a private company is granted the right to operate and manage waste management services for a defined period. The concessionaire is responsible for the design, construction, financing, operation, and maintenance of waste management facilities, such as landfills, recycling centers, and waste-to-energy plants.

Key Elements of the Concession Model

- **Concession Agreement:** A formal contract between the government and the private company that outlines the terms and conditions of the concession, including the scope of services, performance standards, and financial arrangements.
- **Service Provision:** The private company is responsible for providing waste management services, including waste collection, transportation, and disposal. Depending on the terms of the agreement, the company may also implement recycling programs or operate waste-to-energy (WTE) facilities to extract value from waste streams.
- **Government Oversight:** The government sets the regulatory framework, monitors compliance, and ensures that the private company meets the required standards. The government also provides strategic direction to align waste management practices with broader environmental and public health goals.

Key Elements

The private company invests in infrastructure, equipment, and operational expenses. The return on investment (ROI) comes from fees paid by the government for the services provided, as well as potential revenue from recycling and waste-to-energy projects.

Benefits

- Long-term investment commitment: Because concessionaires invest significant capital upfront, they have a strong incentive to maintain high operational standards over the contract period.
- Clearer performance accountability: Performance is tied to contract deliverables, allowing governments to enforce quality standards more easily compared to fragmented service contracts.
- Service continuity and scaling: Concession models often include provisions for scaling up services (e.g., expanding collection coverage, introducing recycling activities) without renegotiating the entire contract.

Advantages

- Can improve service quality and efficiency.
- Utilizes private sector expertise in service delivery.

Disadvantages

- Requires strong regulatory oversight to prevent monopolistic practices.
- Potential for public resistance if not properly communicated.

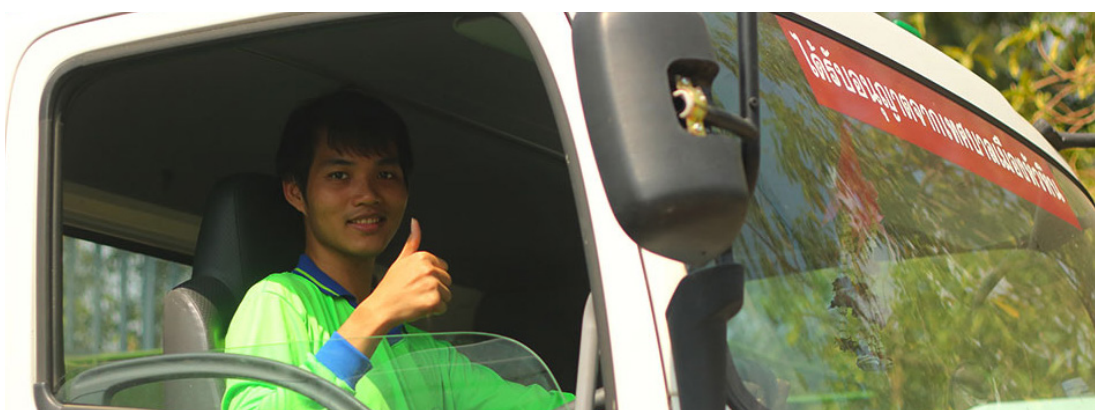
Success Factors

- Transparent bidding and selection process.
- Comprehensive regulatory framework.
- Continuous performance monitoring and public reporting.

Case Study: Bangkok, Thailand

Bangkok, the capital city of Thailand, faces significant challenges in managing its municipal solid waste due to rapid urbanization and population growth. To address these issues, the Bangkok Metropolitan Administration (BMA) has implemented a concession model for municipal solid waste management, involving a Public-Private Partnership (PPP) with private companies.

One of the key companies involved is Muang Sa Ad Co., Ltd. They have been providing environmental management services, including waste collection and transportation, landfill management, and resource recovery of recyclable materials and renewable energy, since 1999.



Source: <http://www.msa.co.th/en/products-services.html>

Role of Private Actor and Government

Private Actor:

Muang Sa Ad Co., Ltd is responsible for the day-to-day operations of waste management, including the collection, transportation, and disposal of municipal solid waste. They bring in the necessary capital, technology, and expertise to improve the efficiency and effectiveness of waste management services.

Government:

The Bangkok Metropolitan Administration (BMA) plays a crucial role in setting the regulatory framework, monitoring compliance, and ensuring that the private company meets the required standards. The government also provides strategic direction and oversight to ensure that waste management practices align with broader environmental and public health goals.



Source: <http://www.msa.co.th/en/products-services.html>

Investment Costs and Return on Investment

The investment costs for implementing the Concession Model can vary depending on the scale and scope of the project. These costs typically include capital expenditures for infrastructure development, equipment procurement, and operational expenses. The private company may also incur costs related to technology implementation and workforce training.

Key Outcomes

- **Improved Waste Management:** The Concession Model has enhanced the efficiency and effectiveness of waste management services in Bangkok. This has led to a reduction in the volume of waste sent to landfills and an increase in recycling rates.
- **Environmental Benefits:** The model has contributed to a reduction in greenhouse gas emissions and other environmental pollutants, promoting a cleaner and healthier environment.
- **Economic Benefits:** The involvement of the private sector has created new business opportunities and jobs, contributing to local economic development.

Source:

<http://www.msa.co.th/en/about-us.html?formCode=MG0AV3>

Luanratana W., Visvanathan C. (2006) Sustainable Waste Management: A Case Study of the Bangkok Metropolitan Authority. Sustainable Development Policy and Administration. Edition 1st Edition, Routledge.

Siriratpiriya, O. (2014). Municipal Solid Waste Management in Thailand: Challenges and Strategic Solution. In: Pariatamby, A., Tanaka, M. (eds) Municipal Solid Waste Management in Asia and the Pacific Islands. Environmental Science and Engineering. Springer, Singapore. https://doi.org/10.1007/978-981-4451-73-4_17

4.1.4.

Design-Build-Operate-Transfer (DBOT) Models and Variations

BOT is a public-private partnership model where a private company is granted the rights to finance, design, build, and operate a project for a specified period.

Description

BOT is a public-private partnership model where a private company is granted the rights to finance, design, build, and operate a project for a specified period. After this period, ownership and operational responsibilities are transferred back to the public sector. Below is a brief overview of how BOT works.

- **Build:** A private company designs and constructs a waste management facility, such as a landfill, recycling plant, or waste-to-energy (WTE) plant.
- **Operate:** The private company operates and maintains the facility for a specified period, ensuring it functions efficiently and meets regulatory standards.
- **Transfer:** Upon the expiration of the contract, the ownership and operation of the facility are transferred back to the public sector.

This model enables municipalities to benefit from the expertise and efficiency of private companies while sharing the financial risks and responsibilities. It can lead to improved waste management services and infrastructure without requiring the municipality to bear the full cost of construction and operation.

Advantages

- **Efficient Resource Utilization:** Private contribute expertise, technology, and efficient management practices, leading to improved efficiency and outcomes.
- **Risk Sharing:** Financial and operational risks are distributed between public and private partners, reducing the burden on government budgets.
- **Innovation:** Private companies often brings in innovative solutions and advanced technologies that improve waste management outcomes.
- **Faster Project Completion:** The involvement of private companies can expedite project completion due to their experience and resources.
- **Revenue Generation:** The private company can generate revenue during the operation phase, which can be reinvested into the project.

Disadvantages

- **Complex Contractual Agreements:** Drafting and negotiating BOT contracts can be complex and time-consuming.
- **Financial Risks:** Private companies bear significant financial risks, particularly if the project does not generate expected revenue.
- **Public Accountability:** Ensuring transparency and accountability can be challenging, as private companies may prioritize profit over public interest.
- **Long-Term Commitment:** The public sector must commit to a long-term partnership, which may limit flexibility in decision-making.

Success Factors

- **Clear Contractual Agreements:** Well-defined roles, responsibilities, and performance standards are crucial.
- **Stakeholder Engagement:** Continuous engagement with all stakeholders, including local governments and communities, ensures transparency and cooperation.
- **Technical Expertise:** Leveraging the technical expertise of private companies can lead to innovative solutions and efficient operations.
- **Environmental and Social Safeguards:** Implementing safeguards to minimize negative impacts on the environment and local communities is essential.
- **Capacity Building:** Training and capacity building for local government staff and community members are vital for long-term sustainability.

Case Study: the Philippines - The Municipality of Malay Ecological Solid Waste Management Project

Background

The municipality of Malay, home to the internationally renowned tourist destination **Boracay Island**, faces significant challenges in managing its solid waste. With the steady influx of tourists and the rising number of business establishments and households in Boracay, the number of solid wastes generated has rapidly increased, becoming one of the most pressing environmental issues on the island.

In compliance with Republic Act 9003, the Municipality of Malay constructed a sanitary landfill in Barangay Kabulihan to protect the environment from pollution caused by littering and improper disposal of waste, through the promotion of proper waste management practices.

Boracay Island's Waste Contribution in 2018

78.06
tons /day

Malay mainland

5.9
tons /day

In total

84.02
tons /day for the entire municipality

Cause and Effect

According to the municipality of 10-Year Ecological Solid Waste Management Plan and the Kabulihan Sanitary Landfill-Environmental Performance Report and Management Plan (SLF EPRMP), total waste generation in Boracay Island is projected to decline from 78.06 tons/day in 2018 to 65.71 tons/day in 2027, while waste from Mainland Malay is expected to increase from 5.9 to 42.0 tons/day. This projection was under the assumption that Boracay implement stricter policy to tourism sector, while substantially improve waste reduction, recycling and recovery, whereas Mainland Malay is projected to experience population growth, economic expansion, and wider waste collection coverage, leading to higher recorded waste generation. **If not properly handled this will threaten the tourism industry, not only of the province but of the country²⁵.**

Project Background

The project involves the hauling of solid waste and the management and operation of a landfill located at Barangay Kabulihan, Malay, Aklan. The landfill is owned by the Department of Environment and Natural Resources (DENR).

25. LGU of Malay. (2021). Environmental Performance Report and Management Plan of Kabulihan Sanitary Landfill. LGU of Malay: Aklan.

The Primary Issues

- **Inadequate Waste Collection and Disposal:** The existing waste management infrastructure is insufficient to handle the growing volume of waste generated by the community.
- **Environmental Pollution:** Improper waste disposal practices lead to environmental pollution, affecting soil, water, and air quality.
- **Health Risks:** Poor waste management poses health risks to residents, including the spread of diseases and exposure to hazardous materials.

Build-Operate-Transfer (BOT) Scheme

The project follows a Build-Operate-Transfer (BOT) model, which includes three phases

- **Build:** The private proponent, ECOS Sanitary Landfill, is responsible for the design and construction of the landfill facility.
- **Operate:** ECOS Sanitary Landfill will operate and maintain the landfill for a specified period, ensuring it functions efficiently and meets regulatory standards.
- **Transfer:** After the agreed-upon period, the ownership and operation of the landfill will be transferred back to the Municipal Government of Malay.

Investment and Financials

Estimated project cost

₱ **247.68**
million

The project's contract term

15
years

The investment will be funded through a combination of debt and equity.

Key Partners

- **Municipal Government of Malay:** The implementing agency responsible for overseeing the project.
- **ECOS Sanitary Landfill:** The private proponent responsible for the design, construction, and operation of the landfill facility.
- **Department of Environment and Natural Resources (DENR):** The owner of the landfill.

Sources: Local Government Unit of Malay (2021). Aklan Environmental Performance Report and Management Plan Kabulihan Sanitary Landfill. Barangay Kabulihan, Municipality of Malay, Province of Aklan.

In a DBOT partnership in municipal solid waste management the private company is responsible for the entire lifecycle of a waste management project, from design and construction to operation and eventual transfer back to the government.

Design-Build-Operate-Own-Transfer (DBOOT) differs by allowing the private partner to not only operate but also own the asset during the concession period, enhancing investment security and control.

This model is particularly suited to capital-intensive projects like waste-to-energy facilities, where long-term operational certainty is needed to justify high upfront investments. However, DBOOT requires strong contractual safeguards to ensure asset quality at transfer, regulatory oversight throughout operations, and mechanisms for aligning private ownership interests with public sustainability goals.

Key Elements of the DBOT Model

In DBOT model the private company is responsible for the entire lifecycle of a waste management project, from design and construction to operation and eventual transfer back, e.g. to the public sector.

- **Design:** The private company designs the waste management facility, including planning and engineering.
- **Build:** The private company constructs the facility according to the design specifications.
- **Operate:** The private company operates and maintains the facility, providing waste management services such as collection, transportation, and disposal.
- **Transfer:** After a specified period, the ownership and operation of the facility are transferred back to the government.

Benefits

- **Efficiency:** The private company brings expertise and efficiency to the project, ensuring high-quality construction and operation.
- **Innovation:** The private sector can introduce new technologies and innovative practices to improve waste management.
- **Risk Management:** The private company assumes the risks associated with the design, construction, and operation of the facility, reducing the burden on the government.
- **Cost Savings:** The competitive bidding process can lead to cost savings for the government.

Advantages

- Encourages private investment in infrastructure development.
- Brings in private sector operational expertise.

Disadvantages

- Long-term contracts can be complex and require careful negotiation.
- Public sector may face challenges in managing the transition phase.

Success Factors

- Detailed feasibility studies and risk assessments.
- Clear contractual terms and conditions.
- Effective monitoring and evaluation mechanisms.

Case Study: Singapore Waste-to-Energy Plant

The TuasOne Waste to Energy Plant is Singapore's sixth and most advanced waste-to-energy facility. It is designed to incinerate 3,600 tonnes of waste daily and generate 120 megawatts of electricity daily, which is enough to power about 240,000 four-room Housing Board flats. The plant commenced operations in December 2021 and is known for its land efficiency, occupying just 4.8 hectares of land.

The TuasOne plant was developed under the Public-Private-Partnership (PPP) framework using the Design-Build-Own-Operate (DBOO) model: The private partner (Mitsubishi Heavy Industries Environmental & Chemical Engineering ECO Creation Singapore) was responsible for designing, constructing, operating, and maintaining the plant before transferring operational responsibility back to the government after a specified concession period.



Source: <https://www.nea.gov.sg/media/news/news/index/tuasone---the-latest-and-most-land-efficient-waste-to-energy-plant-in-singapore>

Role of Private Actor and Government

Private Actor:

The private sector partner brings in the necessary capital, technical expertise, and operational efficiency. They are responsible for the design, construction, and operation of the plant, ensuring it meets the required standards and performance metrics.

Government:

The government, through the National Environment Agency (NEA), provides the regulatory framework, oversight, and support. They ensure that the project aligns with national waste management goals and environmental standards.



Source: <https://www.nea.gov.sg/media/news/news/index/tuasone---the-latest-and-most-land-efficient-waste-to-energy-plant-in-singapore>



Source: <https://www.nea.gov.sg/media/news/news/index/tuasone---the-latest-and-most-land-efficient-waste-to-energy-plant-in-singapore>

Investment Costs and Return on Investment

The total investment for the TuasOne Waste to Energy Plant is approximately \$750 million (\$545.2 million). The project financing includes a \$653 million (\$474.7 million) 27-year loan facility which will be used to finance the development, construction, and start-up costs of the plant. The private sector partner, Mitsubishi Heavy Industries, and Hyflux, jointly established TuasOne Pte Ltd to manage the project. The return on investment (ROI) for the project comes from the sale of electricity generated by the plant.

By generating 120 megawatts of electricity daily, the plant contributes to the national grid and provides a steady revenue stream over the operational period. Additionally, the project enhances the private sector's reputation for corporate social responsibility (CSR) and sustainability, which can have long-term benefits for the companies involved.

Sources:

<https://www.nea.gov.sg/media/news/news/index/tuasone---the-latest-and-most-land-efficient-waste-to-energy-plant-in-singapore?formCode=MG0AV3>

<https://ippjournal.com/news/financial-close-reached-for-a-waste-to-energy-plant-in-singapore?formCode=MG0AV3>

<https://www.mhi.com/news/22080801.html?formCode=MG0AV3>

In the case of EPR, encouraging collaboration between governments, producers, and Producer Responsibility Organizations (PROs) during the design phase of EPR can help ensure that targets are realistic, implementation mechanisms are practical, and governance structures are transparent and accountable. During the implementation phase, EPR systems tend to be most effective when operational responsibilities are led by producers and PROs, while government oversight focuses on strategic policy alignment, coordination, and compliance monitoring.

4.2.

Other Innovative Financing Models

While PPPs focus on structuring the relationship between public and private sectors, innovative financial mechanisms aim to mobilize capital and de-risk investments to support sustainable waste management initiatives. Tools such as blended finance models, green bonds, and sustainability-linked loans provide critical funding but do not, by themselves, define a public-private service partnership. Instead, they complement PPP structures or stand alone to incentivize private sector innovation, investment, and accountability in waste management projects. This section explores these financing models and how they can support the expansion and scalability of private sector-led waste solutions across ASEAN.

Blended Finance Model

Blended financing involves public funds, grants, or soft loans combined with private capital to reduce the investment risk in sustainable waste management projects. The government or development bank provides initial funding or

guarantees to attract private investors. Private partners gain access to low-interest loans or equity financing for SWM infrastructure projects (e.g., Waste-to-Energy plants). For example, the ASEAN Catalytic Green Finance Facility (ACGF) and Indonesia's SDG Indonesia One platform blends public, grant, and private funds to finance green infrastructure, including waste management.

Green Bonds and Sustainability-Linked Loans

Green bonds and sustainability-linked loans are innovative financial instruments that support environmentally responsible investments. Green bonds are issued to finance specific waste management projects such as recycling facilities or composting plants. Sustainability-linked loans tie interest rates to performance targets such as waste diversion or emissions reductions. Governments can incentivize banks and municipalities to issue municipal green bonds for solid waste management projects by offering tax benefits to investors. For instance, Thailand has issued green bonds to finance urban sustainability projects, including upgrades to solid waste management infrastructure.

Impact Investing and ESG-Driven Private Sector Participation

Impact investors are increasingly funding waste management projects that provide measurable social and environmental benefits in addition to financial returns. Investors provide equity or loans to SWM businesses that contribute to environmental goals (e.g., circular economy models). Projects with strong ESG performance attract more funding from international and regional investors. Creating impact funds that specifically target SWM projects, with measurable ESG outcomes linked to investment returns is advised. For example, global companies in ASEAN are increasingly investing in plastic recycling and zero-waste initiatives as part of their ESG goals.



05

TECHNOLOGY AND INNOVATION
TO ENABLE PRIVATE SECTOR
INVOLVEMENT IN WASTE
MANAGEMENT

Following the discussion on business models in Chapter 4, this chapter explores how technology and innovation can act as critical enablers to scale up private sector involvement in municipal and tourism waste management sectors. While regulatory frameworks and financial incentives create the necessary environment, innovation transforms what is possible by making waste management more efficient, investable, and performance-driven. Technological advancements not only attract new types of private actors (e.g., tech-startups, circular economy ventures) but also create new revenue models, improve operational efficiencies, and offer solutions to persistent challenges such as waste segregation, tracking, and recycling.

5.1.

Digital Platforms and Smart Tools

Digital Platforms and Technology-Based Models

Digitalization creates new business opportunities for private actors by enabling performance-based services, pay-per-use pricing, and ESG-aligned value chains. Digital platforms track waste flows, optimize collection and recycling routes, and generate real-time data to inform decision-making. These tools also support contractual compliance, fraud prevention, and impact verification, which are key for public-private partnerships (PPPs) and Extended Producer Responsibility (EPR) systems. Several companies in Indonesia are using Internet-of-Things (IoT)-based smart bins and blockchain platforms, and mobile apps to increase transparency and accountability in waste collection.



Smart Waste Bin

To improve sorting behavior at the source and reduce contamination of recyclables, smart waste bins are equipped with AI-powered object recognition to automatically separate waste into appropriate categories. This addresses a key behavioral barrier where many users feel unsure or unmotivated to sort waste correctly, which leads to low-quality recycling streams. For instance, Singapore's Agency for Science, Technology, and Research (A*STAR) and a consortium of businesses have unveiled BINgo, a smart bin which uses artificial intelligence (AI), the Internet of Things (IoT), and smart sensors to detect, recognize, and sort waste items while collecting data on user behavior. For private sector actors, these bins reduce labor costs in manual sorting, improve the quality and value of recovered materials, and generate reliable user data that can feed into loyalty, pay-per-use, or rewards systems. The smart bin model also opens avenues for private companies to enter service contracts, lease bin infrastructure, or develop analytics platforms linked to recycling behavior.



Recycling Apps

Apps like E-Recycle, Rapel and Octopus allow users to exchange recyclable waste for cash or points that can be redeemed as vouchers or transferred to an e-wallet. For example, Waste4Change operates in 10 cities across Indonesia using the E-Recycle app in Jakarta; the Rapel app in Yogyakarta and Central Java; and the Kepul app in Medan, North Sumatera'. These platforms create micro-scale recycling economies, attract fintech startups, and allow private recyclers to source materials directly from consumers or informal collectors. Revenue can be generated through transaction fees, carbon credits, advertising, or partnerships with e-commerce and retail platforms.

Technology can play a transformative role in addressing waste management challenges

in ASEAN by improving waste forecasting, optimizing collection, and enhancing resource allocation. Encouraging private sector participation in regional pilot projects that apply AI and blockchain technologies could demonstrate more efficient waste collection and recycling.

Meanwhile, digitalization offers business opportunities for private sector engagement by enabling clearer paths to profitability, lowering operating costs and risks, and creating opportunities for new and innovative market entrants.

5.2.

Tech-Enabled Recovery and Source Segregation

Incentive-based technologies aim to increase participation in waste segregation by aligning user behavior with measurable benefits. These tools make it possible to introduce innovative pricing models, feedback loops, and gamification for households and businesses.

▪ **Reverse Vending Machines:**

Singapore – In Singapore, starting April 2025, a 10-cent refundable deposit will apply to all pre-packaged beverage containers in plastic bottles and metal cans (150 ml–3 L) under a joint initiative by the National Environment Agency (NEA) and F&N Foods. Consumers can reclaim the deposit by returning empties at reverse vending machines (RVMs). Each container will feature a deposit mark and barcode for identification and fraud prevention. In Indonesia, PT ASDP Indonesia, a state-owned company on sea transportation, installed through its CSR program 4 RVMs in greater Jakarta and Merak. RVMs allow private operators to establish reverse logistics networks while collecting clean, high-value recyclables. They can be linked to loyalty apps,

advertising screens, or refill stations, enabling circular economy business models. RVM deployment also supports EPR compliance, allowing brand owners or PROs (Producer Responsibility Organizations) to contract private RVM service providers.

▪ **Digital weighing systems, RFID tags, and mobile payment:**

These tools enable accurate measurement of waste at the household or business level. They are foundational to “Pay-As-You-Throw” (PAYT) schemes, where users are charged based on volume or weight, shifting the cost and incentive structure toward waste reduction. When integrated into smart bins or apps, they allow private tech providers to offer scalable, data-driven services for source segregation and collection. This opens up revenue models based on subscriptions, data monetization, or tiered service offerings, and allows governments to contract private operators under performance-based payment terms.

Emerging technologies improve the commercial viability of private sector participation by supporting new service models, improving quality of recyclables, and enabling secure, data-driven collaboration

5.3.

Monitoring, Data, and Traceability

Robust data systems are essential for ensuring accountability in waste management initiatives. They also enhance transparency and traceability, which are increasingly important for ESG investors, EPR systems, and carbon credit mechanisms.

- **Digital Tracking Systems:**

In Malaysia, GeoFlora by Alam Flora offers real-time landfill monitoring, allowing municipalities to supervise private contractor performance remotely. This improves enforcement, builds trust in outsourcing models, and enables incentive-based payments based on verified results.

- **Blockchain/QR-Tagged Credits:**

Vietnam is piloting traceable EPR credits using blockchain and QR tags to verify the origin and processing of recycled materials. Such systems allow private companies including waste aggregators, brand owners, and financial firms to trade and verify EPR compliance or environmental credits in transparent marketplaces. This unlocks investment, reduces fraud, and enables measurable impact reporting.

Monitoring and data systems encourage private sector engagement by building a trustworthy, financially viable environment for investment and operations. They can reduce partnership risks and generate verifiable financial assets, making the waste management sector more appealing to a broader range of companies.

As this chapter shows, technology is not just an operational tool, but a catalyst for new business models, behavior change, and investor confidence. The following chapter outlines how governments and stakeholders can integrate these innovations into real-world partnerships.



Source: <https://www.istockphoto.com> (Istock franz12, 2017)

PRACTICAL GUIDANCE FOR STAKEHOLDERS

06



This final chapter provides a practical roadmap for governments, communities, and other project leaders to engage the private sector effectively in solid waste management, particularly in municipal and tourism sectors. The guidance builds on the experiences outlined in the preceding chapters and incorporates expert inputs from private sector stakeholders.

It consolidates the enabling environment (Chapter 3), the business models (Chapter 4),

and the role of innovation (Chapter 5) into concrete steps for action.

The guidance is structured into the main stages: preparation, pitching, post-pitch management, long-term communication and stakeholder support and monitoring and evaluation. The following graphic provides an overview on the key elements which are outlined in detailed in the following chapters.

Practical Guidance for Stakeholders

A roadmap for governments, communities, and project leaders



Stage One: Preparation



Needs Assessment and Feasibility Study

Analyze waste generation rates, collection coverage, recycling rates, and disposal methods. Evaluate financial, technical, and operational aspects of potential projects.



Stakeholder Consultation and Engagement

Engaging local communities, NGOs, and other stakeholders in the planning and implementation of SWM projects can enhance transparency and accountability.



Market Analysis

- Identify existing private companies and analyze their overall capabilities
- Issue a Request for Information (RFI) for potential private sector partners
- Develop pre-qualification criteria to shortlist potential partners
- Identify best PPP models in other regions/countries to use as benchmark



Define Project Scope and Objectives

Clearly define the scope of the PPP project & set measurable objectives.



Develop a Preliminary Business Case

Prepare a preliminary business case that outlines the value proposition for the private sector and submit it to grant approval from relevant authorities.



Prepare Draft Partnership Framework

Develop a draft PPP agreement that is clear, transparent, and legally sound, outlining the roles, responsibilities, performance expectations, and risk-sharing mechanisms between the public and private sectors.



Stage Two: Pitching

Pitching for private sector involvement in solid waste management aims to secure:



financial investment



partnerships



support from the private sector

to improve waste management practices in municipalities and the tourism sector.

Keys to a Successful Pitch:

01

Clearly define the waste management challenges & highlight the environmental, social, and economic impacts of the current practices.

02

Present the financial benefits for the private sector:



recycling revenues



energy sales



CSR opportunities

03

Present the financial structure, payment mechanisms, risk-sharing terms, and government support.

04

Share examples of similar successful private sector involvement in waste management projects (locally and internationally).

05

Hold a stakeholder alignment.

06

Outline a follow-up plan to maintain communication and collaboration.

07

Use clear, concise, and persuasive language in the pitch.

Stage Three: Post-Pitch Mobilization



After a successful pitch, attention must shift to managing post-pitch engagement to keep the momentum, to deepen partner interest, and to lead negotiation carefully.

Key Actions:



Sustaining the Partnership

Sustained private sector investment depends on:



Contracts



Broad-based
community
support



Long-term stakeholder
mobilization

Strategies for Long-Term Support



Public Awareness Campaigns

Conduct public awareness campaigns to inform the community about the benefits of the PPP and how it will improve waste management services.



Transparent Communication

Regularly disclose project progress, environmental performance, and community benefits.



Feedback Mechanism

Create accessible channels (hotlines, town halls) for citizens to raise any concerns or suggestions.



Inclusive Participation

Partner with universities, NGOs, and informal sector organizations to design and monitor waste initiatives, ensuring local buy-in.



Capacity Building for the Local Governments

Offer training programs and technical assistance for public officials and project teams to build expertise in PPP management, private sector involvement, advanced technologies, best practices, and regulatory compliance.

6.1.

Preparation for Private sector involvement

Private sector involvement requires careful preparation, understanding of market needs, and building readiness among all stakeholders. This section outlines the key stages of preparation for successful collaboration with private actors in solid waste management across municipal and tourism sectors.



01 Needs Assessment and Feasibility Study

▪ Conduct a Needs Assessment

Evaluate the current waste management system to identify gaps and inefficiencies. This includes analyzing waste generation rates, collection coverage, recycling rates, and disposal methods.

▪ Feasibility Study

Assess the feasibility of involving the private sector in SWM. This involves evaluating the financial, technical, and operational aspects of potential PPP projects. Consider factors such as cost-benefit analysis, potential risks, and expected outcomes.

02 Stakeholder Consultation and Engagement

▪ Identify and Engage Key Stakeholders

Engage with all relevant stakeholders, including local government authorities, community groups, environmental NGOs, and potential private sector partners. Engaging local communities, NGOs, and other stakeholders in the planning and implementation of SWM projects can enhance transparency and accountability.

▪ Conduct Consultations

Hold consultations to gather input and build consensus on the need for private sector involvement, identify community concerns, and incorporate local knowledge into the project design. This helps in understanding stakeholder concerns and expectations.

03 Market Analysis

▪ Analyze the Private Sector Landscape

Identify existing private companies, their capabilities, their interest in participating in PPP projects, and prior experience in similar projects.

- Request for Information (RFI): Issue an RFI to gather information from potential private sector partners. This helps in understanding their capabilities, interest, and suggestions for the project.
- Pre-Qualification: Develop pre-qualification criteria to shortlist potential private sector partners based on their technical expertise, financial stability, and experience in similar projects.

▪ Benchmarking

Compare successful PPP models in other regions or countries to identify best practices and refine partnership models.

Identifying Potential Private Sector Partners



Industry Expertise

Look for companies with experience in waste management, recycling, or environmental services.



Financial Stability

Ensure potential partners have the financial capacity to invest in the project.



Reputation and Track Record

Consider companies with a strong reputation and successful track record in similar projects.



Alignment with Goals

Choose partners whose corporate values and goals align with the project's objectives.

Source: DESMA Center, 2024. Compilation from various sources.

04 Define Project Scope and Objectives

▪ **Project Scope**

Clearly define the scope of the PPP project, including the specific services to be provided by the private sector (e.g., waste collection, recycling, waste-to-energy).

▪ **Set Measurable Objectives**

Establish clear objectives for the PPP, such as improving collection rates, increasing recycling rates, or reducing landfill use.

05 Develop a Preliminary Business Case

▪ **Draft a Business Case**

Prepare a preliminary business case that outlines the value proposition for the private sector: market potential, expected returns, partnership structure, and risk mitigation. Include financial projections and funding requirements.

▪ **Approval Process**

Submit the business case for approval by relevant authorities to proceed with the next stages of the private sector involvement in SWM.

06 Prepare Draft Partnership Framework

▪ **Draft PPP Agreement**

Develop a draft PPP agreement that outlines the roles, responsibilities, performance expectations, and risk-sharing mechanisms between the public and private sectors. Ensure that the agreement is clear, transparent, and legally sound.

▪ **Regulatory Compliance**

Ensure that the PPP framework complies with local regulations and policies. This includes obtaining necessary approvals and permits.



Source: <https://theaseanpost.com/> (The ASEAN Post, 2018)

6.2.

Pitching and Attracting Private Sector Partners

Why Pitching Matters

After thorough preparation, the next step is to effectively pitch the opportunity to private sector actors. Pitching in the context of private sector involvement in solid waste management refers to the process of presenting a proposal or plan to private companies, investors, or stakeholders, outlining the potential benefits, strategies, and expected outcomes of their participation in waste management projects. This pitch aims to raise interest and build confidence among potential partners by demonstrating the project's viability, relevance, and mutual benefits. This can then lay the groundwork for future collaboration, which may later include financial investment, technical partnerships, or other forms of private sector engagement.

Keys to a Successful Pitch

■ Clear Problem Statement

Clearly define the waste management challenges, such as low recycling rates, landfill overcapacity, or tourism-driven waste surges, and the need for private sector involvement. Highlight the environmental, social, and economic impacts of the current waste management practices.

■ Compelling Value Proposition

Present a strong value proposition that outlines the financial benefits for the private sector through service contracts, recycling revenues, energy sales, or carbon credits. In addition, non-financial benefits such as positive brand image and corporate social responsibility (CSR) opportunities.

■ Detailed Business Model

Present the financial structure, payment mechanisms, risk-sharing terms, and government support (e.g., subsidies, tax incentives, revenue guarantees). Connect it to the goal in solving the waste management

challenges with a detailed plan of implementation strategies, timelines, and expected outcomes.

■ Evidence of Success

Share case studies or examples of similar successful private sector involvement in waste management projects, both locally and internationally, to demonstrate feasibility and potential success.

■ Stakeholder Alignment

Demonstrate that the project is backed by community consultation, regulatory approvals, and local government support.

■ Follow-Up Plan

Outline a follow-up plan to maintain communication and collaboration with the private sector, ensuring ongoing support and partnership.

■ Clear Communication

Use clear, concise, and persuasive language in the pitch. Visual aids, such as charts, graphs, and infographics, can help convey complex information effectively.

Key Components to Prepare for Pitching



Executive Summary

A concise overview of the project, including objectives, benefits, and financial highlights.



Detailed Proposal

Comprehensive documentation covering all aspects of the project.



Financial Plan

Detailed cost estimates, funding requirements, and projected returns.



Regulatory Compliance

Documentation of all necessary permits and approvals.



Stakeholder Analysis

Identification and roles of key stakeholders.

Source: DESMA Center, 2024. Compilation from various sources.

Please use the checklist for actions in Annex to carry out the pitching process.

6.3.

Managing Post-Pitch Engagement and Negotiations

After a successful pitch, attention must shift to managing post-pitch engagement to keep the momentum, to deepen partner interest, and to lead negotiation carefully.

Keys to a Successful Pitch

**Respond to Requests for Information (RFIs):**

Private actors will request more details about waste supply guarantees, land access, licensing processes, etc.



Host Site Visits: Invite shortlisted private sector candidates to inspect facilities, meet government counterparts, and understand the local context.

**Clarify Risk-Sharing Provisions:**

Address any concerns related to feedstock risk, regulatory risk, or tariff adjustments.



Negotiate Framework Terms: Begin pre-negotiations on key contract clauses such as performance targets, payment terms, incentives, penalties.

**Maintain Stakeholder Communication:**

Keep internal and external stakeholders informed to avoid misalignment or opposition.

6.4.

Building Long-Term Community and Stakeholder Support

Sustained private sector involvement depends not only on contracts but also on broad-based community support. Waste management projects, especially involving private operators, can face resistance if local interests are not considered. Thus, after private sector involvement is formalized, governments and operators must invest in long-term stakeholder mobilization.

Strategies for Long-Term Support

**Public Awareness Campaigns:**

Conduct public awareness campaigns to inform the community about the benefits of the PPP and how it will improve waste management services.

**Transparent Communication:**

Regularly disclose project progress, environmental performance, and community benefits.

**Feedback Mechanism:**

Create accessible channels (hotlines, town halls) for citizens to raise any concerns or suggestions.

**Inclusive Participation:**

Partner with universities, NGOs, and informal sector organizations to design and monitor waste initiatives, ensuring local buy-in.

**Capacity Building for the Local Governments:**

Offer training programs and technical assistance for public officials and project teams to build expertise in PPP management, private sector involvement, advanced technologies, best practices, and regulatory compliance.

Upon reviewing available information, there is a notable lack of documented cases in ASEAN countries where governments have implemented comprehensive community engagement strategies that directly support private sector involvement in solid waste management (SWM) through public-private partnerships (PPPs). While various initiatives in the region address aspects of waste management and community involvement, specific examples detailing the integration of community engagement strategies to bolster PPPs in SWM are scarce.

This gap underscores the importance of incorporating structured community engagement practices in PPP frameworks for SWM. Engaging communities through transparent communication, feedback mechanisms, and inclusive participation can enhance the effectiveness and sustainability of PPPs. By fostering public trust and cooperation, such strategies can mitigate resistance, ensure smoother implementation, and contribute to the long-term success of private sector involvement.

6.5.

Monitoring, Evaluation, and Continuous Improvement

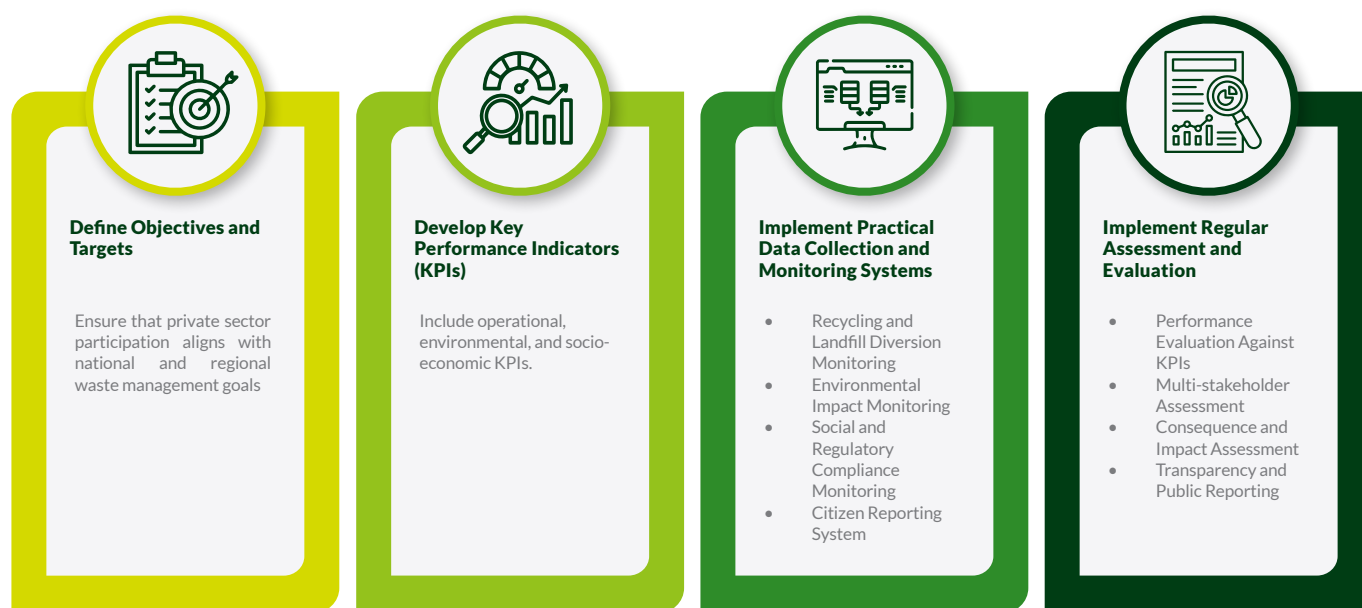
Following the private sector involvement and operationalization steps outlined earlier, ensuring long-term success requires structured monitoring, evaluation, and continuous improvement processes. A robust system will ensure accountability, track achievement of waste management goals, and adaptively improve both public and private sector performance over time. Monitoring must measure operational, environmental, and social targets, while improvement mechanisms must incentivize excellence and correct deficiencies. Technology and multi-stakeholder collaboration can make these processes more effective.

6.5.1.

Monitoring and Evaluation

The following shows elements and stages in the preparation and implementation of a solid waste management monitoring system:

Monitoring System in Waste Management



Monitoring System in Waste Management

01 Define Objectives and Targets

Ensure that private sector participation aligns with national and regional waste management goals, such as:

- Development of Waste Management Infrastructure Reduction of landfill dependence through innovative solutions
- Expansion of Waste Collection and Transportation Service Implementation of circular economy principles

02 Develop Key Performance Indicators (KPIs)

Include operational, environmental, and socio-economic KPIs.

- **Operational KPIs**
 - Percentage of waste diversion rate (total waste diverted from landfill / total waste generated)
 - Amount of collected and transported waste (households or tons/year)
 - Percentage uptime of new waste facilities (facility operational hours vs. target)
 - Amount of treated waste (metric tons/year in waste treatment facilities)
 - Material-specific recovery rates (%)
- **Environmental Impact Measurement:**
 - Reduction of carbon emissions from waste operations (tons CO₂e/year)
 - Proper handling and safe disposal of hazardous waste (% compliance)
 - Percentage increase in material recycling or recovery rates

▪ Social and Economic Aspects

- Number of job opportunities created in waste management
- Community participation and satisfaction rates
- Compliance with environmental regulations and labor standards

03 Implement Practical Data Collection and Monitoring Systems

▪ Waste Collection Monitoring

GPS tracking on collection vehicles to measure service frequency and coverage, smart bins or RFID-tagged bins to monitor pickup times and fill levels.

▪ Recycling and Landfill Diversion Monitoring

Facility weighbridges and digital records to track incoming waste by type and diversion rates, periodic waste composition audits to validate recycling rates.

▪ Environmental Impact Monitoring

Install emission monitoring devices at WtE plants or landfill gas capture sites, record hazardous waste manifests and treatment logs.

▪ Social and Regulatory Compliance Monitoring

Employee rosters and job tracking linked to project KPIs, regular third-party audits of compliance with environmental and labor standards.

▪ Citizen Reporting System

Utilize hotlines, mobile application, or online platforms to enable citizens to report service issues or give feedback. Track complaint resolution rates and community satisfaction surveys.

- **Performance Evaluation Against KPIs:**
 - Conduct quarterly or annual reviews comparing actual performance to targets for all KPIs.
 - Identify best-performing operators and regions as benchmarks.
- **Multi-stakeholder Assessment**
 - Involve government, civil society and technical experts in the evaluating service outcomes.
 - Validate self-reported data with independent verification where possible.
 - Use community surveillance and interviews to assess community satisfaction with services provided.
- **Consequence and Impact Assessment**
 - Evaluate whether operational improvements have lead to the achievement of KPIs and the desired environmental and social outcomes (e.g., reduced carbon emissions and increased job creation).
 - Identify any unintended negative impacts (e.g., increased informal dumping due to stricter fee structures).
- **Transparency and Public Reporting**
 - Publish performance scorecards or dashboards for public review.
 - Highlight both achievements and areas needing improvement to maintain accountability and community trust.



Source: <https://connectivity.asean.org/> (ASEAN Connectivity, 2015)

6.5.2.

Improvement Methods

After monitoring and evaluating private sector performance, it is critical to act on the findings to drive continuous improvement. Evaluation should not be a one-time exercise but a foundation for adaptive management, where feedback leads to concrete enhancements in service delivery, environmental outcomes, and stakeholder satisfaction. This section outlines practical strategies to improve performance, strengthen capacity, and ensure that private sector involvement remains aligned with evolving sustainability targets over time.

Practical Strategies for Performance Improvement

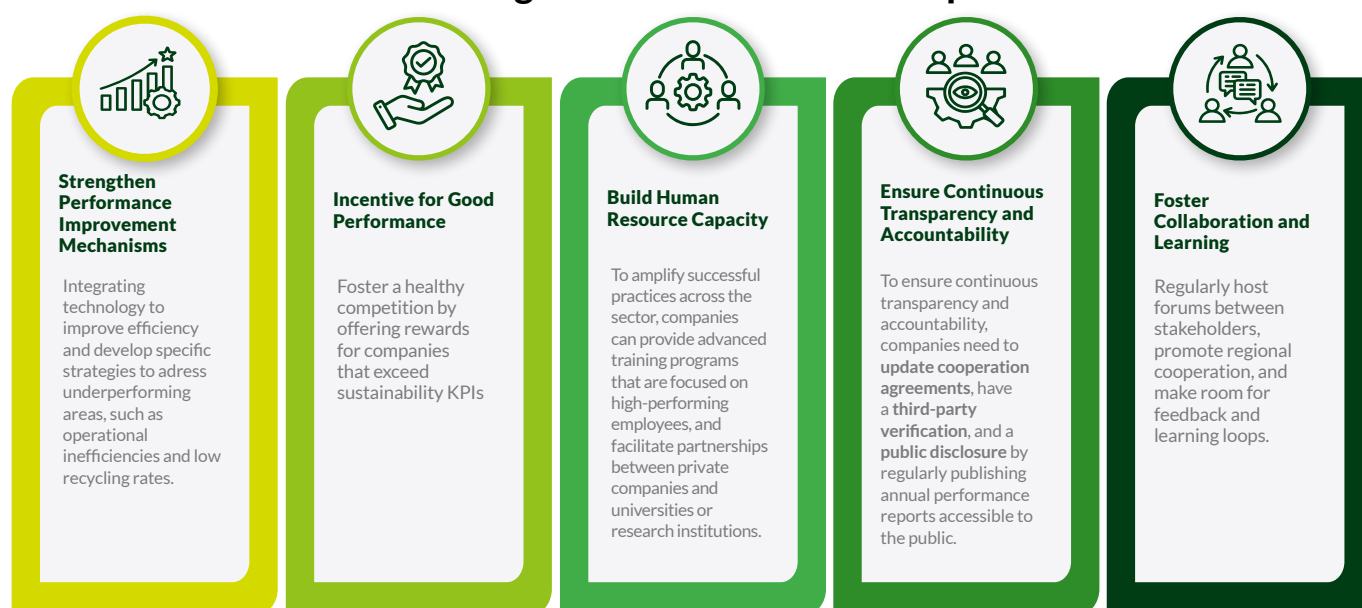


Figure: Practical Strategies for Performance Improvement

01 Strengthen Performance Improvement Mechanisms

- **Corrective Actions**
Develop specific strategies for underperforming, such as addressing operational inefficiencies, low recycling rates, or delayed infrastructure delivery.
- **Technology Integration**
Use new technologies such as AI for route optimization, blockchain for traceability, or GIS to map underserved areas to improve efficiency.

02 Incentive for Good Performance

- **Rewards**
Offer tax breaks, public recognition, or bonus payments for companies that exceed sustainability KPIs.
- **Certificates and Public Rankings**
Issue certificates of excellence or rank service providers based on sustainability performance to foster healthy competition.

03 Build Human Resource Capacity

- **Targeted Training**
Provide advanced training programs focused on high-performing company employees to amplify successful practices across the sector. Investing in high-performing teams maximizes return on capacity-building efforts and fosters sector-wide excellence.
- **Innovation Partnerships**
Facilitate partnerships between private companies and universities or research institutions to transfer knowledge, introduce new technologies, and accelerate innovation in waste management practices.

04**Ensure Continuous Transparency and Accountability**

- **Update Cooperation Agreements**
Ensure PPP contracts (see Chapter 4) remain up to date and include clear ESG expectations, performance targets, and enforcement clauses.
- **Third-Party Verification**
Engage independent auditors to verify private sector performance data and ensure reliability of reported KPIs.
- **Public Disclosure**
Regularly publish annual performance reports or create digital dashboards accessible to the public to build transparency and maintain public trust.

05**Foster Collaboration and Learning**

- **Stakeholder Dialogues**
Host regular forums between government, private sector, academia, and communities to discuss progress and challenges.
- **Cross-Regional Knowledge Exchange**
Promote regional cooperation (e.g., ASEAN-level) to share lessons learned and scale best practices.
- **Feedback and Learning Loops**
Institutionalize citizen and stakeholder surveys, workshops, and reflection sessions to integrate lessons into future planning.



07

CONCLUSION

This study reviews the opportunities, enabling factors, and practical models for enhancing private sector involvement in the solid waste management across ASEAN. It includes key lessons learned and principles that guide stakeholders in advancing inclusive, effective, and circular waste systems through public-private collaboration.

One of the important findings is the fundamental importance of policy coherence. Engagement from the private sector requires a legal environment that defines mandates and responsibilities and protects investments. Large investors and infrastructure operators often prioritize bankable project structures; contract durations aligned with capital recovery cycles; clear and balanced risk allocation; predictable and stable revenue stream (e.g. long-term certainty of waste feedstock supply. Some countries and municipalities have already provided clear regulation at the national and sub-national levels. However, the diverse context across ASEAN requires that engagement models must be adaptable. To effectively address the challenges of waste management in ASEAN, public-private partnerships (PPPs) must be carefully structured to balance flexibility, accountability, and scalability. Private sectors stakeholder, leveraging their agility and innovation, can introduce rapid and responsive solutions tailored to the specific needs. While structured PPPs may work well in mature markets with reliable revenue streams, other locations may benefit more from community-based or Small and Medium Enterprises (SMEs), or blended finance approaches that involve NGOs, development partners, or informal actors.



Effective private sector participation depends on clear policies, stable regulations, and fair risk-sharing.

Countries with coherent legal frameworks attract stronger, long-term investment. There is no one-size-fits-all model, but partnerships must adapt to local contexts, balancing flexibility, accountability, and financial sustainability. Successful models ensure predictable revenue streams and equitable risk distribution to maintain investor confidence and project viability.

Financial sustainability and risk sharing have also proofed as a key determinant of success. Private sector involvement models that provide realistic and predictable revenue streams are more likely to attract serious private investment. The revenue streams such as service fees, tipping fees, or payments based on performance, should be fairly accounted to provide security for the investors. The fairness principle will be shown in the equally fair distribution of risk. Experience shows that when risks are disproportionately borne by one party, especially the private sector, the project tends to fail.

Technology has also played a growing role in facilitating effective private sector involvement. Digital platforms that enable traceability of waste, track performance metrics, automate billing, or incentivize segregation behaviors have proven valuable in building transparency, trust, and efficiency. These tools are especially helpful in contexts where oversight capacity is limited and where stakeholders require clear data to support decision-making.

Each ASEAN Member State has their own uniqueness and each tourism area calls for special attention. Waste management in tourism-dependent zones often faces fluctuating volumes, seasonal surges, and specific types of waste such as single-use plastics and food waste from hospitality businesses. Solutions in these contexts must be flexible, resilient, and co-financed by tourism stakeholders. The future of private sector involvement in waste management across ASEAN is increasingly vital as cities face rising waste volumes and limited public capacity. Technological advancements such as traceability tools, AI, and IoT will enhance service quality and transparency. Policy developments like EPR and circular economy strategies will further expand entry points for private involvement, including in tourism and informal sector integration.



With strong public sector capacity, transparent governance, and inclusive models, Private sector involvement can become a cornerstone of resilient, circular, and equitable waste systems in the region.

To fully implement these opportunities, governments and municipalities have a critical role in establishing the foundational frameworks that enable and guide private sector involvement. Effective private sector engagement relies on supportive and conducive policy environments. ASEAN governments must proactively execute and enhance regulatory frameworks. At National level, governments are responsible for providing regulatory frameworks that set clear targets, standards, and timelines to offer legal and financial security for private investments. These frameworks must ensure policy coherence across sectors, clearly define roles and responsibilities, and incentivize innovation and circular approaches. Municipalities, on the other hand, are central to translating national policies into actionable partnerships and business models. They must create enabling environments through e.g. transparent procurement procedures, service contracts, supportive land use planning, and performance-based monitoring systems. To

facilitate this, governments can consider standardizing PPP and service contract templates that ensure transparent and competitive procurement processes and provide clear conditions, e.g. on minimum service, volume, or revenue guarantees where appropriate.

Inclusive stakeholder dialogues, involving formal and informal private actors, local communities, and civil society, development partners & NGOs, are essential to build trust and foster mutual accountability.

The public sector can play a key role in convening these dialogues, supported by development partners and international projects in facilitating platforms for knowledge exchange, co-creation, and capacity development. At the regional level, ASEAN can contribute to improvement of framework conditions by offering a platform for dialogues and facilitating peer learning across Member States. It can also serve as a platform to showcase innovative models, foster public-private partnerships, and coordinate regional investment frameworks that strengthen

private sector confidence for investments in waste management. Beyond supporting dialogue, ASEAN can play a strategic role in strengthening regional coherence and predictability. Regulatory consistency and alignment across jurisdictions can reduce transaction costs for private sector actors and enable them to scale solutions across municipalities and tourism destinations, a critical condition for investment and cross-border operations. While waste management remains a national and local responsibility, ASEAN can facilitate shared guidance on structuring PPPs, promote transparency benchmarks for procurement practices, and encourage alignment of performance-based service standards. Common regional principles on risk allocation, safeguards, and performance incentives, can help ASEAN reducing uncertainty for private sector actors operating across borders. Such regional authority does not replace national authority but enhances confidence, supports scalability, and contributes to a more integrated market environment for private sector involvement in waste management.

Annex 1

Step by Step Guide for Private Sector Involvement in Solid Waste Management

Step by Step Guide for Private Sector Involvement in Solid Waste Management

01 Preliminary Research and Planning

▪ **Transparency and Public Reporting:**

- Identify specific waste management challenges and needs within the municipality or tourism destination.
- Gather data on current waste management practices, waste volumes, and existing infrastructure.
- Gather early feedback from key government departments and local communities on perceived service gaps.

▪ **Develop a Comprehensive Proposal:**

- Prepare a detailed Terms of Reference (ToR) that includes service specifications, infrastructure requirements, and performance standards expected from the private sector. Define clear project objectives, scope, and expected outcomes.
- Highlight the environmental, social, and economic benefits of the project.
- Prepare a detailed financial plan, including investment requirements, cost breakdown, and projected returns.
- Align proposal with tender documents if public bidding is planned.

▪ **Stakeholder Mapping:**

Identify key stakeholders for decision-making, project planning, feasibility assessment, public approvals, and community buy-in. This includes local government officials, and community leaders.

02 Identifying Potential Private Sector Partners

▪ **Market Research:**

- Identify companies with a track record in waste management or related sectors.
- Evaluate potential partners based on their expertise, financial stability, and previous project experience.

▪ **Networking:**

- Attend industry conferences, workshops, and networking events to connect with potential partners.
- Use business directories, industry associations, and online platforms to compile a list of potential private actors.

- **Criteria for Selection:**

- Selection criteria should balance technical expertise, financial capacity, ESG compliance, and track record in waste management projects.
- Assess alignment with project goals.
- Evaluate their capacity for investment and operational expertise.

03 Pitch Preparation

- **Customize the Pitch:**

- Tailor the pitch to address the specific interests and capabilities of each potential partner.
- Clearly articulate the value proposition for the private sector, including potential returns on investment, risk mitigation, and corporate social responsibility benefits.

- **Prepare Visual Aids:**

Create engaging presentations, infographics, and videos to illustrate the project's benefits and feasibility.

- **Develop Supporting Documents:**

Executive summary, detailed proposal, financial plan, regulatory compliance documentation, and stakeholder analysis. Include updated KPIs and monitoring plans in supporting documents to reassure private sector on expectations.

04 Conducting the Pitch

- **Initial Contact:**

- Reach out to potential partners via email or phone to schedule a meeting.
- Provide a brief overview of the project.

- **Presentation:**

- During the meeting, present the project proposal, highlighting key points such as the problem statement, proposed solution, financial projections, and partnership opportunities.
- Use visual aids to enhance understanding and engagement.

- **Q&A Session:**

- Be prepared to answer questions and address concerns.
- Provide additional information and clarifications as needed.

- **Follow-Up Materials:**

Provide detailed documents, including the full project proposal, financial analysis, and regulatory compliance information.

05 Follow-Up Process

- **Thank You Note:**

Send a thank you email to express appreciation for their time and consideration.

- **Address Feedback:**

Incorporate any feedback received during the pitch into the project proposal.

- **Regular Updates:**

Keep potential partners informed about any developments or changes in the project.

- **Negotiation:**

Engage in detailed discussions to finalize the terms of the partnership, including roles, responsibilities, monitoring and evaluation framework, incentive mechanisms for overperformance, penalties for underperformance, and financial commitments.

- **Formal Agreement:**

Draft and sign a formal agreement outlining the partnership terms, project timeline, and performance metrics.

06 Implementation and Monitoring

- **Project Kick-Off:**

Organize a kick-off meeting to align all stakeholders on project goals, timelines, and responsibilities.

- **Regular Monitoring:**

- Establish monitoring and evaluation mechanisms to track project progress and performance including:
 - (a) Physical verification of service delivery (e.g., waste collection timeliness, infrastructure construction).
 - (b) Real-time monitoring using digital tools (IoT sensors, tracking apps).
 - (c) Regular reporting against KPIs.
 - Conduct regular reviews and adjustments as needed.
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- **Stakeholder Engagement:**

- Use quarterly public reporting and feedback channels to maintain transparency and strengthen public support.
- Maintain open communication with all stakeholders throughout the project lifecycle.
- Address any issues or concerns promptly.

Source: DESMA Center, 2024. Compilation from various sources.

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