



BLEND
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S Y S T E M I Q

MOBILIZING BLEND ED FINANCE FOR CIRCULAR WASTE COLLECTION AND SORTATION INFRASTRUCTURE

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PREFACE



Dr. Ir. Nani Hendiarti, M.Sc.

Deputy for the Coordination of Environmental and Forestry Management, Coordinating Ministry for Maritime Affairs and Investment (CMMIA)

As this report was being developed, there is a sense of momentum and optimism in Indonesia's waste management sector. Conditions are ripe to start transforming Indonesia's waste management nation-wide, as we started to get more tractions from key stakeholders, including from Development Finance Institutions (DFIs) who are increasingly looking for 'investable' co-funding efforts to support the global transition to circular economy. Local governments are also showing more interests to progress in battling a 'waste catastrophe'.

Today an estimated 55% of Indonesians – 120 million people – do not have access to waste collection, resulting in up to 40 million tonnes of waste polluting nature each year from waste burning and dumping, with grave environmental, health and economic consequences. Indonesia's mismanaged waste is the third largest source of Indonesian GHG (Green House Gas) emissions – contributing the equivalent of 127 billion tonnes CO₂e, and ranking Indonesia the 3rd largest emitter in the waste sector globally. To substantially increase Indonesia's waste collection levels in a circular manner, Indonesia would need USD4 billion of CAPEX investment.

The un-investable (high risk-low return) profile of waste management – particularly for collection and sortation systems – has discouraged key stakeholders to invest in advancing the waste sector. This paper outlines current challenges municipal waste collection and sortation projects face to raise funding from commercial and concessional capital and puts forth a set of solutions to address the underlying root causes behind this chronic underfunding. These include shifts required to improve waste system's returns, such as transitioning towards a utility-like business model and promoting indirect retribution fee and shifts required to minimise risks in investing in the waste system, such as strengthening waste governance by building a ring-fenced legal entity, donor-backed RCF mechanism, and encouraging government guarantee mechanisms.

The proposed blended finance model in this paper should be viewed as a first response towards improving Indonesia's waste system economics and as a baseline for further discussions by all interested stakeholders. In light of these, I would like to invite everyone to join Indonesia in embarking on this challenging yet exciting journey. Collective action from government, DFIs, businesses, academics, non-governmental organisations, communities, and all stakeholders are necessary for Indonesia to overcome its waste crisis. Together, we can and will bring Indonesia towards a healthy and prosperous nation for future generations.

ENDORSEMENT



P4G is pleased to support Project STOP Banyuwangi's efforts to provide integrated waste management solutions that reduce plastic pollution. This report tackles one of the hardest challenges in this sector: financing. By offering practical recommendations for policy makers, investors and businesses, the report can play a key role in improving sustainable waste management in Indonesia and beyond. The need for blended finance solutions is clear - now it's time to implement them."

Robyn McGuckin, Director of Partnerships, P4G



Waste management is one of the key challenges of our planet. Borealis as co-founder of Project STOP is therefore honoured to having contributed to a front-line change by establishing an effective and cost-efficient waste management system in selected areas in Indonesia to showcase what is possible. Our vision is to shift from today's mainly linear to a circular production of plastics, where waste management is a key success factor in turning waste into precious raw material. However, we learned how challenging it is to raise sufficient financing from philanthropic funders, hence we welcome the innovative approach of blended financing as key enabler for the establishment of sustainable waste management systems. The blended finance approach outlined in the paper owes much to the work done by Project STOP, which has pioneered several innovative solutions that have proven successful."

Markus Horcher, Director Sustainability & Public Affairs, Borealis.



This report summarizes years of experience gained through Project STOP and related projects on the challenges of financing waste management infrastructure. Importantly, it offers solutions to financing challenges. It is a data- and evidence-driven testament to the power of de-siloing investment vehicles and collaborations across stakeholder groups. As such, I highly recommend this report to private investors and policymakers in Indonesia and beyond. I invite businesses to read this report to understand their power to drive sustainable waste management systems, especially by overcoming initial CAPEX investment hurdles.

The solutions are based on experiences in Indonesia but will be equally applicable in many other regions with underdeveloped waste management systems. Waste management needs to scale rapidly, and this report shows how it can do so financially viable."

Alina Marm, Head of Global Sustainability & Circular Economy, Siegwirk



The Alliance is focused on catalysing capital towards the scaling and replication of the solution models we are developing and de-risking in Indonesia and across the world with our partners. We are encouraged to see the collaboration among various stakeholders to develop innovative financial approaches to support public-private partnerships in rolling out waste management infrastructure in Indonesia. While the work is still nascent, we look forward to contributing to developing the blended financial ecosystem with our concessional impact capital pool.”

Nicholas Kolesch, Vice President, Projects, Alliance to End Plastic Waste



Absence of sustainable financing is a key structural reason behind the widespread lack in or failure of waste management and wider circularity services and infrastructure across the Global South. A persevering disastrous sustainability gap. This seminal publication consolidates hands-on knowledge from Indonesia to offer tangible recommendations on locally adapted solutions. For example, on how to secure the funds to substantially expand waste collection services – a persisting stumbling block, on the role of philanthropic grants, on the relationship between good governance and financing. A landmark contribution to a much needed debate, directly linked to the global challenge of eliminating plastics pollution along with wider open burning and dumping of solid waste.”

Dr. Costas Velis, Lecturer in Resource Efficiency Systems, University of Leeds



This publication comes at a critical time. The regular and reliable collection and controlled management of waste is an essential frontline service that safeguards both public health and the quality of the environment. This report shines a light on the urgent and critical need for scaling up investment in the waste and resources management (WaRM) sector, not only capital, but more crucially operational (including budgetary) finance. The lessons and insights of the authors represents an important reference source for WaRM sector activists, practitioners, managers and policy makers active across the world.”

Andy Whiteman, Director, RWA Group



Sustainable financing is the biggest challenge developing countries face when addressing their municipal waste and resource management crisis by extending collection services to all and phasing out open dumping and burning. This timely report identifies the barriers and constraints impeding progress from the points-of-

view of national and local government, development agencies and commercial investors, and sets out clear recommendations for each. I hope it can help break the impasse and at last allow sustainable waste and resource management to move forward at scale where it is most needed."

Dr David C. Wilson, Waste Management Consultant and Visiting Professor, Imperial College London

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We wish to express our deep gratitude to the many experts who have guided us to better understand what it would take to make circular waste collection and sortation an investable asset class. We are especially grateful for the generous support of Partnering for Green Growth and the Global Goals 2030 (P4G) who funded this work. We also thank our government partners of the Coordinating Ministry for Maritime & Investment Affairs, Ministry of Environment and Forestry, Ministry of National Development Planning, Ministry of Public Works, Ministry of Home Affairs, the Ministry of Finance, PT SMI, PT IIF, and PT PII for their thoughtful input and guidance. We are also grateful for the expert input of the Alliance to End Plastic Waste (AEPW).

This white paper has been written by a team from Systemiq which take responsibility for the report's content and conclusions. While experts have provided significant input into the blended finance model's development, their participation does not necessarily imply endorsement of the report's contents and conclusions. Relevant examples have been drawn from reports including the Indonesia National Plastic Action Partnership¹, and other analyses and our frontline work building economically sustainable, circular waste systems with our Project STOP co-founder Borealis and Strategic Partners: Government of Norway, Nestlé, Borouge, and Siegwerk and with AEPW on their Bersih Indonesia program.

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ACRONYMS

APBD:	Anggaran Pendapatan dan Belanja Daerah: Local government budget
BAPPENAS:	Badan Perencanaan Pembangunan Nasional (National Development Planning Agency)
BLUD:	Badan Layanan Umum Daerah: Local government's public service body
BUMD:	Badan Usaha Milik Daerah: Local government-owned enterprise
CAPEX:	Capital Expenditures
DFI:	Development Finance Institution
EPC:	Engineering, Procurement, and Construction
EPR:	Extended Producer Responsibility
ETM:	Energy Transition Mechanism
GHG:	Green House Gas
Gol:	Government of Indonesia
IIGF:	Indonesia Infrastructure Guarantee Fund
IIF:	Indonesia Infrastructure Fund
JET-P:	Just Energy Transition Partnership
MoF:	Ministry of Finance
MRF:	Material Recovery Facility
ODA:	Official Development Aid
OJK:	Otoritas Jasa Keuangan (Financial Services Authority)
O&M:	Operation and Maintenance
PPI:	Private Participation in Infrastructure
PPP:	Public-private partnership
PT SMI:	PT Sarana Multi Infrastruktur
RCF:	Revolving Credit Facility
RPJMN:	Indonesia Medium Term National Development Plan
SDG:	Sustainable Development Goals
SDG1:	SDG Indonesia One Green Finance Facility
SOE:	State-owned enterprise
SPV:	Special Purpose Vehicle
Sukuk:	Sharia compliant bond
TPST:	Tempat Pengolahan Sampah Terpadu: larger scale integrated waste processing facility with waste sortation and organic waste processing
TPS3R:	Tempat Pengolahan Sampah Reduce, Reuse, Recycle: integrated processing facility with waste sortation, organic processing and sorted waste sales, usually integrated with a waste bank.
UPTD:	Unit Pelaksana Teknis Daerah/Local government's Technical Operation Unit
WTE:	Waste-to-energy

CURRENCY EQUIVALENTS

IDR1.00	USD0.000064
USD1.00	IDR15,552

EXECUTIVE SUMMARY

Today an estimated 55% of Indonesians – 120 million people – do not have access to waste collection¹, resulting in up to 40 million tonnes of waste polluting nature each year from waste burning and dumping², with grave environmental, health and economic consequences. Mismanaged waste is the third largest source of Indonesian GHG (Green House Gas) emissions – contributing the equivalent of 127 billion tonnes CO₂e³, and ranking Indonesia the 3rd largest emitter in the waste sector globally⁴. Most agree about the critical need for increasing waste collection levels and doing so in a circular way, especially in peri urban, small, and remote regions of the country, where waste infrastructure is the most lacking². Doing so would cost USD4 billion⁵ in CAPEX investment.

Fortunately, conditions are ripe for transforming Indonesia's waste management nationwide. The government of Indonesia (GOI) has led the region with several sustainable finance world firsts and is prioritising innovative finance solutions to accelerate sustainable and equitable development. Development finance institutions and the private sector are also increasingly looking for 'investable' co-funding efforts to support the global transition to a more circular and carbon-neutral economy. This complementary funding would be in addition to growing waste 'public' funding that forms the bedrock of waste management finance in Indonesia. However, investors struggle to find investable projects that meet minimum risk – return thresholds; therefore, this money stays locked as an untapped opportunity. What little investment there is in waste infrastructure (i.e., less than 1% of global DFI infrastructure investment⁶, and 3% of commercial infrastructure investment⁷) is primarily spent on waste processing such as mechanical recycling, refuse derived fuel (RDF) and waste-to-energy – which promise larger returns than waste collection and sortation.

Supported by Partnering for Green Growth and the Global Goals 2030 (P4G), this paper sets out a first response to the exam question of how to make currently un-investable circular waste collection and sortation systems attractive to DFI and commercial investors, thereby solving the intractable successful pilot-to-scale challenge. Achieving this would open much larger funding into waste system infrastructure and thereby materially accelerate achieving Indonesia's ambitious and worthy 70% marine debris reduction, 70% waste handling and 30% waste reduction targets⁸, as well as the Medium-Term Development Plan (RPJMN 2020-

2024)ⁱ and several sustainable development goal commitmentsⁱⁱ but does require important shifts to improve waste system profitability and professionalise operations.

Waste collection blended finance principles

1. **In its current form, waste collection and sortation systems are not investable** and require meaningful changes in their business models to create acceptable risk-return profiles to mobilise private sector and DFI investment.
2. **Transitioning towards a utility-type business model** is a foundational enabling factor.
3. This utility-type model relies on the regency or city **governments taking responsibility for and professionalising the collection of household and business waste service fees** (ideally supported by national policy) as a revenue source for paying a tipping fee. It also depends on a **strong and transparent governance system** that can credibly manage debt payment independently from but supported by the city treasury. Sustained revenue streams from household and business waste service fees (i.e., waste service fees) and minimum mandatory local government spending is foundational for blended finance to work in the waste sector in Indonesia.
4. **A ring-fenced legal entity** (i.e., a special purpose vehicle (SPV)) is a fundamental vehicle in local context to manage the finances of the project (both funding from various sources and profits). The SPV can choose to sub-contract part of the work to different third parties, e.g., it can sub-contract the engineering and construction to one party (i.e., EPC), then sub-contract the waste operations to another party (i.e., regency/city government owned operator or privately run).
5. **The blended finance model is designed to improve the waste system by enabling commercial capital to crowd-in the waste system.** The financing structure comprises of 3 separate components: (1) waste system infrastructure capex funded by commercial debt and equity and public funding, (2) technical advisory financing to lower implementation risk funded by philanthropic grants, and (3) a Revolving Credit Facility ("RCF") to support waste system OPEX funded by a commercial bank and guaranteed by public and/or concessional capital (or through a philanthropic grant). Long term, philanthropic and concessional financing is transitional.
6. Blended finance and commercial banking mechanisms such as **government / DFI / philanthropy guarantees, technical assistance and revolving credit facilities** are practical and effective tools to mitigate risk both for investors and government stakeholders.

Globally, waste management is funded by local government budgets. Local governments in peer low- and middle-income countries generally spend between

ⁱ Under the Government's Medium Term Development Plan (RPJMN 2020-2024), waste management has been prioritised in two national programs: (1) national program #1 on strengthening infrastructure to support economic development through providing easy access to adequate sanitation infrastructure (including solid waste); and (2) national program #6 on improving environmental quality through low carbon development and waste management efforts.

ⁱⁱ Environmentally sound waste management addresses sustainable development targets within SDG 12 (responsible consumption and production) and directly or indirectly contributes towards SDG 6 (Clean Water and Sanitation), SDG 13 (Climate action), and SDG 14 (life below water).

10-20% of their budgets on waste management⁹, while Indonesia local governments spend less than 1% (i.e., 0.7%)⁵. There is simply not enough government funding to cover ongoing waste system operating costs for all regency and city residents much less payback infrastructure investment. Therefore, Indonesian waste systems must rely on other revenue sources – primarily volatile household and business waste service fees (also called retribution fees) collected door-to-door in cash each month – and sometimes recycling material salesⁱⁱⁱ. Currently the private sector does not share the burden in funding waste collection outside of pilot projects.

The weakest part of the proposed blended finance model, and the weakest part of today's waste system are the same - the dependability of the household and business waste service fee, which is the largest source of waste system revenue in Indonesia but optional and paid in cash. To truly make waste management investable and transform Indonesia's waste collection level, the waste system revenue model must become robust. This could be accomplished by politically changing the waste service fee from optional to an obligatory tax or coupling its payment automatically with a utility bill payment (e.g., PLN electricity, PDAM water) like dozens of other countries have done. It could also be solved by bringing in an additional, dependable revenue source from the private sector through, for example, mandatory extended producer responsibility (EPR), a plastic excise tax^{iv}, recently passed into legislation and/or plastic credits. New taxes whether to households, local businesses or to industry are politically challenging and must be regulated at national level - local governments do not have this authority even though they carry the responsibility for waste system economics. But it is the only way to move today's waste economics from a fragile economic foundation to one that is robust and sustainable and therefore trustworthy for investment. Doing so would enable Indonesia to access international blended finance at scale to build world-class clean, circular waste management systems across the country and create millions of reliable green jobs.

This paper lays out the current challenges municipal waste collection and sortation projects face to raise funding from commercial and concessional capital and puts forth a set of solutions to address the underlying root causes behind this chronic underfunding. The proposed blended finance model should be viewed as a first response towards improving Indonesia's waste system economics and as a baseline for further discussions by all interested stakeholders in solving this tough funding challenge. The conceptual framework has been extensively stress-tested and improved with constructive feedbacks from key national and sub-national stakeholders, which include line ministries, local governments, government financing institutions, DFIs, philanthropies, NGOs, academia, and private sectors, and welcomes additional feedback.

ⁱⁱⁱ Some peer countries have implemented Extended Producer Responsibility (EPR) to share the waste collection cost burden with the private sector. EPR is being explored by Indonesia but is currently not a revenue source for waste system economics.

^{iv} EPR is preferred as excise taxes are rarely ringfenced for waste financing.



1. SUSTAINABLE INVESTMENT

1. SUSTAINABLE INVESTMENT

1.1 INDONESIA'S SUSTAINABLE FINANCE LEADERSHIP

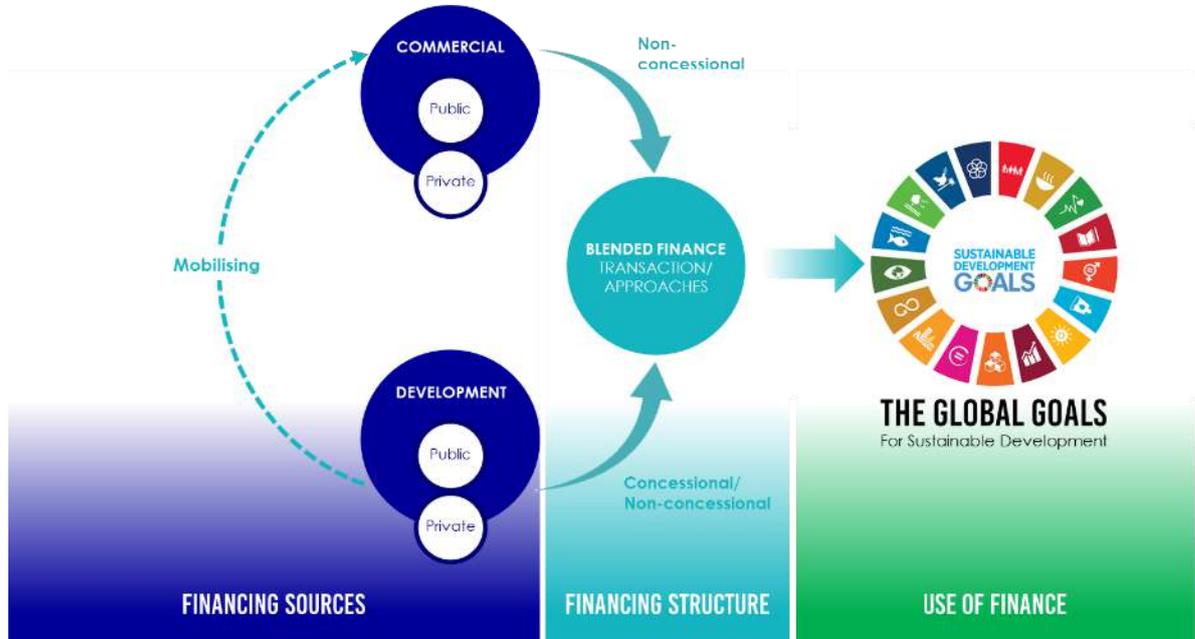
The Government of Indonesia (GOI) is prioritising innovative sustainable finance solutions to accelerate sustainable and equitable development in the country as it rebuilds the economy post-pandemic and aims to be a low-carbon leader in the region. Fortunately, there is a strong and growing focus on sustainable infrastructure investment - i.e., green infrastructure such as renewable energy, low carbon transport and waste management that directly contributes to one or more Sustainable Development Goals (SDGs) and has minimal negative impacts on communities and the environment. After years of chronic under-spending, in 2019, GOI committed USD 415 billion to primarily low carbon infrastructure spending in their 5-year National Medium-Term Development Plan (RPJMN), recognising that a sustainable future will help deliver higher growth and unlock additional economic, social, and environmental benefits. While 65% of this spend was slated to come from the state and state-owned-enterprise (SOE) budgets (e.g., PERTAMINA, PLN, Indonesia Battery Corporation), GOI aimed for private sector co-funding to bridge the balance.

Indonesia has a long track record implementing blended finance solutions with its first PPP transaction in the 1970s. Since then, the PPP mechanism has evolved to focus on social development infrastructure such as hospitals and schools. The SDGs have become a major driver of blended finance in Indonesia with the establishment of the Climate Change Trust Fund (ICCTF) in 2010, and the Millennium Challenge Account Indonesia (MCAI) in 2013. More recently, to make it easier to invest in the country's sustainable development, in 2018 **GOI led the region with several sustainable finance world firsts** - from the 1st green sukuk (green bond) for USD1.25 billion, to the 1st sustainable land use bond for a private rubber plantation for USD90 million, to the 1st blended finance platform of its kind, SDG Indonesian One (SDG1) to unlock USD3 billion in sustainable infrastructure investment into social, health, water, energy, and green projects by de-risking and combining different types of capital. SDG1 was followed by other flagship blended finance initiatives like the Energy Transition Mechanism (ETM) and most recently the Just Energy Transition Partnership (JET-P), a USD20 billion energy commitment, launched at G20 in November 2022. Indonesia has also become the largest issuer of green bonds in Southeast Asia.

Blended finance has been a cornerstone of Indonesia's sustainable finance leadership agenda. Blended finance uses public, development finance and/or philanthropic capital to mobilise additional external private commercial finance for SDG-related investment. Effectively it incentivises private sector investors to invest in sustainable infrastructure investments that they would not normally consider by materially improving project risk-return profiles through mechanisms like development guarantees, subordinate/first loss debt and equity, insurance, currency hedging, technical assistance, and outcome-based payments. Indonesia's Ministry of Finance (MoF) and financial regulator, OJK, have spearheaded this work. MoF has extensive experience in Public Private Partnerships (PPP) and offers guarantees through the Indonesia Infrastructure Guarantee Fund

(IIGF) and funding facilities managed by the Ministry of Finance investment vehicles, PT SMI (PT Sarana Multi Infrastruktur) and PT IIF (PT Indonesia Infrastructure Fund). OJK has also led with several sustainable banking regulations.

Figure 1: Blended Finance Approach, aimed towards Mobilising Additional Commercial Capital into the Waste System¹⁰



Source: [OECD, 2017](#)

Despite the considerable sustainable finance momentum, external investors do still struggle to invest in Indonesian infrastructure. Above all, a predictable, long term regulatory framework is critical for private capital to flow. Ministry and SOE budgets and planning cycles are often done on an annual basis, resulting in significant long-term uncertainty for developers and investors whose investments often require lengthy payback tenures. Investors have also struggled working effectively with some government institutions.

1.2 INFRASTRUCTURE CLASS PRIVATE CAPITAL MOBILISATION

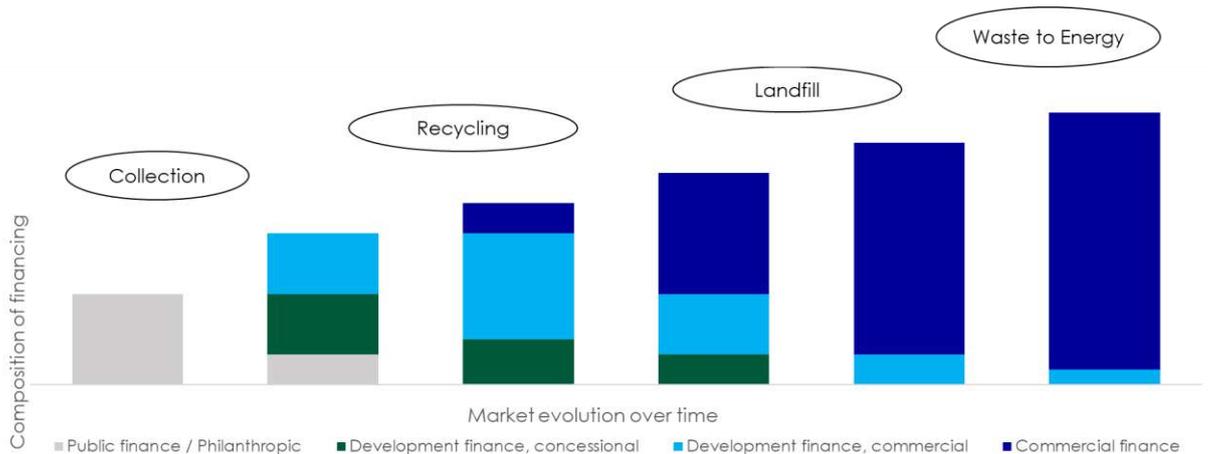
Infrastructure capital mobilisation evolves over time as revenue models and cost structures solidify. Before infrastructure economic models are proven, they rely almost entirely on public and philanthropic funding. When pilot models show some viability, however, development finance can begin investing with concessional capital. As markets mature^v, and projects further professionalise their economic model and prove their feasibility at some scale, more funding opens first from development finance and then private commercial capital. Concessional capital alone is not enough to achieve the SDGs, but targeted use of blended finance, which enables commercial investors to achieve higher returns at lower risk thereby making such investments more attractive, can catalyse the change needed to

^v Commercial investment is also dependent upon macro factors beyond the control of one project (i.e. regulation, competitive dynamic, overall market size and trend).

address the underlying root causes and aid waste operators and local governments to transition towards more investable business models.

Waste and recycling infrastructure classes are at different points within this investment spectrum. On the investable side, are processing technologies which have a decade or more experience, a well-laden path to sustainable economics, successful examples in the market, and investment templates. On the other end of this continuum, in the pre-investable state, sits waste collection and sortation.

Figure 2: Financing composition based on infrastructure market readiness



1.3 INDONESIA INVESTMENT INTO WASTE INFRASTRUCTURE

Today, half the population either burn or dump an estimated 40 million tonnes of waste into the environment every year with grave environmental, health, climate, and economic consequences. To foundationally fix this, USD3.8 billion investment is needed in waste collection and sortation infrastructure^{vi}.

Indonesia's Waste Challenge in Numbers

1. **Up to 120 million** people lack access to waste management services in Indonesia¹
2. **30-40 million tonnes of waste** (of which 3-4 million tonnes of plastic) are mismanaged every year in Indonesia. Ocean plastic leakage in Indonesia is estimated to reach **780,000 tonnes per year** by 2025¹.
3. Most of the unmanaged waste is being burnt releasing dioxins, heavy metals, and carbon di- and monoxide into the atmosphere along with other greenhouse gases or dumped into the environment where it contaminates soil, groundwater, rivers and eventually the ocean, with dire health, economic and environmental consequences

^{vi} The total infrastructure investment needed for circular waste systems to achieve 80% waste handling by 2025 is approximately USD 3.8 billion (IDR 54 trillion) – 21% lower than the total infrastructure investment needed for linear system (approx. USD 4.8 billion or IDR 67 trillion) – assuming at least 50% of waste is recycled or otherwise processed (e.g. compost or fertiliser) and therefore diverted from going to landfill.

4. Mismanaged waste is the **third largest source of Indonesian GHG (Green House Gas) emissions** – contributing the equivalent of **127 billion tonnes CO₂e³**, and ranking Indonesia the 3rd largest emitter in the waste sector globally⁴
5. Annual economic losses from leaked municipal plastic waste to the ocean is estimated to be up to **USD33,000 per tonne¹¹** or **USD26 billion** for ocean plastic leakage in Indonesia alone
6. Projection of financing needs for waste infrastructure to double waste collection to supply waste services for more than 80% of households in Indonesia within 5 years: **USD3.8 billion⁵**

While there is broad agreement about the importance of improving Indonesia's waste system, so far, the conditions have not been ready for material levels of waste infrastructure investment. For example, the '*Investment Package for National Priority Infrastructure Projects*'^{vii} only commits 1% of public infrastructure investment into the waste management sector¹² – and the 1% that is committed is almost solely for waste-to-energy projects, rather than waste collection and sortation. In addition, local government budget allocation for waste management is only 0.7%, a level much lower than the 10-20% average of peer low and middle-income nations⁹.

Such a small level of investment into waste infrastructure is not unusual. Total official development aid globally for solid waste management infrastructure is less than ½ of 1% (i.e., 0.4% or USD 567 million globally) and this has remained constant over the last decade from 2010 to 2019. Similarly, almost all investment made has gone to waste-to-energy and other waste processing with more attractive returns than waste collection.

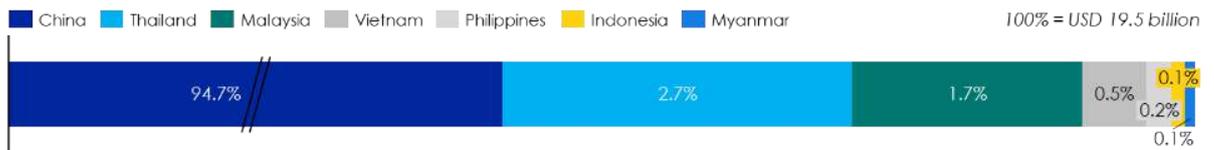
Global commercial funding into waste infrastructure has fared slightly better. On average, from 2008 to 2020, private investment in waste has accounted for roughly 3% of total private participation in infrastructure ("PPI"). In addition, investment commitments in municipal solid waste have decreased significantly over 2020 and 2021. Pre-pandemic they reached 4% and are now only 0.2% globally.

Commercial finance flows to the waste sector have been particularly limited in Indonesia with total commitments to municipal waste from 2008-2021 only amounting to USD19 million, or less than 0.05% of total PPI. In fact, Indonesia ties for lowest commercial waste funding amongst its East Asian peers. In contrast, China's waste PPI investment attracted USD18 billion across 214 projects, accounting for nearly 95% of PPI waste infrastructure projects in East Asia^{viii}.

Figure 3: country share of investment commitments in MSW infrastructure projects with private participation in East Asia, 2008-2021¹¹

^{vii} The Investment Package for National Priority Infrastructure Projects was based on the Coordinating Ministry for Economic Affairs (CMEA) Regulation No. 5/2017 and its revisions. Some of the infrastructure project list in this document were stated in RPJMN and some are not, as these infrastructure investment plan was a part of Gol's strategy for accelerating infrastructure delivery through various sources of financing (e.g., state/regional budget, SOE budget, and private sector budget).

^{viii} Includes China, Malaysia, Thailand, Myanmar, Vietnam, Philippines, and Indonesia



As shown, development and commercial finance are largely absent from waste collection and sortation investment. Instead, philanthropic actors play a leading role in providing grant funding at this stage, with no expectation for financial returns. This is a common investment pattern for pre-investable industries – but with an estimated 120 million people without access to waste services in Indonesia, substantially more infrastructure funding needs to be unlocked to scale waste services to levels that will reach national targets and materially reduce waste pollution. This paper proposes a blended finance approach for this primarily un-investable infrastructure class to attract much needed investment.

Figure 4: Investment going into the waste system globally and in Indonesia^{6,7}

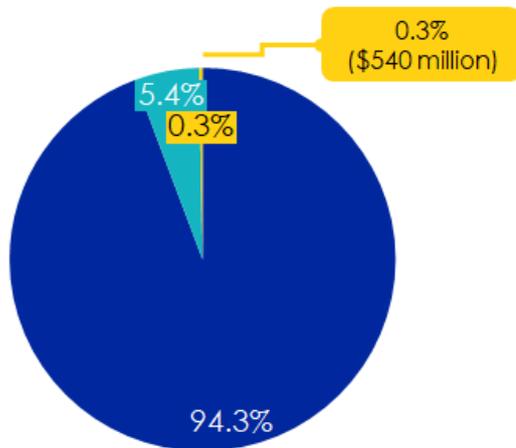
Globally, Municipal Solid Waste infrastructure projects have failed to attract public and private investment. This trend is particularly pronounced in Indonesia.

■ Other infrastructure (incl. energy) ■ Transport ■ Water and sanitation ■ Municipal Solid Waste

Globally

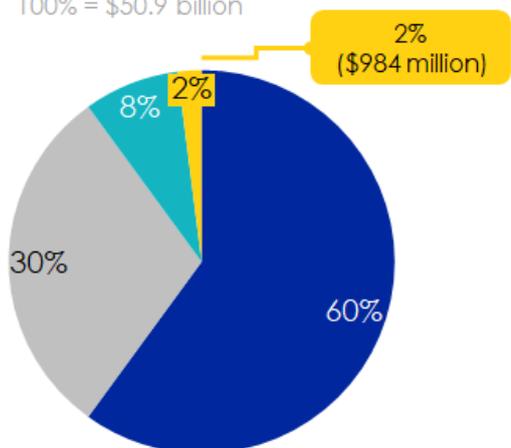
ODA spend on Infrastructure (2020)

% of total ODA infrastructure spend
100% = \$185.7 billion



Private Participation in Infrastructure (PPI) Investment (2020)

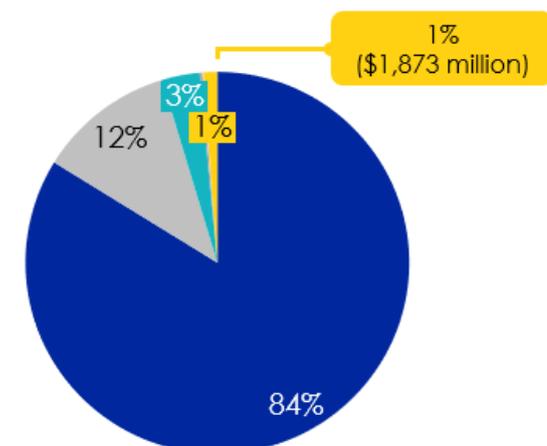
% of sector share on investment commitment in infrastructure projects
100% = \$50.9 billion



Indonesia

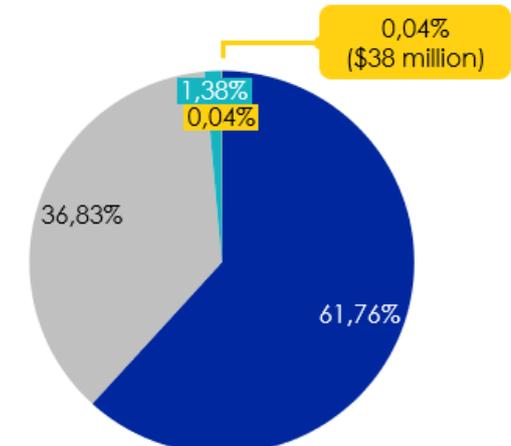
Investment Package for National Priority Infrastructure Projects (from 2017 to date)

Sector share of investment commitment in priority infrastructure based on CMEA Regulation No. 5/2017, USDm (% share of total), funded through APBN/D, BUMN/D, & Private Investment
100% = \$161 billion



Indonesia PPI Investment (from 2008 to 2021)

Sector share of investment commitment in infrastructure projects from 2008 to 2021, USDm (% share of total)
100% = \$52 billion





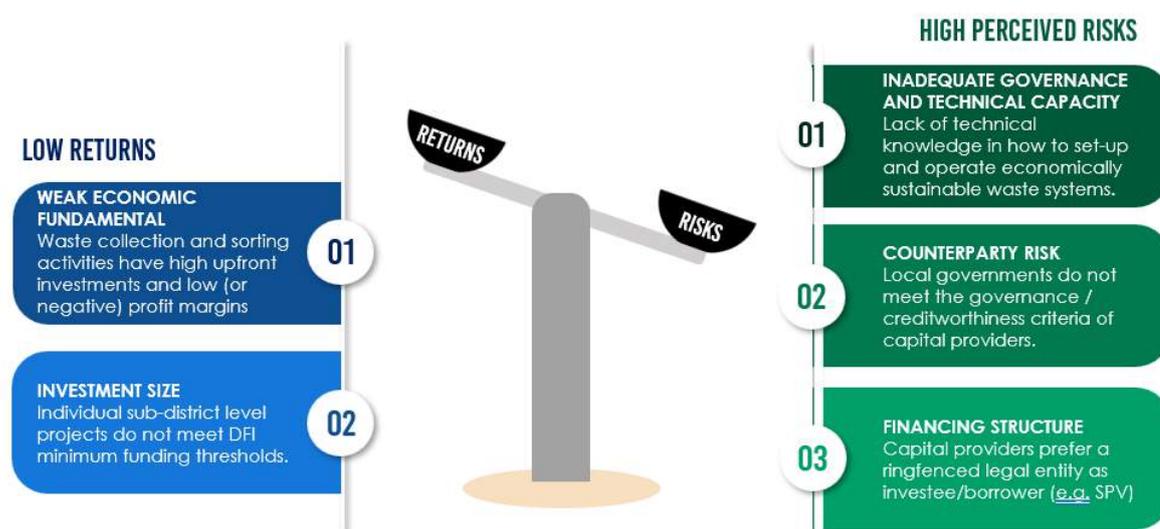
2. BARRIERS TO WASTE INVESTMENT

2. BARRIERS TO WASTE INVESTMENT

Today, business models for waste collection and sortation systems in most rapidly developing economies including Indonesia are not attractive for commercial or development finance investment because their perceived risks far outweigh potential returns. Yet, considering the constraints on public finance in Indonesia and the substantial investment needed to increase access to waste collection, using contributions from other funding sources is critical to scaling waste management nationally. This chapter outlines what must be solved to increase waste investment.

There are unique barriers waste collection systems in Indonesia face which hinder their ability to attract private and concessional capital, instead relying on scarce public and philanthropic funds. These challenges can be split into 2 main categories as illustrated in Figure 5: **Low returns and high perceived risks**.

Figure 5: Risks and returns balance for current waste system in Indonesia



2.1 LOW RETURNS

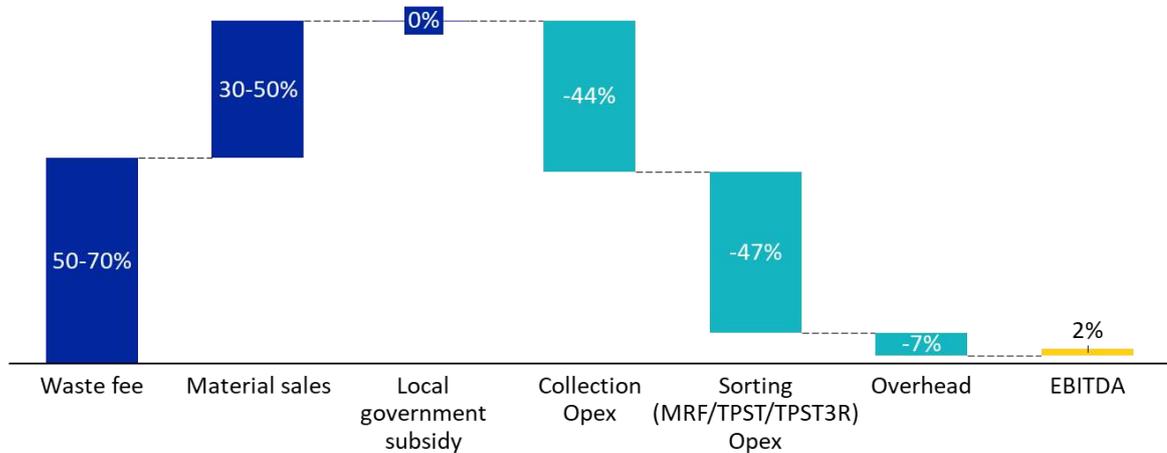
WASTE COLLECTION SYSTEMS ARE BASED ON A FUNDAMENTALLY WEAK ECONOMIC MODEL

Collection and sortation activities are characterised by high upfront investments into capital expenditure (e.g., construction of material recovery facilities (MRFs), organic processing, trucks and tricycles and waste bins), and low waste system revenue, often not enough to cover their operating costs much less pay back infrastructure CAPEX loans. As a result of their weak EBITDA, even when revenue sources are sufficient, waste collection and sortation system financing needs are distinctly challenging, requiring long tenors and/or lower interest rate expectations to have the capacity to repay the investment.

The chart below describes a typical Project STOP revenue and cost structure serving a community of ~40,000 people. The dark blue boxes on the left highlight the three usual Indonesian waste revenue streams - material sales, waste service fees and

local government subsidies while the light blue boxes on the right show the primary cost buckets of waste collection, and overhead, with a small above break-even profit (in yellow).

Figure 6: General circular waste system revenue and cost structure^{ix}



Importantly, the cost structure of many Indonesian circular waste systems is optimised to run at less than USD35/tonne including full waste stream collection, material sorting, organics processing and safe disposal. Therefore, cost management is already lean with relatively transparent fixed and variable costs. The largest margin gains are possible on the revenue side – especially from optimising the level and reliability of waste service fees and local government contributions which tend to be both volatile and insufficient.

Challenges with waste revenue sources

- Household and business waste service fees:** Waste service fees are collected door-to-door, in cash, from each household every month. **This direct cash-based fee collection system is characterised by volatile payment rate, low transparency, and elevated risk of fraud.** This labour-intensive model also implies high transaction costs and poor data collection and payment records, which often leads to a lack of payment enforcement from local government. As a public service aimed for all residents, waste collection systems need to maintain affordability for users, limiting possibilities for aggressive pricing strategies. Globally waste fees are considered affordable if the cost per household is lower than 1% of household income in low-income countries or 2% in middle-income countries¹³. In Indonesia, waste fee typically ranges between 0.2% and 1.0% of average household income^{14,x}, below global averages, which suggests that waste fees are affordable and likely represent an increasingly small percentage of total disposable income as the country's economy grows. However, due to local government historically setting fee amount too low (IDR1,000-5,000 per month per household), the community's willingness to pay remains limited.

^{ix} Waste Collection and Sortation System Financials extrapolated based on Project STOP Jembrana and Project STOP Pasuruan actual financials.

^x Based on average monthly wage for formal worker of Rp2.0m to Rp2.4m and waste fee of Rp5,000 to Rp20,000 per month

Furthermore, waste service fee regulation is a politically charged topic, which not only requires approval from the Mayor/Bupati, but also from local parliament (*Peraturan Daerah/Perda* – Local Regulation).

- **Material sales:** Recyclable materials collected are sorted and commonly sold to local junk shops, aggregators and/or recyclers. The post-consumer material market pricing is tied with oil prices (or similar market forces for other recyclable materials) resulting in unstable week-to-week earnings. **Given the limited size of local waste operators they rarely can build sufficient material reserves to weather severe market downturns as well as limited power to negotiate advantageous pricing.**
- **Government subsidies:** Finally, local governments can choose to subsidise waste operations through allocation from their annual budget (APBD). However, today^{xi}, **little budget is distributed to waste management by local government.** Currently, the average proportion for waste management spending by regency and city government is only 0.7%, in comparison to the 10-20% average of peer low and middle-income nations⁹. In addition, what spend is allocated is often restricted to specific funding categories (e.g., collection worker wages).
- **Private sector funding:** While there is discussion about implementing extended producer responsibility (EPR) to share the burden of waste collection costs with the private sector, so far private sector participation is limited to a few pilot projects.

As a result of these unstable revenue sources, local waste collection and sortation systems often struggle to breakeven and cannot generate attractive returns for potential investors.

MINIMUM INVESTMENT SIZES REQUIRED BY INVESTORS IS UNATTAINABLE FOR DECENTRALISED COMMUNITY-BASED WASTE SYSTEMS

Most commercial and DFI capital investment require a minimum funding threshold to keep transaction costs and administrative burden to a minimum. Several institutions actively involved in infrastructure financing, including the Asian Development Bank, PT Sarana Multi Infrastruktur (PT SMI (Sarana Multi Infrastruktur)), and Indonesia Infrastructure Finance, have indicated typical funding size range between IDR 75 billion (USD 5 million) to IDR 750 billion (USD 50 million). However, Indonesia's highly decentralised waste governance means waste systems in rural areas are dominated by small-scale community-based systems serving between 1,000-10,000 households, far below the scale necessary to reach the minimum funding threshold of commercial and DFI capital investors.

^{xi} Mandatory Basic Service is a term used by the Government of Indonesia, which consists of six categories of services by local governments, namely education, health, public works (drinking water and domestic waste), community welfare, and social affairs. Public services that are categorized as Mandatory Basic Service have a higher priority on the local government agenda compared to other types of services that are listed as Mandatory Non-Basic Service. Because currently the relevant ministries are not uniform in understanding that waste management is part of Mandatroy Non-Basic Service in regulations related to Regional Government, and its derivative implementing regulations, it often has a lower priority, and thus the budget allocated to this sector is lower.

2.2 HIGH PERCEIVED RISKS

WASTE OPERATORS USUALLY OPERATE WITHIN LOCAL GOVERNMENT STRUCTURES AND ARE EXPOSED TO COUNTERPARTY RISK

The owners and operators of waste systems are often local city/regency governments that do not meet the governance and/or creditworthiness criteria of funders/lenders. In part because local government unit (Dinas), who acts as the champion for waste management in local context, often lack the scale, technical credibility, political permanence and risk ownership needed for lender creditworthiness. In addition, local politics present challenges in supporting new programs sustainably.

LOCAL STAKEHOLDERS LACK TECHNICAL AND INSTITUTIONAL CAPACITY

With few large, functioning waste systems in Indonesia, there is a general lack of knowledge in how to set-up and operate economically sustainable, efficient, modern, circular waste systems. In addition to the technical knowledge required to run large-scale waste systems, there is also a need for strong institutional capacity that can reliably measure and monitor and evaluate both financial and operational metrics, and report on progress to stakeholders. In most cities, neither technical nor governance capability exists and must be built.

INADEQUATE FINANCING STRUCTURE

Capital providers prefer ring-fenced legal entities as investees/borrowers (i.e., a special purpose vehicle), which is largely absent in local waste systems. Most local government entities that champion waste management efforts do not have prior experience in structuring and executing innovative financing schemes, limiting financing options that are perceived as implementable in a local context.



3. SOLVING WASTE INVESTMENT

3. SOLVING WASTE INVESTMENT

Blended finance can be an effective instrument to accelerate investment into waste system infrastructure. **To work, a circular waste collection and sortation blended finance model must adapt to the needs and appetites of all constituents:**

- **National government** needs local government to take more responsibility for their waste system finances and to ensure waste systems built are sustained rather than abandoned. They also need to leverage non-government funding sources to stretch their government budget allocated towards infrastructure further.
- **Local governments** need financial terms that are achievable without an undue burden on their regional budgets (i.e., not more than IDR150k/tonne of waste collected) and often technical support to efficiently setup and operate new waste systems.
- **DFI and commercial investors** need the surety of reliable repayment of their loans (i.e., national government guarantee), an adequate return (i.e., 5-10% concessional return and 20%+ commercial return) and minimum project investment size. In addition, DFI will often require clear and measurable development targets, minimum commercial capital leverage targets, and alignment with national government development priorities.
- **Philanthropic funders** often need matched funding for each dollar invested and assurance that minimum impact targets are reached (e.g., plastic tonnage collected, GHG tonnes reduced, lower coral reef impacted).
- **Project developers** need adequate resources to provide or contract technical assistance, and ensure risk is shared across stakeholders.

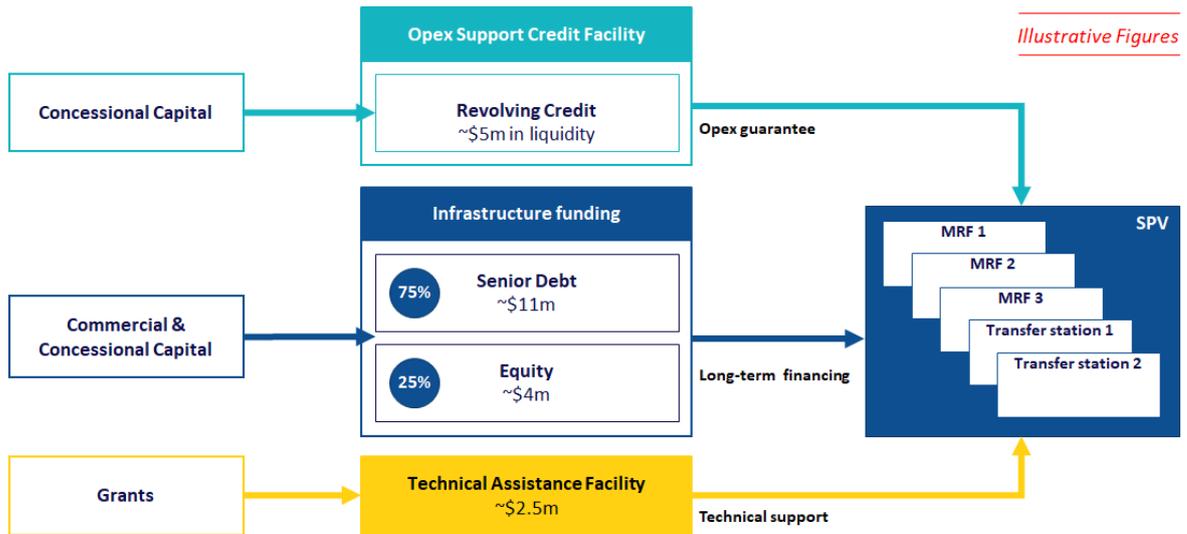
While there are few established guidelines to design and develop blended finance structures for waste collection and sortation projects, successful examples in adjacent industries exist that have managed to improve industry returns while reducing investment risk, providing insights on potential roles of different stakeholders to mobilise concessional and commercial capital. The following key learnings are based on a selection of existing blended finance case studies as well as interviews with key stakeholders, including financing institutions and national and local government officials.

3.1 PROPOSED WASTE COLLECTION BLENDED FINANCE APPROACH

PROPOSED BLENDED FINANCE STRUCTURE AND SOURCES OF CAPITAL

The design of each project under this blended finance scheme relies on three sources of capital to fund three distinct structural components (Figure 7).

Figure 7: Sources and Uses of Capital in Proposed Blended Finance Structure



Concessional capital will be used to improve the credit profile of the project. To address the current business model's fundamental risk associated with volatile and unreliable waste service fees, **the blended finance solution will facilitate local governments to transition their waste management operations towards a utility-like business model**, like water infrastructure, where local governments would agree to enter into a service agreement with a project developer and pay a tipping fee which would cover the operating costs of the waste system, as well as the repayment of the infrastructure loan. Recognizing that few regencies today would be willing to assume this commercial risk, **the proposed blended finance solution will deploy concessional capital in the form of a guarantee to backstop the tipping fee obligations of local government**. By directly supporting this business model transition, it supports sustainable and reliable cash flows, which are a pre-requisite for structured financing commercial investment.

Recognising local government's lack of technical and institutional capacity to support the development and implementation of large-scale waste systems, as well as the substantial support local government will need to transition to a utility-like business model, technical assistance will be a core tool to ensure the successful implementation of the project. **The proposed blended finance solution envisions philanthropic grants as the primary funding source for this technical assistance**, either integrated directly within the blended finance facility, or operating as a separate entity.

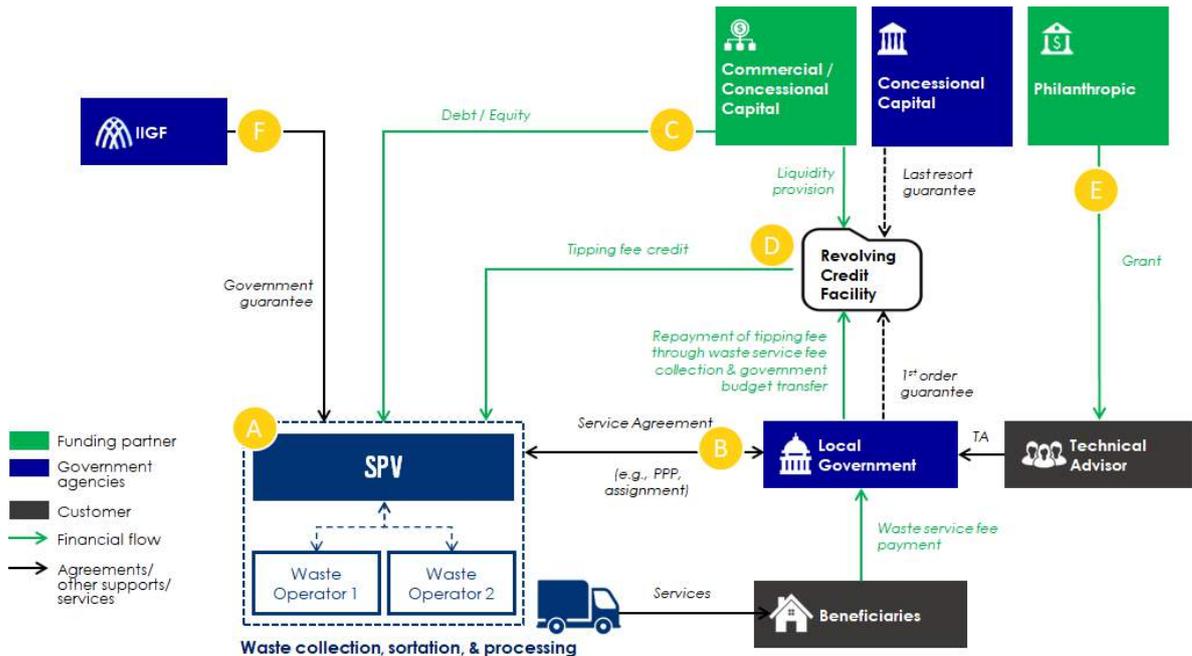
Finally, **commercial capital will be deployed to finance the infrastructure investment and development costs required to set-up circular waste collection systems**. Mobilisation of commercial capital is key to bridge the USD4 billion waste infrastructure investment gap. In addition, private sector participation can help deliver infrastructure projects faster and more effectively than traditional government procurement, with improved operational efficiency and high emphasis on quality of service to end-users. **Concessional capital can also be deployed**

alongside commercial capital within the same capital structure to lower the overall cost of capital or provide an additional layer of protection to commercial investors.

PROPOSED BLENDED FINANCE SCHEME

Figure 8 describes the proposed blended finance scheme, below.

Figure 8: Illustrative waste collection and sortation project financed by proposed blended finance scheme



- A** **Project developer sets-up a ring-fenced legal entity (i.e., an SPV) specifically formed for the purpose of this transaction**, to manage the economics of the project (both funding from various sources and profits). The project developer will act as the equity investors of the SPV. The SPV can then choose to sub-contract part of the work to different third parties, e.g., it can sub-contract the engineering and construction to one party (i.e., EPC), then sub-contract the operation to another party (i.e., O&M), and another for technical assistance for the implementation of the project.
- B** **The SPV enters into service agreements with local governments** to build waste facilities and setup new waste systems. Local governments commit to contribute a pre-agreed tipping fee to the SPV to cover waste system operating costs and the payback of the infrastructure loan.
- C** **Concessional and commercial debt capital** funds the SPV to purchase waste infrastructure and setup waste systems. Blending concessional capital can lower the overall cost of capital, as traditionally seen in successful blended finance structures, although a purely commercial model is possible. Infrastructure investment covers the construction of waste sorting and processing facilities (i.e., MRFs or locally called TPSTs), waste processing equipment (e.g., conveyor belts,

weigh bridges, balers, etc.), waste collection trucks and tricycles and waste bins.

- D A Revolving Credit Facility (RCF) is setup** to allow local governments to borrow money repeatedly to a set dollar limit while repaying a portion of the current balance through loan payments. This OPEX support mechanism provides a standby credit line to cover the short-term liquidity risk of local government tipping fee payment obligations and is one of the more innovative components of the model. The RCF can be funded by a commercial bank (or philanthropic funding) and will benefit from a 1st resort guarantee from local government and a last resort guarantee from concessional capital^{xii} or the national government. As a fundamental component of this blended finance structure, the OPEX support facility addresses two key barriers for the mobilisation of private finance: (a) commercial risk as the RCF covers the short-term risk that the local government fails to make full payments to the waste operator in accordance with the terms of the service agreement and (b) lack of public finances giving local governments much needed time to professionalise their waste system revenue models. The repayment mechanism of the RCF will be structured so that waste service fee collected from households and businesses for waste services are directly paid by local government into the revolving credit facility.
- E Philanthropic capital funds technical assistance to reduce implementation risk.** Experienced technical assistance is used to build local government and waste operator capacity to setup and operate new circular waste systems sustainably and to support national policy needed to professionalise the waste system revenue model. Technical assistance can also support national and local policy work to accelerate the transition towards more professionalised waste service fee collection (e.g., local waste tax, joint utility billing system)
- F Indonesia Infrastructure Guarantee Fund (IIGF) guarantees infrastructure risks stemming from government inaction^{xiii}** that could result in financial losses for PPP infrastructure projects, e.g., delay in license and permit issuance, change in regulation, failure of tariff adjustment, failure of network/facility integration, and other risks covered or allocated to the government in the PPP contract.

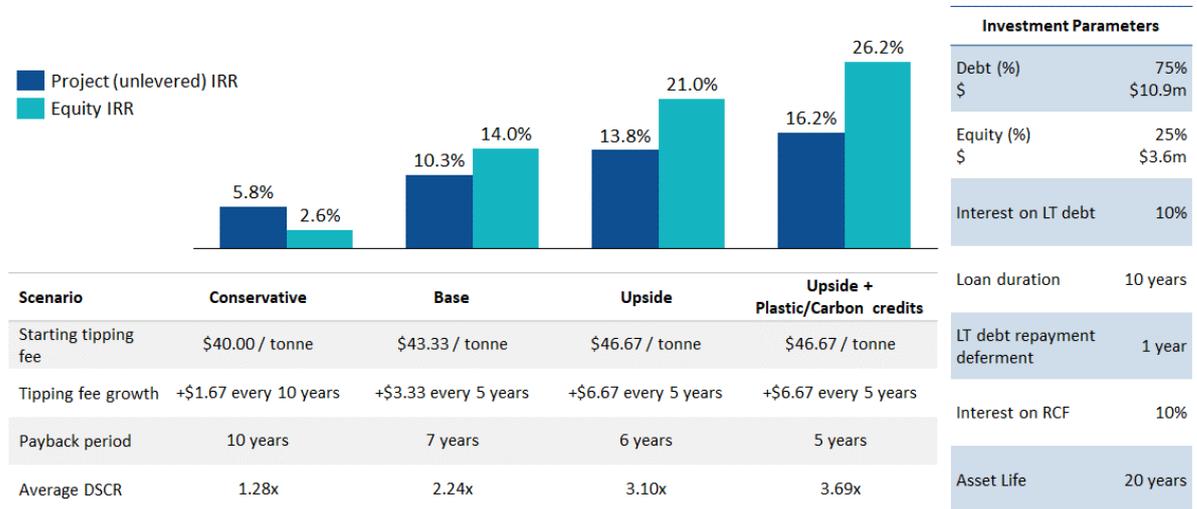
Initial high level financial analysis of the proposed blended finance structure indicates positive investment returns. The analysis in Figure 9 was based on an illustrative regency-scale waste system modelled after Project STOP's circular waste collection and sortation infrastructure design based on a loan repayment over 10 years. The resulting preliminary project IRR range of 6% to 14% falls within the investment parameters of several DFIs and impact investors Systemiq has

^{xii} Based on preliminary modelling, USD1 of non-cash guarantee is expected to mobilise USD3 of private capital for infrastructure funding

^{xiii} The IIGF acts as a guarantor for the various infrastructure risks stemming from government inaction that could result in financial losses for PPP infrastructure projects, including, for example, license delays, financial close termination or delays, amendments to legislation and regulatory provisions, or changes to tariff structure.

interviewed. While further in-depth analysis is required, this initial data point lends credibility to the financial viability of the proposed blended finance solution.

Figure 9: High level project return for a city-level waste collection and sortation infrastructure project
Preliminary investment return analysis indicates waste management is financially attractive for impact investors and DFIs



LOCAL GOVERNMENT TIPPING FEE PAYMENT

No local government likes the idea of committing to a long-term tipping fee obligation. This fact has setback numerous waste-to-energy (WTE), chemical recycling, and RDF projects in Indonesia. For example, of the 12 cities included in the WTE Project program (Perpres 35/2018), only Surabaya has commenced with the WTE of Benowo (2022). The city of Denpasar has withdrawn from the program because it felt that the tipping fee was too high, despite national government regulations providing a subsidy of up to 49% of the total tipping fee.

While the proposed blended finance approach also relies on a local government tipping fee obligation, in this model, there is a revenue source, i.e., household and business waste service fees, that if collected professionally will be enough to cover the full tipping fee cost and potentially even contribute extra funds to local government treasuries. However, getting from today's volatile, ad hoc waste service revenue collected from 30-40% of households to a more robust and reliable system collected from 90%+ will take time and require commitment at national government level via a national waste tax, joint utility billing, extended producer responsibility, funds directed from the new plastic excise tax or some combination of these revenue sources. This blended finance model allows that time by using the revolving credit facility. It also caps demand from local treasury budgets at a pre-agreed ceiling.

Figure 10: Illustrative local government tipping fee payment breakdown over time

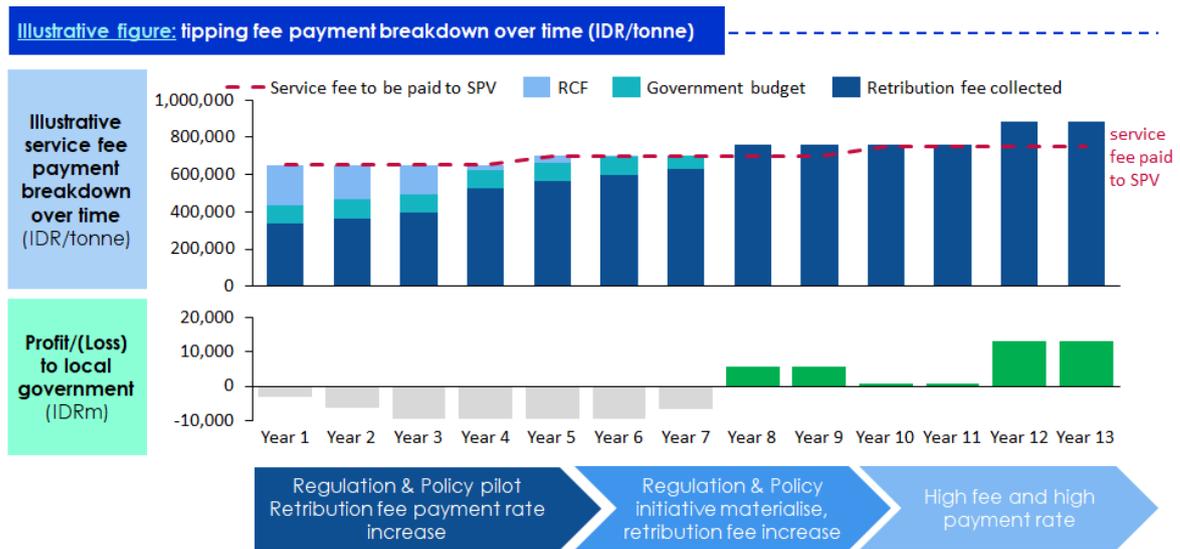


Figure 10 shows how this payment mechanism works overtime: The repayment of the infrastructure loan(s), and waste system operating costs are bundled into the tipping fee. The SPV is guaranteed payment of the tipping fee by drawing down liquidity directly from the RCF, effectively ensuring the SPV is not exposed to the commercial risk associated with waste service fee payment rate.

The Repayment of the RCF by the local government, and its associated fee and charges, can be entirely covered by waste service fees once fee collection has been professionalised. However, in the meantime, if the collected waste service fees are insufficient to cover the RCF drawdown, regency/city governments will contribute funding from their treasury budgets (i.e., APBD) up to a pre-agreed ceiling (e.g., IDR100-150k/tonne of waste collected). Any outstanding balance at the end of the year would be rolled over to the next year, incurring interest.

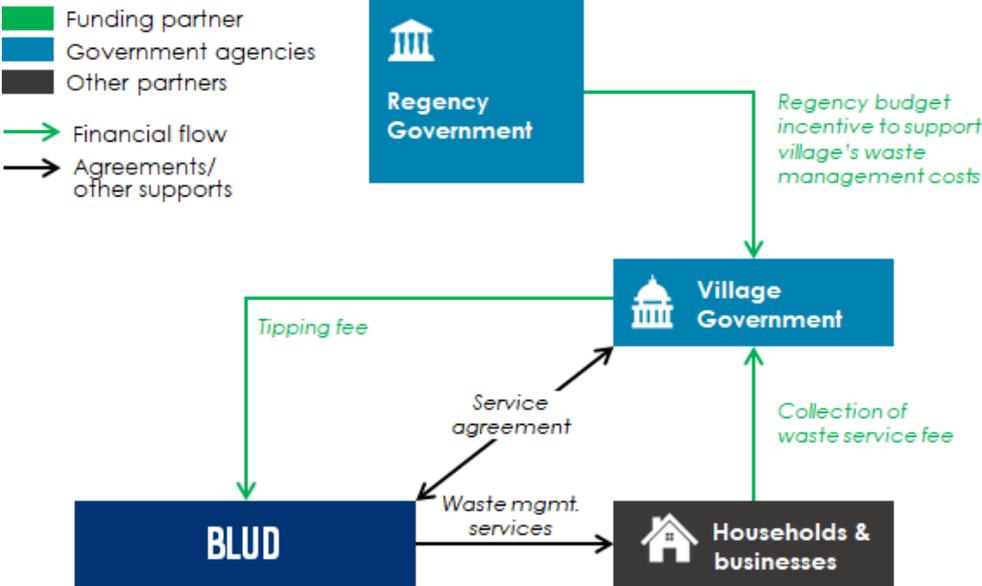
Local governments need national government support to professionalise waste system revenue. The weakest part of the proposed blended finance model, and the weakest part of today's waste system are the same - the dependability of the household and business waste service fee, which is the largest source of waste system revenue in Indonesia but optional and paid in cash. To truly make waste management investable and transform Indonesia's low waste collection level, the waste system revenue model must become robust. This could be accomplished by politically changing the waste service fee from an optional waste service fee to an obligatory tax or coupling its payment automatically with a utility bill payment (e.g., PLN electricity, PDAM water) like dozens of other countries have done. It could also be solved by bringing in an additional, dependable revenue source from the private sector through, for example, mandatory extended producer responsibility (EPR) or a plastic excise tax, recently passed into legislation.

However, new taxes whether to households, local businesses or to industry are politically challenging and must be regulated at national level - local governments do not have this authority even though they carry the responsibility for waste system economics. But it is the most direct route to move today's waste economics from a fragile economic foundation to one that is more robust and can be trusted for investment to come. This is the key linchpin that must be solved to unlock everything else.

EMERGING MODEL FOR SHARING THE BURDEN OF THE TIPPING FEE ACROSS VILLAGE AND REGENCY GOVERNMENTS

Initial testing with local governments of the blended finance model has confirmed the hesitation of committing to a long-term tipping fee. However, a model is emerging in the Banyuwangi regency as part of its Banyuwangi Hijau program, a regency lead waste management effort to serve 1.4m people with waste management service. Developed by Project STOP in partnership with local government leadership, the model introduces a viable tipping fee mechanism for both village and regency governments. Fundamentally, the tipping fee burden is shared between village governments and regency/city governments in a way that mirrors the RCF structure, see Figure 11.

Figure 11: Emerging local government tipping fee model



In this scheme, village governments agree to a service agreement in which they would pay MRF operators a waste processing fee (and a waste collection fee if they do not provide waste collection locally). The combined fee from all villages equals the tipping fee obligation. The village governments would then own the responsibility of collecting the household waste service fees from their community. If they collected a surplus in fees, they keep the extra to top-up their village budgets,

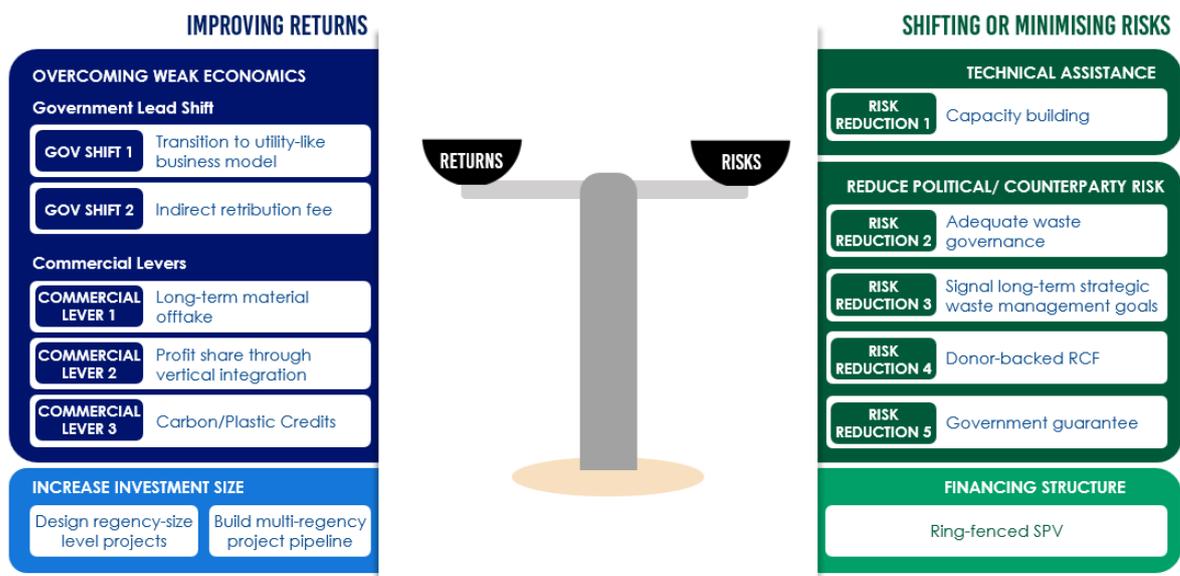
and likewise in the event the collected waste fees were insufficient, village government would need to use their village treasury budget to cover any remaining gap.

Regency and city governments would provide a budget incentive for villages who make the service agreements to support them in covering the gap until they are able to optimise the collection of their waste service fees. The regency and city governments would also take a guarantor role, covering any financial gaps if village governments did not meet their financial obligations. For this to work, waste processing must use a regency governance structure such as BLUD, BUMD or UPTD covered further in section *Adequate waste system governance*.

3.2 CHANGES NEEDED TO OVERCOME WEAK ECONOMICS AND HIGH RISK

In this section we go into more detail about the specific underlying shifts necessary to make the proposed blended finance approach possible.

Figure 12: Strategies to overcome waste system specific financing challenges



IMPROVING RETURNS

Fundamentally, local governments and investors need waste revenue streams to become both sufficient and stable to cover operational costs, and eventually loan repayment. To bridge the gap of de-risking waste projects enough to enable infrastructure investment today while giving both local and national government

time to overcome weak waste economics, we propose several key shifts and operational and commercial levers:

Government-led Shifts	<ol style="list-style-type: none"> 1. Transition waste management towards a utility-like business model like water infrastructure with a service fee 2. Professionalise household and business waste service fee collection (or subsidise with other funding source like extended producer responsibility (EPR))
Commercial Levers	<ol style="list-style-type: none"> 1. Professionalise recycling sales by using long term material purchase agreements to reduce volatility, where possible 2. Share profit from higher margin waste processing through vertical integration 3. Utilise carbon and plastic credits to monetise co-benefits of waste management activities

GOV SHIFT 1 TRANSITION TOWARDS A UTILITY-LIKE BUSINESS MODEL

Commercial lenders and DFIs have used structured financing to fund entities with illiquid assets, but reliable cash flows such as water utilities. One of such examples is the Kigali Bulk Water Supply project in Rwanda in which a private sector operator of the project has a long-term agreement with Rwanda's public water utility WASAC for selling drinking-quality water. **Structured financing has allowed these utility-type businesses to borrow funds by using their service fee commercial contracts security rather than using their physical assets as collateral.**

While there are clear advantages to this type of financing, there are some important practical pre-conditions to be met by the investment project, the most important being sustainable operations and reliable cash flows. By transitioning away from the current waste revenue model which relies on direct cash collection of waste fees towards a service agreement with a creditworthy public entity, the waste system will more closely emulate the business model of a traditional utility, shifting the fee collection responsibility away from the waste operator and firmly repositioning it with the local government. **Linking investment with a service agreement from public entities will ensure commercial risk resides with the public sector, making waste systems far more 'investable' to investors (i.e., a PPP model).** In effect, this means local governments would need to agree to pay a tipping fee to the project developer which would cover the operating costs of the waste system^{xiv}, as well as the repayment of the infrastructure loan.

It is important to note that this transition requires some degree of centralisation. Efficient waste management programs require scale. Waste management around the globe is a low margin, high volume business. Small, individual waste systems are

^{xiv} The service fee would cover waste collection, sortation, material process, safe disposal and overhead operating costs as well as loan repayment.

far more expensive to manage than building a single MRF at the sub-district and managing several facilities from the district level. Consequently, this shift entails the adoption of a centralised approach to waste collection activities within a regency, which incorporates pre-existing community-based primary collection systems into a single governance framework known as BLUD, as elaborated further in section *Adequate waste system governance*.

GOV SHIFT 2

PROFESSIONALISE WASTE SERVICE FEE COLLECTION

The International Solid Waste Association 2022 Paper of the year, "The nine development bands: A conceptual framework and global theory for waste and development", found that countries tend to evolve in similar ways as they professionalise their waste services¹⁵. One of the most important steps a country can take to improve waste collection levels is to secure stable, sufficient waste system funding. With stable funding, stable governance structures start forming and far more professionally managed waste systems develop as well as more investment into waste infrastructure.

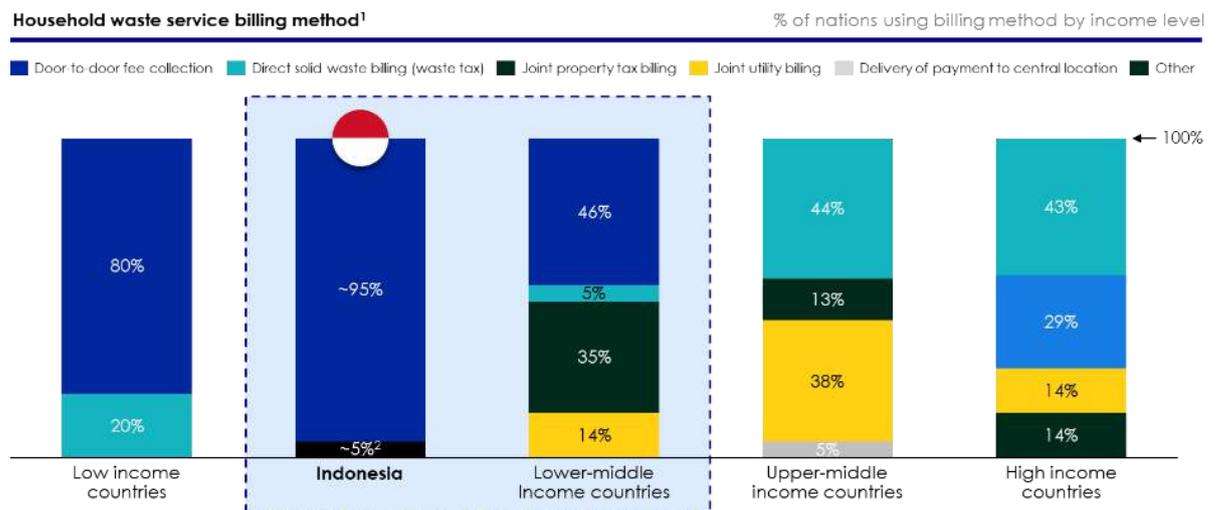
Many countries have gone through the progression of starting with cash payments and evolving towards an "indirect" fee collection model. In fact, there are 15 South American countries and several peer Asian and African nations who bundle their waste fees with other utility bills and/or property tax^{xv}. These approaches are tried and tested and offer numerous advantages over today's manual, volatile cash-based fee collection system^{xvi}. Indonesia's current door-to-door cash-based fee collection system is more aligned with low-income nations, rather than its lower-middle income country peers (Figure 13).

Importantly, both joint utility billing and waste taxes are considered reliable and predictable revenue sources by investors.

^{xv} South American countries using at least one form of 'indirect' fee collection include Venezuela, Argentina, Colombia, Uruguay, Chile, Costa Rica, Belize, Panama, Ecuador, Peru, Bolivia, El Salvador, Guatemala, Honduras and Paraguay. In addition South Africa, Jordan, Ethiopia, Malaysia and Thailand use indirect fee collection.

^{xvi} Even indirect fees need to be properly safeguarded against corruption or use for other functions. It remains critical to safeguard indirect funds through legislation, oversight and processes to ensure they go to the intended use.

Figure 13: Household waste fee collection approach by country socioeconomic status



In Indonesia, there is now growing focus on improving local waste economics. A new legislation issued in January 2021, Permendagri (Ministry of Home Affairs) Regulation No. 7/2021 (MoHA 7/2021) on the Procedures in Calculating Retribution Fees in Waste Handling, is intended to strengthen the contribution of waste service fees as the backbone of the waste system funding. The regulation provides a formula for regencies and cities to calculate the optimal amount to charge households and businesses for waste collection services, based on the ideal cost for waste handling minus government subsidy from the non-retribution waste budget. However, so far implementation has been slow as local governments struggle to introduce much less collect higher fee amounts, and in some cases, any fee at all.

One key challenge is that despite Indonesian citizens having the right to live in a healthy environment (i.e., Environment and Foundation Law UUD 1945), Law 18/2008 classifies government waste services and the corresponding waste fee as optional. Therefore, local governments cannot legally require their constituents to pay the fee.

While an effectively implemented indirect waste service fee collection system would help maximise retribution fee volume, reliability and transparency, waste fees would need to be legally reclassified as a tax instead of a government retribution or fee. The proposed revision of Law No. 18/2008 would further enable national and local government to apply levies or waste tax based on the polluter pay principle. Once this is done, local governments can easily enforce payment and use PPP service fee mechanisms.

The blended finance long-term service agreements could accelerate the need for national government to support local governments to professionalise waste revenue collection so that they will have stable, adequate resources to both operate their waste systems sustainably and service a loan – while also considering additional dependable revenue sources from the private sector, ensuring that waste service fees are affordable to all.

COMMERCIAL LEVER 1

LONG-TERM MATERIAL PURCHASE AGREEMENTS CAN IMPROVE CASHFLOW ROBUSTNESS AND MITIGATE DEMAND

Waste system economics are exposed to recycled material market price volatility. **Long-term offtake agreement helps mitigate off-take risk and ensure the waste system benefits from a stable revenue stream through fixed volume demand and pre-agreed prices.** In addition, long-term purchase agreements **ensure market risk is shared** between the waste collection systems which aggregate the recyclable materials and recycle buyers.

These contractual agreements are foundational mechanisms to help address the growing global unmet demand for recycled materials. While brands are increasingly looking to substitute virgin raw materials and increase recycled feedstock, the current supply of recycled plastic only meets 6% of the demand¹⁶ due to difficulties accessing high-quality recycled materials through reliable and consistent supply chains.

Securing long-term demand for recyclable materials is a key enabling factor to promote activities from the formal and informal waste sectors to collect a wider range of materials within the waste stream. The security that long-term agreements provide will add to the resilience of the upstream collection supply chain necessary to support a thriving circular pathway for all recyclable materials, and not only the high-value materials (i.e., PET, HDPE). Such co-benefits will be instrumental in supporting a thriving ecosystem of waste management entrepreneurs and accelerate the transition towards a fully circular economy.

Besides recycle material, long-term buying agreements can also provide revenue stability for waste operators processing organic waste into fertiliser and compost. Buyers want a guaranteed stable quality and quantity of compost with N, P, K and PH ratios and lack of pollutants while operators benefit from surety of demand.

COMMERCIAL LEVER 2

PROFIT-SHARING FROM MORE PROFITABLE COMPONENTS OF WASTE VALUE CHAIN THROUGH VERTICAL INTEGRATION

Bankable projects can be developed by vertically integrating different elements of the waste value chain. For example, mechanical recycling and other waste processing technologies can be used to make waste collection and sortation services a more financially sustainable investment opportunity. For the mechanical recyclers, vertical integration ensures a greater control over the supply and quality of the feedstock. A reliable and transparent supply chain ensure consistent production quality and can help unlock premium pricing when selling to manufacturers looking for circular raw materials. In addition, if the operation is collocated, vertical integration may lead to lower transportation costs, smaller turnaround times, and simpler logistics. As such vertical integration can help reduce costs and improve returns for recyclers, while ensuring that these additional benefits are redistributed across the value chain for a sustainable operation.

Successful precedents exist in the sanitation sector, where waste to energy technologies have been used to make sanitation services a financially sustainable

business. In Kenya, [Sanivation](#) is developing an integrated city-wide sanitation solution for fecal sludge management. Sanivation offers collection services in the form of portable toilets. Sanivation facilities then treat the fecal sludge, turning it into fuel briquettes, which are then monetised and sold to cover the operational costs of the facility.

**COMMERCIAL
LEVER 3**

**ACCESSING VOLUNTARY CREDIT MARKETS TO HELP MONETISE
CO-BENEFITS OF WASTE MANAGEMENT ACTIVITIES**

Carbon credit and plastic credit markets provide another avenue to monetise waste management ecosystem services. Projects that generate carbon credits can be verified and sold to the voluntary market. For instance, [Yayasan Bumi Sasmaya](#), an NGO based in Indonesia, runs a waste recovery project in Gianyar Region, Bali, Indonesia. Their facility reduces GHG through composting organic waste and claims benefit from the sale of carbon credits.

More recently, plastic credits have emerged as a novel financial mechanism to channel private funding into plastic waste collection and recycling projects. For example, [rePurpose](#), a US-based waste management organisation, engaged in plastic recovery activities, has financed multiple projects through the sale of plastic credits to domestic and international off-takers.

SHIFTING OR MINIMISING RISK

While the proposed blended finance model offers a solution to improving returns through a fundamental shift in the circular waste management business model; to unlock the flow of capital towards circular waste systems it also needs to address the risks that have traditionally hampered commercial and concessional capital in

the sector. We propose five blended finance instruments to minimise risks and create acceptable risk-return profiles for investors:

Risk reduction measures	<ol style="list-style-type: none">1. Reduce operational risks through grant funded technical assistance to support project preparation and government capacity building2. Reduce credit and political risks through adequate waste system governance system, independent from local political dynamics3. Governments to reduce policy and regulatory risks by implementing long-term strategic waste management goals4. Use a revolving credit facility (RCF) to successfully address waste system credit risks and support OP EX constraints giving local governments several years to professionalise waste service fee collection5. Reduce counterparty risks through guarantee
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RISK REDUCTION 1

CAPACITY BUILDING THROUGH TECHNICAL ASSISTANCE

Development funding can be used for technical assistance to provide targeted support in the form of consulting services and capacity building throughout waste projects, and thus enhance the project implementation success and the resulting investment performance. Beyond project development, technical assistance is also important to improve risk management throughout the project life cycle, allowing knowledge gaps to be addressed and new waste systems to be developed and technically accompanied by government, waste management, and behaviour change experts.

This technical assistance can be either directly incorporated within the blended finance facility or operate as a separate entity. For instance, Project STOP, an initiative cofounded by Borealis and Systemiq, partners with local governments to create economically sustainable, circular waste management systems through comprehensive, hands-on technical assistance. Project STOP uses a holistic, “system enabler” approach by embedding a team of waste management experts to help local governments during project preparation (such as exploration and feasibility studies), project design, operational assistance, capacity building and knowledge transfer. Most importantly, by promoting the adoption of best practices in waste management and developing appropriate policies and regulations, technical assistance can enhance the quality of service delivery and ensure the communities served enjoy adequate and affordable waste management services. **This holistic approach helps mitigate several key project implementation risks (Figure 14) and has led to substantial benefits, including greater project ownership by local stakeholders, improved economic performance, and enhanced local knowledge and capacity.**

Figure 14: Project STOP adopts a “system enabler” approach to technical assistance by offering end to end support to local governments across multiple discipline through-out the project preparation and implementation phases, mitigating key project development and implementation risks

Risks	Design	Construction	Implementation	Handover
Political & Regulatory Risk	Permits		Tariff regulation	
	Gvmt approval timeline		Other regulation	
	Political instability (Change in Bupati / Governor / President)			
	Corruption			
	International environmental standards			
	Risk of delays in government fiscal support (incentives, subsidies, etc.)			
Macroeconomic & Business Risk	Funding availability	Revenue volatility		
	Prefunding availability (TA)	Social acceptance		
			Counterparty risk	Asset replacement
	Currency risk			
	Inflation			
	Interest rate			
Technical Risk	Land availability	Construction challenges	Project management failure	Local operational capability
	Material price		Qualitative deficit in service	Gvmt oversight capability
	Technology obsolescence			

Risk mitigated by Project STOP system enabler technical assistance approach

RISK REDUCTION 2

ADEQUATE WASTE MANAGEMENT GOVERNANCE SYSTEM

Good governance is a pre-requisite for system change and one of the most important levers for system sustainability. By firmly establishing the regency government as the main contractual counterpart in a Public Private Partnership (“PPP”) transaction, it is imperative for regency and city governments to set-up a transparent and independent institutional waste governance system. Such waste governance systems should have the authority to coordinate waste operations across its jurisdiction and be able to manage waste system funds independently with a separate bank account from other government revenue with transparent financial bookkeeping to reliably track waste service fee collected and transferred, material sales, government subsidies and other funding.

Indonesia has several regency/city government’s environmental agency structures available for managing waste systems. Out of the available structures, **the ring-fenced, and project-specific nature of BLUD/BUMD (two local government-owned enterprise structures) make them a natural fit for infrastructure partnerships.** The BLUD governance structures is already widespread in the public health sector, as they are a preferred structures for hospitals with over half of Indonesia’s regional general hospitals already having adopted BLUD system¹⁷. BLUD system offers public hospitals the flexibility to adjust employee remuneration, manage its own procurement system, make investments, and independently set service tariff rates – all features valuable to waste operations as well. Several regencies have recognised the benefits of BLUD systems and are taking active steps towards establishing their own. A noteworthy example is the Banyuwangi regency which is making significant progress in setting up a BLUD for waste management with the assistance of Project STOP, as part of the Banyuwangi Hijau program. This pioneering effort is anticipated

to come to fruition in 2023 and is expected to serve as a model for other regencies seeking to enhance their waste management capabilities.

Core governance activities will generally not be financed by private capital so local governments should also ensure sufficient public finances are available for waste governance activities such as monitoring and enforcement. Steps to ensure adequate long-term funding include the revision of **the implementing regulations under the Law No. 23/2014** to ensure that those regulations are reflecting the categorisation of waste management as a mandatory basic service. In addition, a full understanding among national and local stakeholders is also key to secure adequate long-term funding into the waste system.

Furthermore, peer countries have demonstrated that targeted regulation can improve accountability and effective monitoring. For example, in the Philippines, a country with 69% waste handling coverage¹⁸, a legal accountability mechanism, the Anti-Red Tape Act, was established to ensure citizens can keep government officials accountable to deliver public services, including waste management.

These far-reaching policy changes will also allow for more effective enforcement of the existing waste regulations and firmly establish the Regency government as the ultimate authority in waste management within its jurisdiction.

**RISK
REDUCTION 3**

DEMONSTRATING CLEAR LONG-TERM STRATEGIC GOALS FOR WASTE MANAGEMENT AND GOVERNMENT RECEPTIVENESS TO INVESTMENT WILL CREATE AN ENABLING ENVIRONMENT

The regency/city local governments can demonstrate that waste management is a strategic priority by developing a solid waste management master plan. Local governments can ensure long-term waste targets are embedded within the plan, and it can clearly outline existing funding and capacities while identifying areas of needs and collaboration with commercial investors, including funding. If this exists, it is something that is attractive to financiers (private and non-private parties). This demonstrable long-term commitment to waste management will signal to investors that this is a long-term opportunity and reassure them against unexpected policy changes.

**RISK
REDUCTION 4**

USE A REVOLVING CREDIT FACILITY TO SUCCESSFULLY ADDRESS WASTE SYSTEM SHORT-TERM CREDIT RISKS AND LONG PAYBACK

As a way to provide a safety net and more time for local governments to facilitate their transition towards a utility-like business model, a revolving credit facility can be made available to cover any remaining liquidity gap to meet service fee obligations. A revolving credit facility is a temporary support mechanism which addresses the short-term payment uncertainty that waste infrastructure often faces due to the uncertainty of revenue streams (i.e., waste service fees and sale of materials) during the transition of professionalising waste revenue collection. As

policy changes and new waste fee collection mechanism materialise, the risk of the RCF to be called upon diminishes over time.

During a 'Sustainable Waste Blended Financing' workshop held in October 2022 by the Coordinating Ministry of Maritime Affairs and Investment, representatives from the National Development Planning Agency (BAPPENAS) have confirmed that such Revolving Credit Facilities from commercial banks are accessible for improving waste system economics, as long as the underlying waste system has a robust business revenue model, further highlighting the need for an accelerated transition towards a utilities-type business model. BAPPENAS has also shown that such mechanisms are commonly used in other infrastructure sector to catalyse investment.

Examples of similar credit enhancement instruments exists: For example, the Asian Development Bank launched the [Pacific Renewable Energy Program](#), a USD100 million facility which provides financing support including letters of credit to overcome constraints to private sector investment in renewable power projects in Pacific Island countries. The Letter of Credit is a facility drawable by the project company to cover short-term liquidity and helps it overcome uncertainties related to power purchase agreements, foreign currency availability and convertibility, and perceived political risks.

Likewise in the Philippines, a revolving fund has been used to help mobilise domestic commercial financing for water utilities through the [Philippine Water Revolving Fund \(PWRP\)](#). The revolving fund provided a standby credit line to private finance institutions to cover the liquidity risk and refinance private bank loans if necessary. In this way the liquidity enhancement allowed the PWRP to extend longer loans in line with utilities requirements.

RISK REDUCTION 5

REDUCE COUNTERPARTY RISK THROUGH GUARANTEES

Guarantees, including credit, offtake and political risk guarantees, are effective tools to mobilise commercial investment in the utilities.

To mitigate government-related financial risk, the Indonesian government has established several facilities to support infrastructure development under Blended Finance schemes such as the Project Development Facility, Viability Gap Fund, government guarantees and regulatory support in procurement and land acquisition. The government also provides availability payment mechanism that give investment repayment certainty for private investors.

The government provides guarantee assistance through the Indonesia Infrastructure Guarantee Fund (IIGF), established in 2009. IIGF acts as a guarantor for infrastructure risks related to government inaction that could result in financial losses for PPP infrastructure projects.

Counterparty risk can also be mitigated if financing flows through the National Government of Indonesia, who will then become the main borrower and pass down

the funding to the regional governments as grantees. This would require the projects to be on priority infrastructure list.



4. CONCLUSION AND RECOMMENDATIONS

4. CONCLUSION AND RECOMMENDATIONS

Indonesian's foundation law states:

“Everyone has the right to live in physical and spiritual prosperity, to have a place to live, and to have a good and healthy living environment, as well as the right to obtain health services”¹⁹.

However, as we reflect on the state of waste management in Indonesia, we can conclude that clear next steps must happen for all Indonesian citizens to have a good and healthy environment via access to adequate waste management services. Waste collection is foundational for a well-functioning waste management system and contributes to a range of SDGs, including improved health, biodiversity, gender equality, food security, and climate adaptation while supporting underserved communities.

Despite rising interest and demand for waste projects from development finance institutions and impact investors, they have struggled to find opportunities that match their minimum risk-return thresholds. This study shows that this risk-return mismatch can be overcome with a combination of professionalising revenue sources, ensuring adequate governance and policy changes, and targeted deployment of concessional capital through a tailored blended finance solution. This blended finance model offers a pathway into beyond-grant models and helps build local circular markets.

Bridging the USD4 billion funding gap and mobilising capital for waste systems in Indonesia, will only be achieved through collaboration from a wide range of actors from public, private and philanthropic sectors. We set out in the table below targeted recommendations for each stakeholder to enable this system change.

System change enablers	
National Government <i>Send clear signals to investors about explicit government endorsement of waste infrastructure investment through target</i>	<ul style="list-style-type: none">• Make waste management a national strategic priority, ensuring waste management targets are embedded in the national plan, and listed in a registry of investment priority projects (Blue and Green book^{xvii}) to signal to investors the explicit support of the national government towards all waste management investments in Indonesia• Improve waste regulation including:<ul style="list-style-type: none">○ Prioritise indirect waste fee collection through waste tax and/or joint utility bill to ensure stable, sufficient local waste system revenue

^{xvii} The Blue Book, which contains all the projects for foreign- assisted funding under the national government's Medium-Term Development Plan (RPJMN), and the Green Book, which confirms the readiness of the projects in a given year that can proceed to loan negotiations.

<p><i>regulation and sovereign guarantees</i></p>	<ul style="list-style-type: none"> ○ Ensure waste services are categorised as Mandatory spending under local government budgets to create a better enabling environment and thereby improve the creditworthiness of waste projects and businesses ○ Channel additional private sector funding into waste collection and sortation through mandatory EPR and plastic excise tax ○ Include waste as part of local government's minimum service standard (SPM/Standar Pelayanan Minimum), to push local government to prioritize waste budget ● Facilitate local waste governance activities such as solid waste master planning, monitoring and enforcement, and financial support ● Provide sovereign guarantees for revolving credit facility, expand sovereign funding opportunities by leveraging DFI and Philanthropic support
<p>Local Governments <i>Send clear signals to investors about favourable investment environment through long-term solid waste master planning on strong waste governance system</i></p>	<ul style="list-style-type: none"> ● Make waste management a local strategic priority and ensure waste management targets are embedded in local laws on midterm (5 years strategic plan) and long-term development planning (25 years strategic plan) – which refer to solid waste master plan – to signal to investors long-term commitment towards waste management ● Embrace the transition towards professionalisation of waste service fee collection, either through joint utilities billing or through a waste levy/tax ● Establish independent and ring-fenced waste system governance system (i.e., BLUD or BUMD) ● Actively conduct local waste governance activities such as monitoring, professionalising waste service operations, and enforcement of existing waste regulations ● Bring in sector expertise to improve the efficiency of waste infrastructure operations and build local government capacity and knowledge ● Align on loan repayment structure that will work for all parties include familiarisation of broad tipping fee models as a traditional government-private sector cooperation mechanism
<p>Concessional Capital Providers</p>	
<p>Sovereign Institutions <i>Support governments and deploy concessional capital in a</i></p>	<ul style="list-style-type: none"> ● Provide technical assistance to national and local government, building capacity in key areas such as waste governance and technical capacity to create the enabling environment necessary for the development of a robust waste management investment pipeline

<p><i>catalytical way to de-risk waste investment</i></p>	<ul style="list-style-type: none"> • Mandate Development Finance Institutions to set investment targets for waste management projects • Scale the use of de-risking instruments like guarantees for investment in the waste sector to help overcome key barriers
<p>Development Finance Institutions (DFIs) <i>Support national government in policy making and deploy its concessional funding through guarantees and other instruments to mobilise funding towards waste management infrastructure</i></p>	<ul style="list-style-type: none"> • Provide concessional loans for waste management investments, and partner with other capital providers in a synergistic way • Support national policy to make waste management a national strategic priority • Provide guarantees for waste management investments, specifically for revolving credit facilities to help overcome key barriers of long payback periods and perceived credit risks • Align existing investment strategies with Sustainable Development Goals for waste management based on an improved understanding of the direct and indirect co-benefits of adequate waste management
<p>Philanthropic funders <i>Use philanthropic capital to build capacity at local level and trial new de-risking solutions to break the barriers which currently prevent investment in the waste sector</i></p>	<ul style="list-style-type: none"> • Fund technical assistance for local stakeholders, including financing feasibility and development studies that provide the foundational knowledge for strategic commercial capital investment and support project pipeline development • Provide guarantees for waste management investments, specifically for revolving credit facilities to help overcome key barriers of long payback periods and perceived credit risks • Partner with local governments to improve their understanding of waste management businesses and help them distinguish between real and perceived risks • Support and scale-up innovative technologies and business models in waste management
<p>Commercial Capital Providers and Private Sector</p>	
<p>Commercial Investors <i>Provide expertise to structure de-risking mechanisms and scale sovereign financing for infrastructure projects</i></p>	<ul style="list-style-type: none"> • Provide expertise in finance structuring for waste investment, specifically for the revolving credit facilities • Provide sovereign and sub-sovereign financing for waste management infrastructure to facilitate de-risking through guarantees and insurance mechanism
<p>Private Sectors</p>	<ul style="list-style-type: none"> • Invest throughout the waste value chain to enable cross-subsidisation of upstream projects

<p><i>Explore innovative ways to structure ring-fenced waste management projects and bundle investments to achieve scale</i></p>	<ul style="list-style-type: none"> • Participate in the design and implementation of blended finance structures for waste infrastructure investment such as blended finance funds, to allow for risk diversification • Support the development of waste infrastructure investment pipeline by providing financial and structuring expertise
<p>Project developers <i>Strengthen partnerships to ensure bankable solutions</i></p>	<ul style="list-style-type: none"> • Bring in private sector and technical assistance expertise early on to design and implement bankable solutions • Build strong relationship with local and national government • Develop projects with scalability in mind • Cooperate with local financial institutions to leverage existing infrastructure financing facilities • Improve understanding of development financing, including development impact metrics and reporting requirements

This is a first attempt at a blended finance structure designed to address the challenge of the lack of investable circular waste collection and sortation projects in Indonesia. The model was built on the back of feedback received from a wide selection of stakeholders involved in infrastructure financing as well as waste operations with the hope of providing the basis for an open and productive exchange of ideas. Ultimately the aim is for this model to be trialled in a pilot program by a couple local governments to serve as a proof point for waste systems across the country, and if successful serve as a model to bring further waste system infrastructure financing to serve the 3 billion people globally without access to waste management.

GLOSSARY

- Banyuwangi Hijau** : A 'fight waste pollution' program launched by the Banyuwangi regency government and supported by Project STOP co-founder Borealis and Systemiq as the continuation and expansion of Project STOP Muncar. This program is aimed towards implementing concrete actions to fight waste pollution in the Banyuwangi regency.
- Bersih Indonesia** : A 'fight plastic pollution' program launched by Malang regency government, in collaboration with the Coordinating Ministry for Maritime and Investment Affairs (CMMIA), and the Alliance to End Plastic Waste (AEPW).
- Blended finance** : A framework that combines concessional finance from donors or third parties alongside DFIs' normal own account finance and/or commercial finance from other investors, to develop private sector markets, address the Sustainable Development Goals (SDGs), and mobilise private resources²⁰.
- Commercial bank** : A financial institution whose purpose is to accept deposits from people and provide loans and other facilities. Commercial banks provide basic services of banking to their customers (the public) and small to medium-sized businesses²¹.
- Concessional capital** : Below market rate finance provided by major financial institutions, such as DFIs and multilateral funds, to developing countries to accelerate development objectives. The term concessional finance does not represent a single mechanism or type of financial support but comprises a range of below market rate products used to accelerate a climate or development objective²².
- DFI (Development Financing Institution)** : Specialised development banks or subsidiaries set up to support private sector development in developing countries. They are usually majority-owned by national governments and source their capital from national or international development funds or benefit from government guarantees²³.
- EPC (Engineering, Procurement, and Construction) Company** : A company that delivers a complete package of resources to complete an infrastructure project, from project design, procurement of materials, construction, and commissioning. An EPC company typically provides a single responsible source for executing a project, thus alleviating risk for the project owner.
- Government guarantee (in Indonesia context)** : A guarantee issued by the Government of Indonesia through Indonesia Infrastructure Guarantee Fund (IIGF) to private sector for any infrastructure risk arisen as the result of any government action or inaction which may result in monetary loss for the infrastructure project, e.g., delay in license and permit issuance, change in regulation, failure of tariff adjustment, failure of network/facility integration, and other risks covered or allocated to the government in the PPP contract. For the government as the project owner, IIGF guarantee could improve the certainty of private sector participation and financing for infrastructure development in Indonesia. For private sector, IIGF guarantee can reduce

exposure to political risk in the eyes of investors and creditors therefore would lower cost of financing associated with the investment for infrastructure projects²⁴.

- Indirect fee** : In the waste management context, indirect fee is defined as the collection of waste fee through any indirect channel, e.g., joint utility bill or waste tax.
- Joint utility bill** : Embedding the waste fee into any utility bill collection (e.g., electricity, water) to improve fee collection performance.
- Material sales** : Sales of valuable materials sorted or scrapped from the municipal waste (e.g., metals, plastics, glasses).
- ODA (Official Development Assistance)** : Government aid that promotes and specifically targets the economic development and welfare of developing countries²⁵.
- O&M (Operation and Maintenance)** : Activities associated with daily operation of an infrastructure project, which covers operation and regular infrastructure maintenance.
- OPEX support facility** : A financial instrument put in place for supporting the amount of OPEX needed to operate an infrastructure project, in an event of inadequate funding for covering the total OPEX needed. An OPEX support facility works as a stand-by loan and could be in a form of a Revolving Credit Facility or others.
- PPI (Private Participation in Infrastructure Projects)** : The PPI is a product of the World Bank's Public Private Partnership Group, aimed to identify and disseminate information on private participation in infrastructure projects in low- and middle-income countries. The database highlights the contractual arrangements used to attract private investment, the sources and destination of investment flows, and information on the main investors²⁶.
- RCF (Revolving Credit Facility)** : A form of credit issued by a financial institution that provides the borrower with the ability to draw down or withdraw, repay, and withdraw again. An RCF is considered a flexible financing tool due to its repayment and re-borrowing accommodations. It is not considered a term loan because, during an allotted period, the facility allows the borrower to repay the loan or take it out again²⁷.
- Waste Service fee / Retribution fee** : Payment for special/public services (e.g., waste management service) provided by the regency government and/or the waste management operator. The waste service fee is paid by household to the regency government and/or waste management operator, according to the waste management business model in the service area. For the analysis set-out in this report, the waste service fee covers the cost of upstream waste management (waste collection, treatment, and transfer to disposal site) and excludes disposal costs (i.e. landfilling, WTE, or other)
- Tipping fee (in this conceptual blended finance context)** : A fee paid by the regency government to the SPV for the benefit of waste management services delivered by the SPV and is based on the weight of the waste per ton. This service fee model has similarity to the pre-agreed O&M fee model paid by project owner to an SPV for running the infrastructure project daily.

- SPV (Special Purpose Vehicle)** : A ring-fenced legal entity set up in local context, dedicated for managing finances of the waste system in local context. The SPV can choose to sub-contract part of the work to different third parties, e.g., sub-contracting the engineering and construction to one party (i.e., EPC company), then sub-contracting the operation to another party (i.e., O&M).
- Utility-like business model** : A business model replicating the success from other utilities business (e.g., electricity, water) by which the regulated entity (e.g., electricity/water utility company) recover their cost and earn return through rates charged to their customers. This way, the utility company have a certain and predictable revenue source.
- Waste collection and sortation system** : A system where waste is collected door-to-door from households and businesses, then separated into different elements. This is the upstream part of waste management system, where a proper waste collection and sortation system could potentially reduce the amount of waste going into the landfill.
- Waste handling** : A holistic effort to manage the municipal waste, which covers waste collection, sortation, recycling, repurpose, recovery, and disposal to landfill.

SOURCES

- 1 NPAP (2020), Radically Reducing Plastic Pollution in Indonesia: A Multistakeholder Action Plan, <https://weforum.ent.box.com/s/3dx0h6h3iyab847msnx7iw62kjt5myu>
- 2 NPAP (2020), Financing System Change to Radically Reduce Plastic Pollution in Indonesia: A Financing Roadmap, <https://globalplasticaction.org/wp-content/uploads/NPAP-Indonesia-Financing-Roadmap.pdf>
- 3 Badan Pusat Statistik (BPS) Indonesia (2020), Statistik Lingkungan Hidup Indonesia. Jakarta, Indonesia: Badan Pusat Statistik, <https://www.bps.go.id/publication/2020/11/27/5a798b6b8a86079696540452/statistik-lingkungan-hidup-indonesia-2020.html>
- 4 Ritchie, H., Roser, M. (2020), CO₂ and Greenhouse Gas Emission, <https://ourworldindata.org/co2-and-other-greenhouse-gas-emissions>
- 5 Systemiq (2021), Building Robust Governance and Securing Sufficient Funding To Achieve Indonesia's Waste Management Targets, https://www.systemiq.earth/wp-content/uploads/2021/11/Building-Robust-Waste-System-Governance-and-Securing-Sufficient-Funding_Final-Report_26Nov2021.pdf
- 6 OECD (2022), QWIDS Database, <https://stats.oecd.org/qwids> (accessed November 2022)
- 7 World Bank (2022), PPI Database, <https://ppi.worldbank.org> (accessed November 2022)
- 8 Presidential Regulation Number 97 in 2017 on the National Waste Management Policy and Strategy (Jakstranas) for the Management of Household Waste and Household-like Waste
- 9 Kaza, S., Yao, L., Bhada-Tata, P., Van Woerden, F. (2018) What a Waste 2.0: A global snapshot of solid waste management to 2050, <https://openknowledge.worldbank.org/handle/10986/30317>
- 10 OECD (2017), OECD DAC Blended Finance Principles for Unlocking Commercial Finance for the Sustainable Development Goals, www.oecd.org/dac/financing-sustainabledevelopment/development-finance-topics/OECDBlended-Finance-Principles.pdf
- 11 Beaumont et al., (2019) Global ecological, social and economic impacts of marine plastic, <https://www.sciencedirect.com/science/article/pii/S0025326X19302061>
- 12 KPPIP, (2022) 2021 Semester 2 Report, Investment Package for National Priority Infrastructure Projects, which includes 7 priority sectors including Waste Management https://kppip.go.id/wp-content/uploads/filebase/laporan_semester_kppip/Laporan_KPPIP_semester_2_2021.pdf
- 13 Wilson, D., Rodic, L., Scheinber, A., Velis, C., & Alabaster, G. (2012), "Comparative analysis of solid waste management in 20 cities". <https://journals.sagepub.com/doi/full/10.1177/0734242X12437569>

-
- 14 BPS Jawa Timur and Jawa Tengah (2020), Average wage per month of formal worker in East Java and Central Java <https://jatim.bps.go.id/statictable/2021/09/04/2202/rata-rata-upah-gaji-bersih-sebulan-pekerja-formal-menurut-kabupaten-kota-dan-lapangan-pekerjaan-utama-rupiah-2020.html> <https://jateng.bps.go.id/indicator/6/1871/1/average-wages-of-workers-employees-employees-by-regency-city-and-area-of-residence-in-jawa-tengah.html> (accessed on January 2023)
 - 15 Whiteman, A., Webster, M. & Wilson, D. (2021), "The nine development bands: A conceptual framework and global theory for waste and development". Vol 39.10 <https://journals.sagepub.com/doi/10.1177/0734242X211035926>
 - 16 Closed Loop Partners (2020) Closed Loop Partners Releases Data Visualization Tool That Shows Significant Opportunity to Recapture Valuable Plastic Waste in the U.S. and Canada, <https://www.closedlooppartners.com/closed-loop-partners-releases-data-visualization-tool-that-shows-significant-opportunity-to-recapture-valuable-plastic-waste-in-the-u-s-and-canada/>
 - 17 Ministry of Home Affairs (2022), Presentation of Director of BUMD, BLUD & BMD of Directorate General Regional Finance, Ministry of Home Affairs at National Coordination Meeting on Regional Finance of MOHA, Jakarta, 2nd June of 2022 <https://keuda.kemendagri.go.id/pages/view/199-rapat-koordinasi-nasional-keuangan-daerah-2022>
 - 18 D-Waste, Waste Atlas, <http://www.atlas.d-waste.com/> (accessed on January 2023)
 - 19 Indonesian Constitution (1945), Article 28H paragraph (1) <https://www.mkri.id/public/content/infoumum/regulation/pdf/uud45%20eng.pdf>
 - 20 Ministry of Finance (2017), DFI Working Group on Blended Concessional Finance for Private Sector Projects, <https://kpbu.kemenkeu.go.id/read/1130-1294/umum/kajian-opini-publik/blended-finance-antara-manfaat-dan-tantangan-dalam-penerapannya> (accessed on November 2022)
 - 21 The Economic Times (2022), <https://economictimes.indiatimes.com/definition/commercial-bank>, (accessed on November 2022)
 - 22 The World Bank (2021), What You Need to Know About Concessional Finance for Climate Action, <https://www.worldbank.org/en/news/feature/2021/09/16/what-you-need-to-know-about-concessional-finance-for-climate-action> (accessed on November 2022)
 - 23 OECD (2022), Development Finance Institutions and Private Sector Development, <https://www.oecd.org/development/development-finance-institutions-private-sector-development.htm> (accessed on November 2022)
 - 24 IIGF (2022), Guarantee Overview – The Increasing Demand for Infrastructure Development to Support Indonesia's Economic Growth, <https://ptpii.co.id/ppp-guarantee> (accessed on November 2022)
 - 25 OECD (2022), Official Development Assistance, <https://www.oecd.org/dac/financing-sustainable->

-
- [development/development-finance-standards/official-development-assistance.htm](#) (accessed on November 2022)
- 26 The World Bank (2022) About Private Infrastructure Project Database <https://ppi.worldbank.org/en/about-us/about-ppi>, (accessed on November 2022)
- 27 Investopedia (2021), Revolving Loan Facility Explained – How Does It Work?, <https://www.investopedia.com/terms/r/revolving-loan-facility.asp> (accessed on November 2022)