



Sustainable Packaging

TACKLING PLASTIC WASTE IN ASIA

Commissioned by:



Research by:

alphaBeta
strategy x economics



About Food Industry Asia

Food Industry Asia (FIA) is a non-profit organisation that was formed in 2010 to enable major food manufacturers to speak with one voice on complex issues such as health & nutrition, food safety and the harmonisation of standards. From its base in Singapore, FIA seeks to enhance the industry's role as a trusted partner and collaborator in the development of science-based policy throughout Asia. To do so means acting as a knowledge hub for Asia's national industry associations and affiliated groups, to support with their engagement of public bodies and other stakeholders across the region.

Vision

To be a trusted partner for businesses and governments – building a vibrant food & beverage (F&B) industry for a healthy and prosperous Asia.

Mission

To represent the food and beverage industry in Asia – promoting a climate for sustainable growth and serving as a regional knowledge hub for science-based advocacy.



αlphaβeta

AlphaBeta is a strategy and economic advisory business serving clients across Australia and Asia from offices in Singapore, Sydney, Canberra and Melbourne. Our team of advisors are experts in both strategy and economics who partner with clients from the private, public, and not-for-profit sectors to identify the forces shaping their markets and develop practical plans to create prosperity and wellbeing.

Mission

To integrate strategy and economics to solve the most important business and societal challenges.

www.alphabeta.com



FOREWORD

“

The global growth in municipal solid waste (MSW), including packaging waste, is a serious side effect of the twin forces of urbanisation and economic development. In 2012, the World Bank estimated that the world's cities generated 1.3 billion tonnes of solid waste, around double the amount from 10 years earlier.

”

By 2025, this is expected to reach 2.2 billion tonnes. ¹ This rapid increase is challenging the ability of local and national governments to manage waste effectively. Most of this growth is taking place in developing countries – over 90 percent of the MSW volume increase to 2025 will occur in low- and middle-income countries.²

Plastic waste is particularly challenging. The development of plastics over the last 80 years has led to a revolution in packaging and consumer goods and enhanced convenience for billions of people. Yet a massive amount of plastic has leaked out into our environment. An estimated 8 million metric tonnes of plastics enter the oceans of the world annually. ³ With the rapid expansion in the size of the consumer class, the quantity of plastic marine debris could accelerate quickly. In less than 10 years, there could be 250 million tonnes of plastic in the oceans. ⁴

Once in the marine environment, plastics harm marine animals and ingestion has been shown to inhibit growth, make them more prone to tumour development, less successful in reproduction, and less able to detect and evade predators. Asia is at the heart of the challenge due to its fast pace of development, its lack of collection systems, and the large number of archipelagos (enabling waste to escape more easily into the ocean). More than half of the plastic leakage into the ocean occurs in Asia.

The food industry is a key part of the plastics value chain, and while many of Food Industry Asia's (FIA) individual members are actively pursuing initiatives to address plastic waste in the ocean, there are benefits from the food industry coming together with other stakeholders to create large-scale impact on

plastic waste. In January 2018, FIA created a sustainable packaging initiative to find ways in which the food industry can collaborate with other stakeholders on the issue in Asia. A crucial starting point in this journey is ensuring a strong fact base on the nature of the problem and the possible solutions. Much of this information is still missing in many key Asian markets, and so FIA decided to focus on addressing these gaps in Indonesia, the Philippines, Thailand, and Vietnam which collectively account for close to a quarter of all plastic marine litter.

This report aims to provide some hard evidence on the nature of the plastic waste problem, the solutions currently being deployed, and where the most promising channels exist for impact at scale. We hope that this information helps

to provide new insights into how we can all collaborate to significantly tackle the issue. Dialogues among stakeholders is key, and FIA will work with National Industry Associations, regulators, stakeholders across the plastics and solid waste value chain, and Non-government Organisations (NGOs) to create platforms for constructive discussions leading to concrete steps to addressing post-consumption plastics and packaging waste issues. We look forward to continuing the discussion with interested and like-minded partners.

¹ Daniel Hoornweg and Perinaz Bhada-Tata (2012), "What a Waste: A Global Review of Solid Waste Management". Urban Development Series Knowledge Papers No. 15.

² McKinsey Centre for Business and Environment and Ocean Conservancy (2015), Stemming the Tide: Land-based strategies for a plastic-free ocean.

³ Jenna R. Jambeck et al (2015), "Plastic waste inputs from land into the ocean," Science, vol. 347, no. 6223, pp. 768–771.

⁴ McKinsey Centre for Business and Environment and Ocean Conservancy (2015), Stemming the Tide: Land-based strategies for a plastic-free ocean.

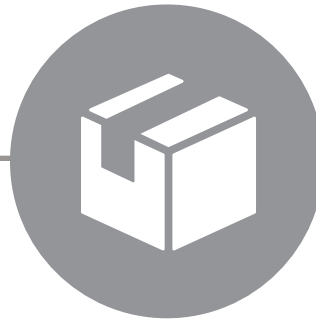
BACKGROUND CONTEXT

In February 2018, FIA commissioned a study on tackling plastics & packaging waste



SUSTAINABLE PACKAGING IS BECOMING A CRITICAL CONCERN IN ASIA

Currently, more than half of plastic leakage waste occurs in Asia driven by rising urbanisation and inadequate collection facilities.

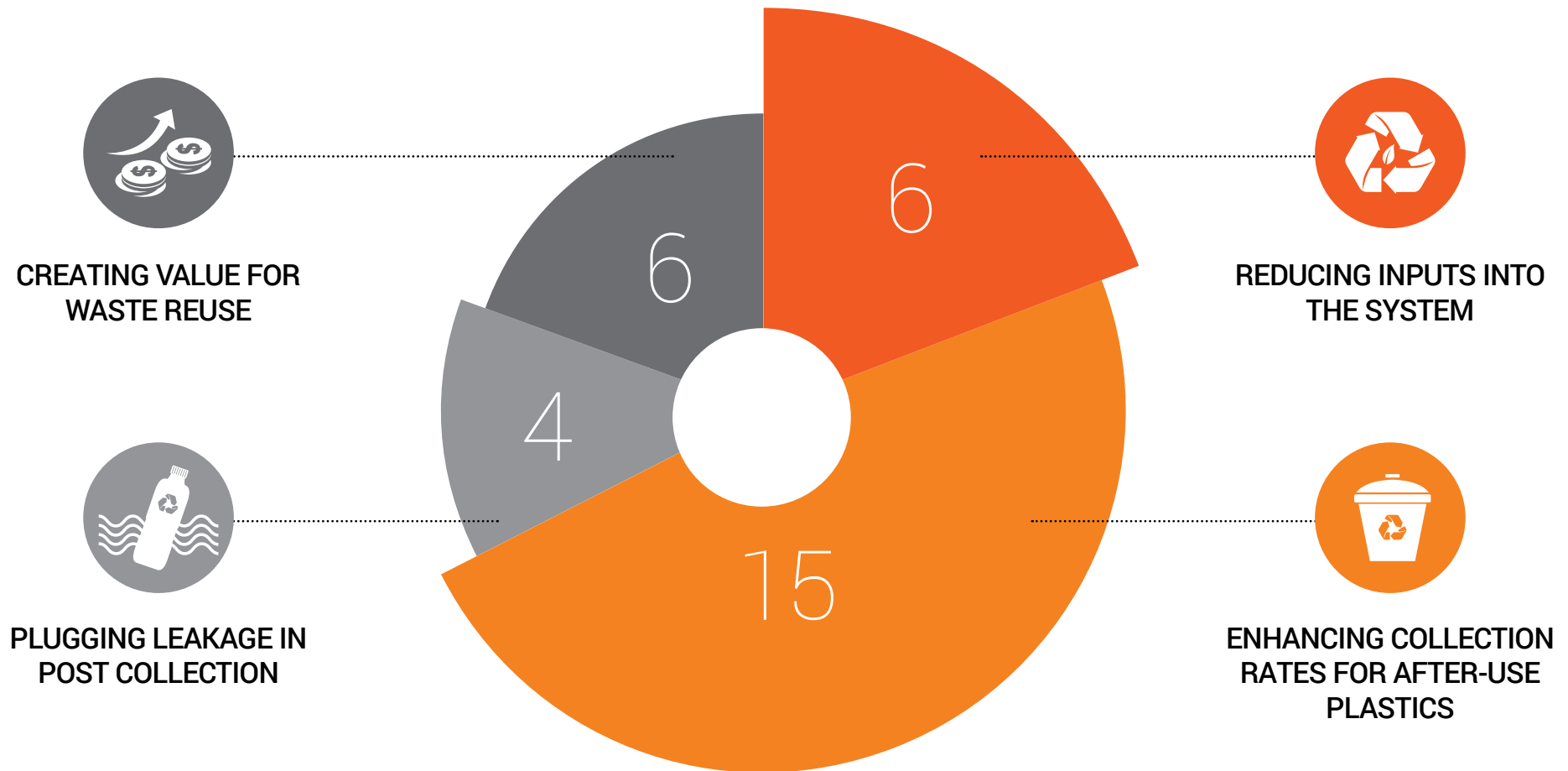


FIA'S RESEARCH AIMS TO ADDRESS A MISSING FACT BASE RELATED TO PLASTIC WASTE ISSUES IN ASIA

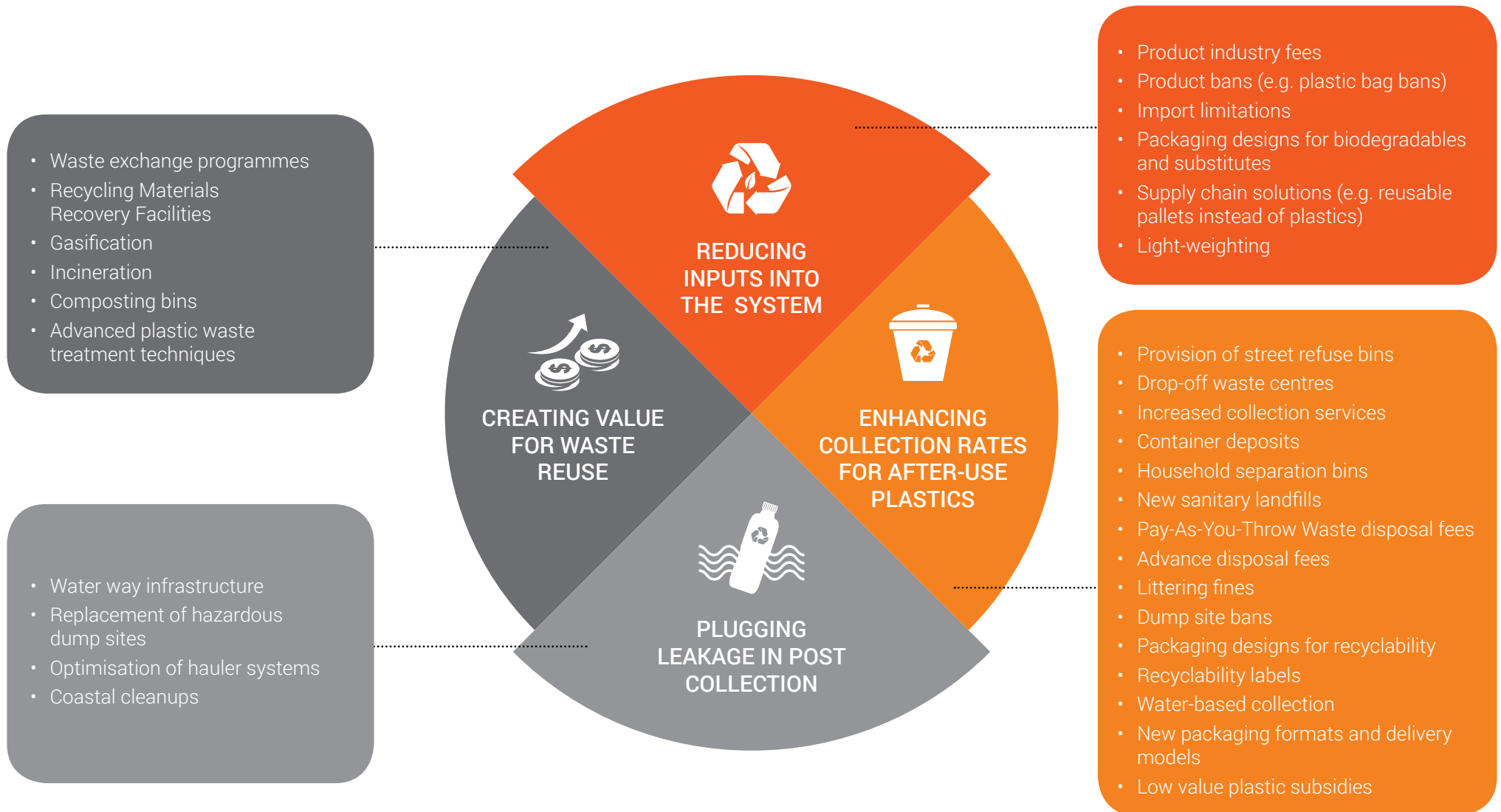
This research addresses three core questions:

1. What are the waste issues in these countries?
2. What are the current efforts to tackle plastic waste in these countries?
3. What are the opportunities for achieving large-scale reduction in plastic waste leakage?

OUR ANALYSIS IDENTIFIED A TOTAL OF **31 POTENTIAL** LEVERS TO SUPPORT SUSTAINABLE PACKAGING IN **4 AREAS**



OVERVIEW OF THE LEVERS

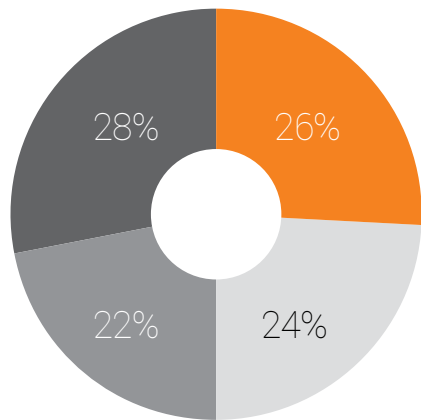


NOTE: These levers consist of the “What to do” rather than the “How to do” initiatives. Examples of the “How to do” initiatives include educational campaigns, measuring waste streams, using mobile apps, using of extended producer responsibility (EPR), and declaring standards on recyclability. These initiatives are typically cross-cutting and can be part of any of the levers chosen.

MOST INITIATIVES IN THE FOUR SOUTHEAST ASIAN COUNTRIES ARE CONCENTRATED IN A FEW REGIONS



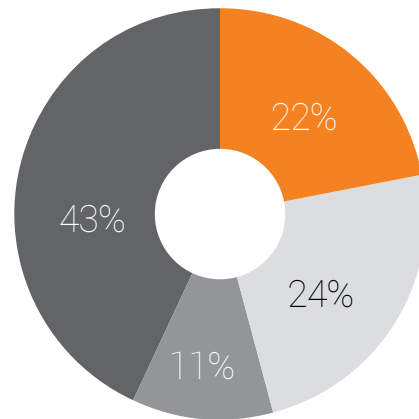
INDONESIA



- Java
- Bali and Nusa Tenggara
- Nationwide
- Other regions



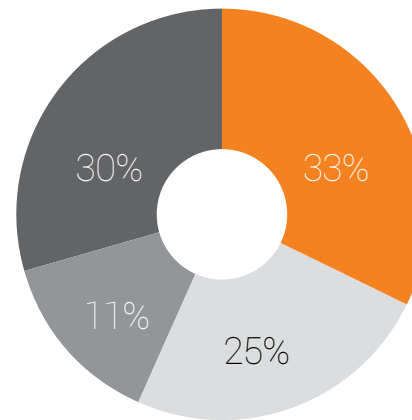
PHILIPPINES



- Calabarzon and Mimaropa
- National Capital Region
- Soccsksargen
- Other regions



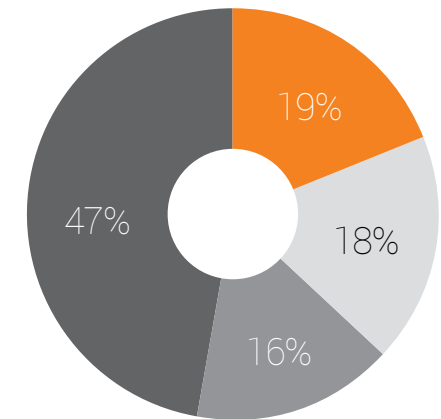
THAILAND



- Central
- Nationwide
- Northeast
- Other regions



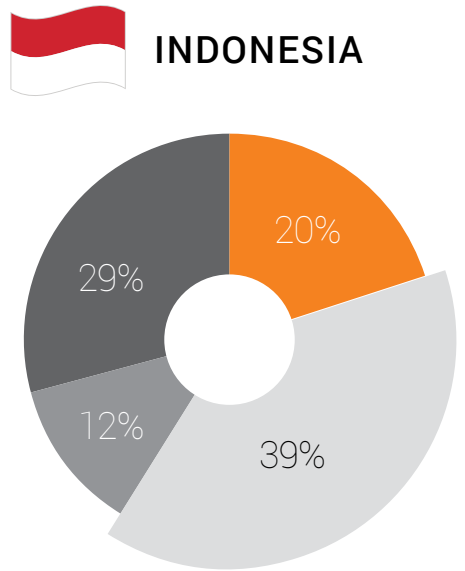
VIETNAM



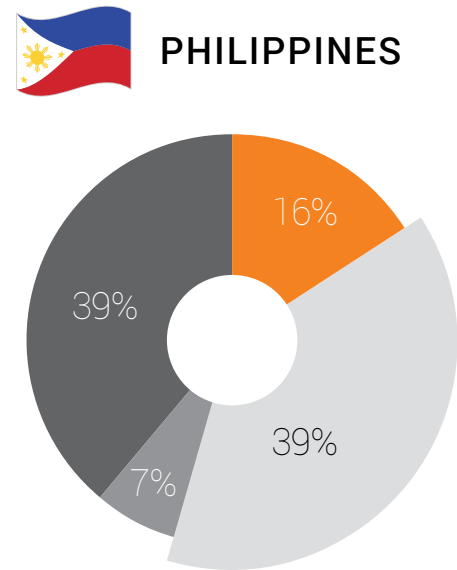
- Red River Delta
- Nationwide
- Southeastern
- Other regions

SOURCE: Initiative landscape review (desktop), expert interviews, online surveys

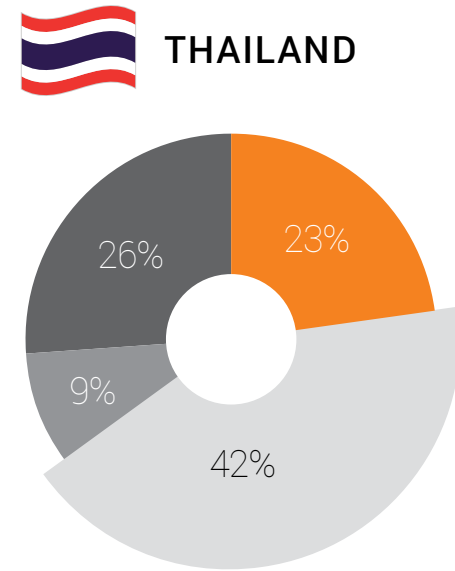
INITIATIVES IN THE FOUR SOUTHEAST ASIAN COUNTRIES VARY IN FOCUS



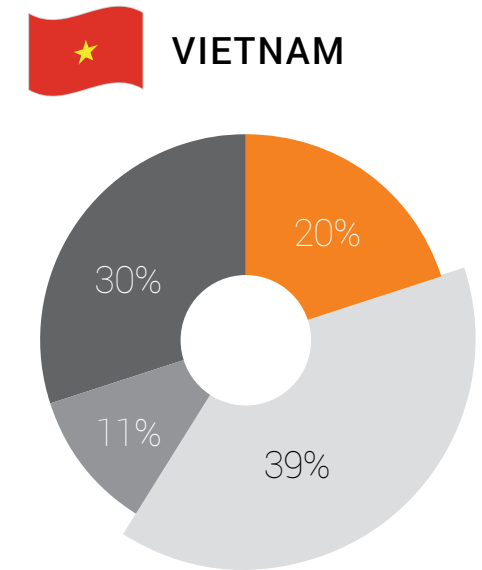
- Reducing inputs into the system
- **Enhancing collection rates for after-use plastics**
- Plugging leakage in post collection
- Creating value for waste reuse



- Reducing inputs into the system
- **Enhancing collection rates for after-use plastics**
- Plugging leakage in post collection
- **Creating value for waste reuse**



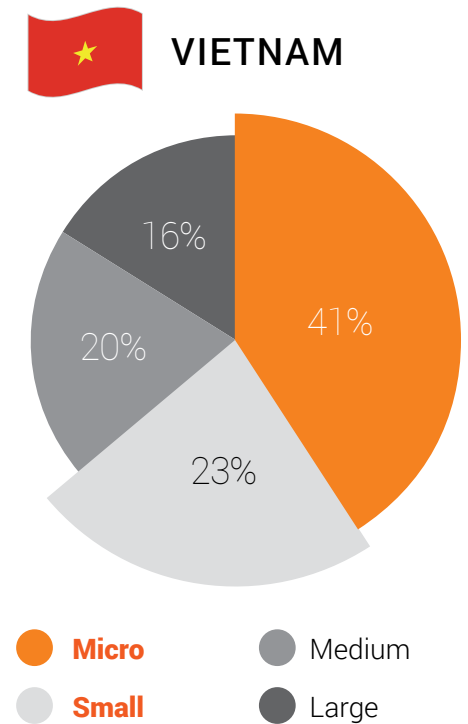
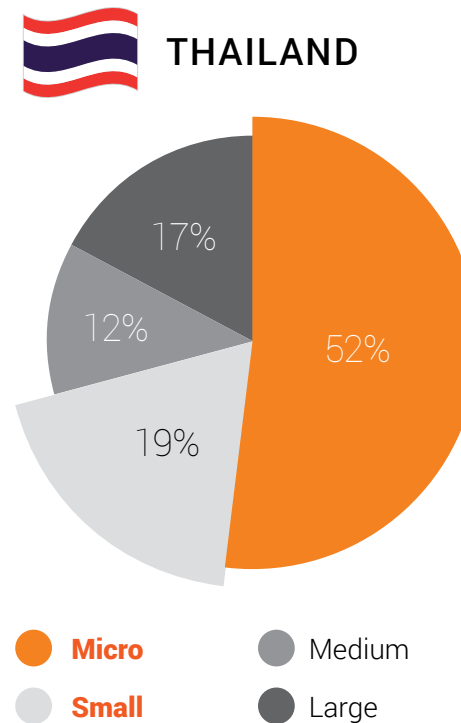
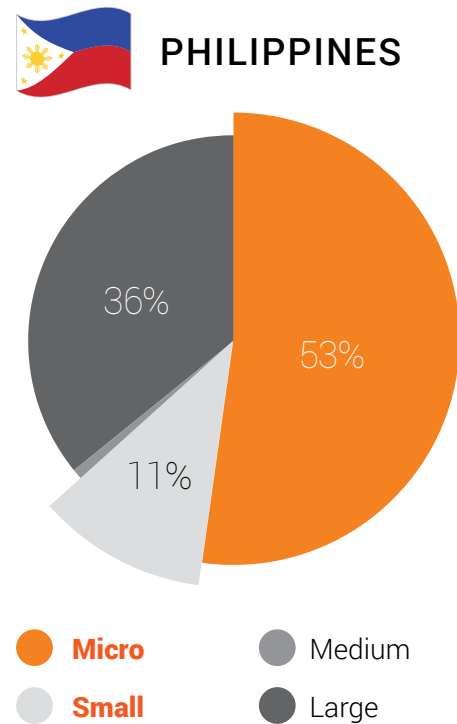
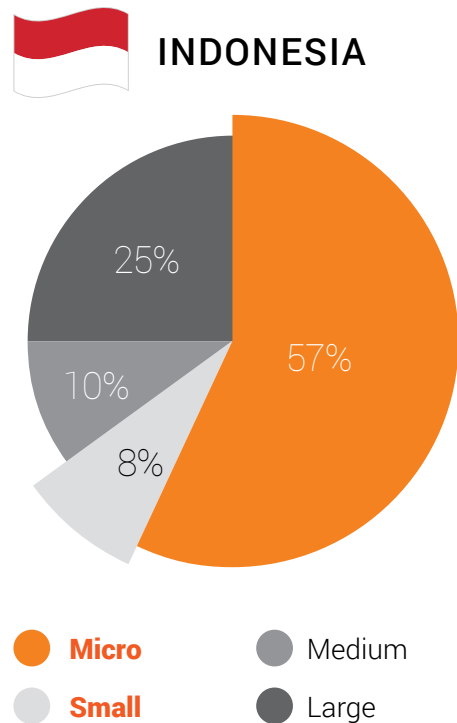
- Reducing inputs into the system
- **Enhancing collection rates for after-use plastics**
- Plugging leakage in post collection
- Creating value for waste reuse



- Reducing inputs into the system
- **Enhancing collection rates for after-use plastics**
- Plugging leakage in post collection
- Creating value for waste reuse

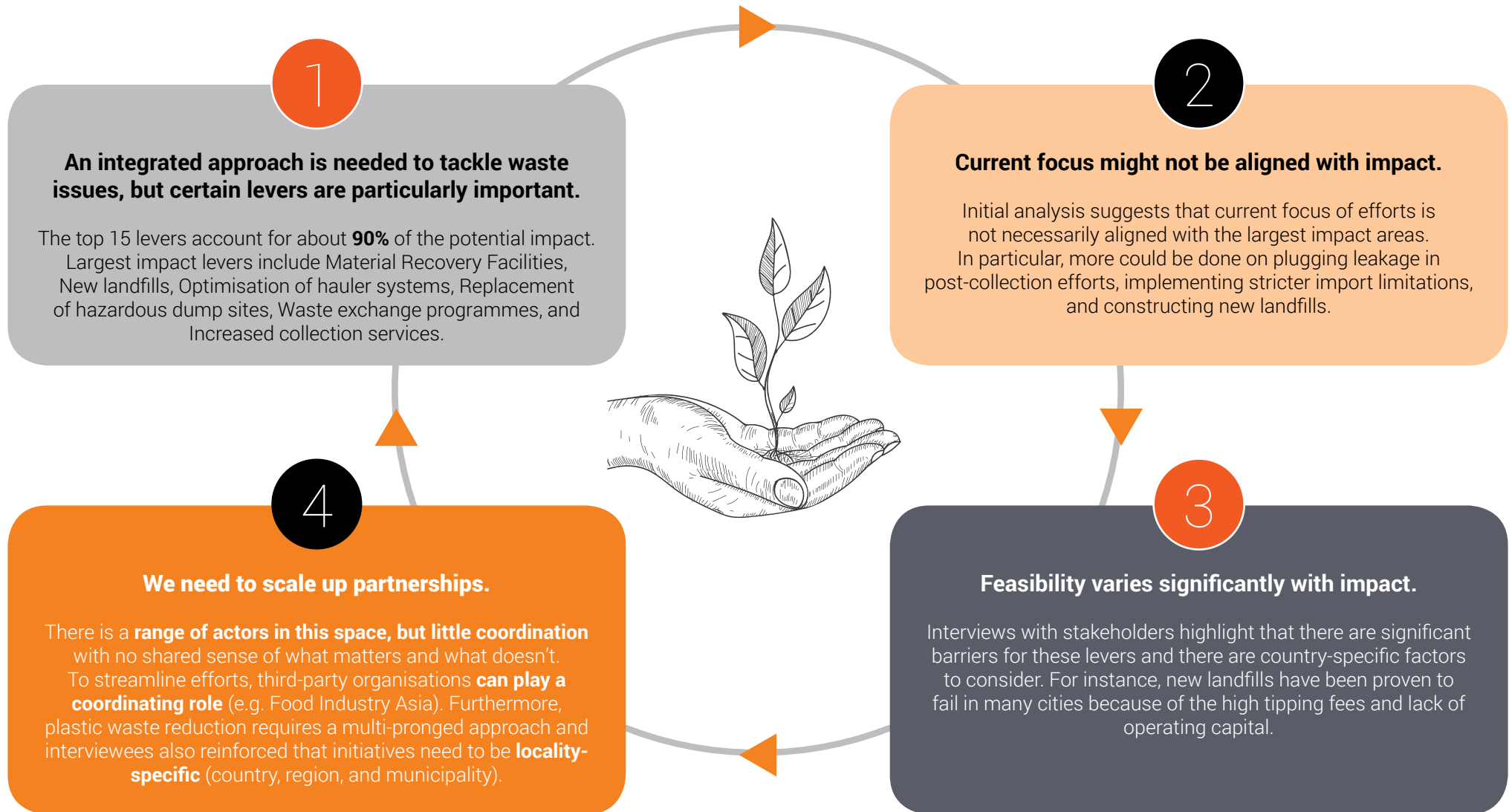
SOURCE: Initiative landscape review (desktop), expert interviews, online surveys

INITIATIVES IN THE FOUR SOUTHEAST ASIAN COUNTRIES VARY IN SCALE



¹ Interventions are defined based on a combination of investment, regional coverage, and target intervention group coverage. "Micro" is defined as US\$50k or less, affects 1% or less of plastic waste generated, or covers one province or less in Indonesia (or 2 in Philippines/Thailand/Vietnam case); "Small" has funding between US\$50-250k, affects between 1% and 5% of waste generated, or operates in 1-3 provinces in Indonesia (or 2-10 in Philippines/Thailand/Vietnam case); "Medium" has funding of US\$250-500k, affects between 5-10% of waste generated, or operates in 4-10 provinces in Indonesia (or 11-25 in Philippines/Thailand/Vietnam case); and "Large" has funding of >US\$500k, affects > 10% of waste generated, or operates in 11-34 provinces in Indonesia (or 26 or more in Philippines/Thailand/Vietnam case).

4 KEY INSIGHTS HAVE EMERGED ON HOW TO CREATE IMPACT ON PLASTIC WASTE ISSUES IN THESE COUNTRIES

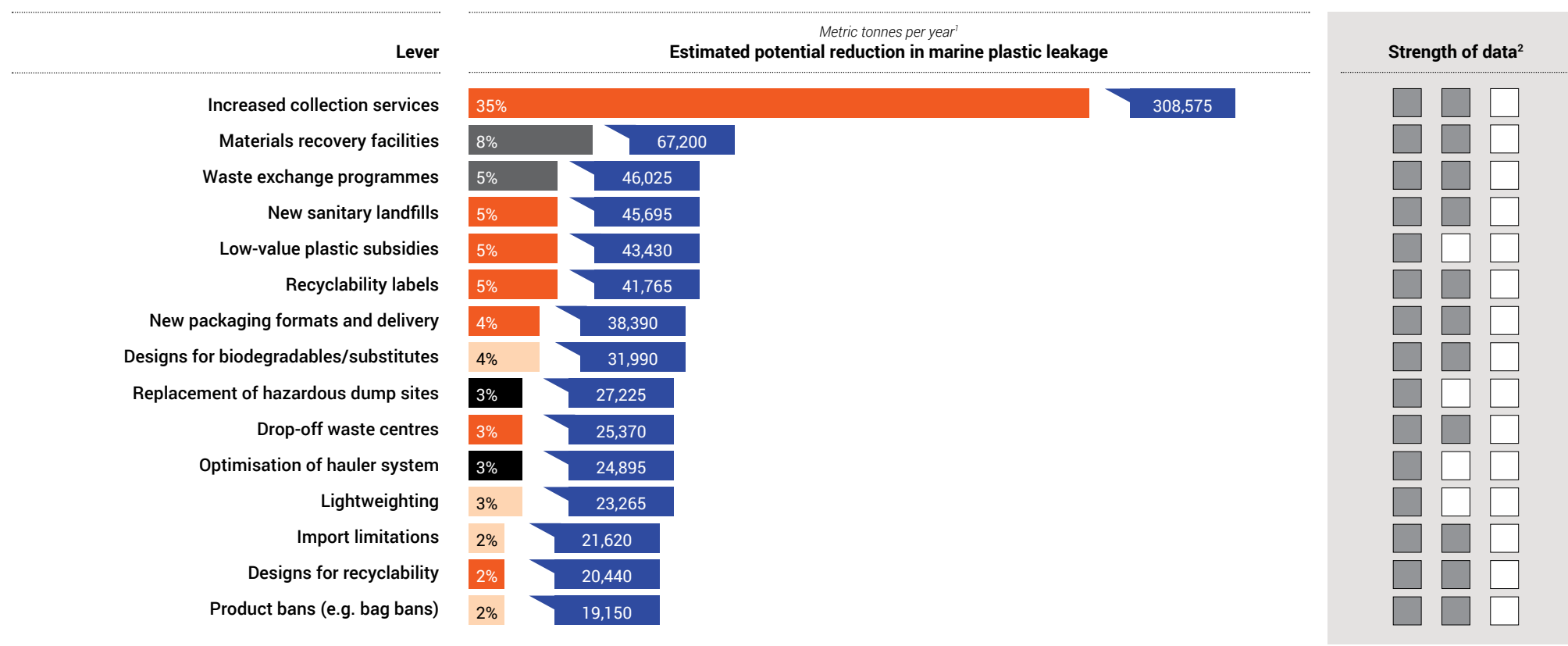


1. Importance of an integrated approach

THE TOP 15 LEVERS IN INDONESIA ACCOUNT FOR ABOUT 90 PERCENT OF ESTIMATED POTENTIAL REDUCTION IN MARINE PLASTIC LEAKAGE



● Reducing inputs
 ● Enhancing collection rates
 ● Plugging leakage
 ● Creating value for waste reuse



¹ Rounded to the nearest 5 metric tonnes.

² The strength of data, depicted by the number of boxes, is based on the availability of local and international case studies for key assumptions. Where there are no available data, reasonable assumptions are used. One box – There are no available statistics; Two boxes – There are country-specific international case studies to serve as proxies; and Three boxes – There are good localised case studies.

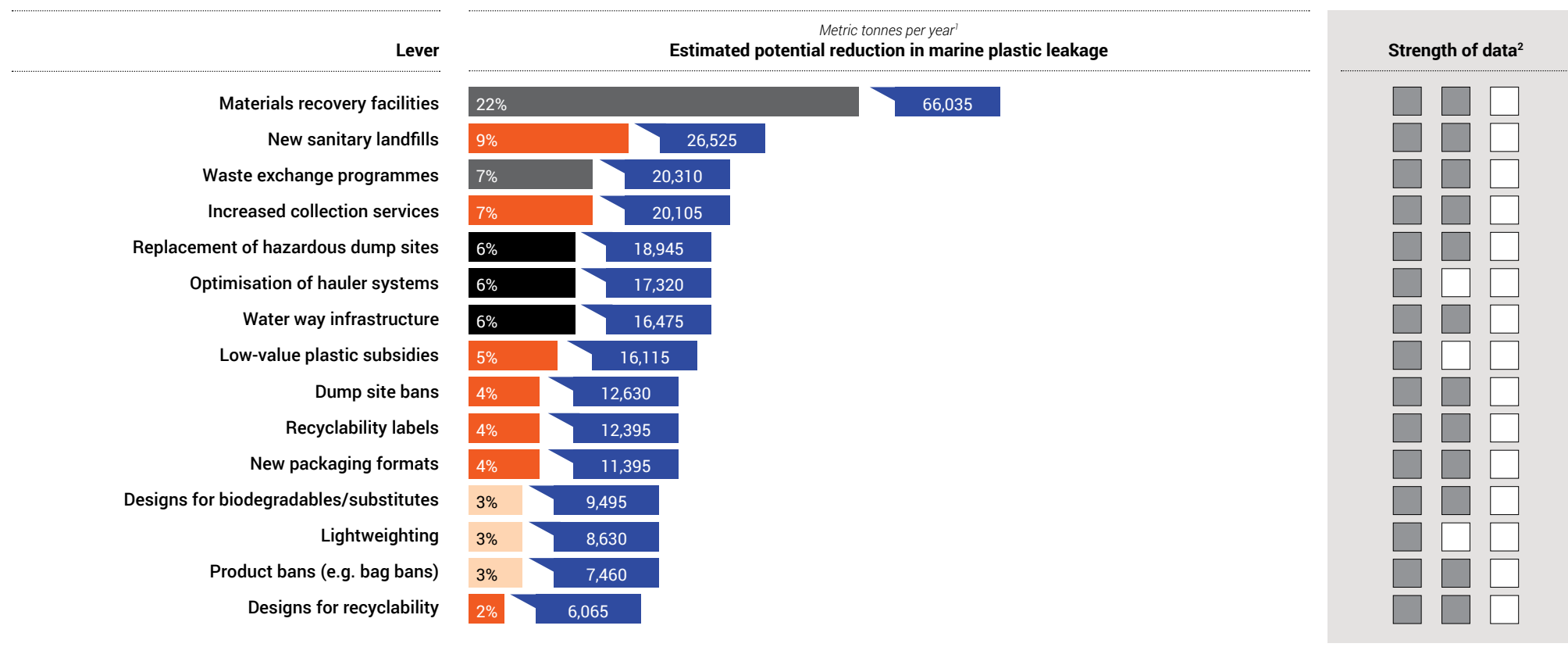
SOURCE: Ocean Conservancy, literature search, experts' interviews, online survey, AlphaBeta analysis

1. Importance of an integrated approach

THE TOP 15 LEVERS IN PHILIPPINES ACCOUNT FOR ABOUT 90 PERCENT OF ESTIMATED POTENTIAL REDUCTION IN MARINE PLASTIC LEAKAGE



● Reducing inputs
 ● Enhancing collection rates
 ● Plugging leakage
 ● Creating value for waste reuse



¹ Rounded to the nearest 5 metric tonnes.

² The strength of data, depicted by the number of boxes, is based on the availability of local and international case studies for key assumptions. Where there are no available data, reasonable assumptions are used. One box – There are no available statistics; Two boxes – There are country-specific international case studies to serve as proxies; and Three boxes – There are good localised case studies.

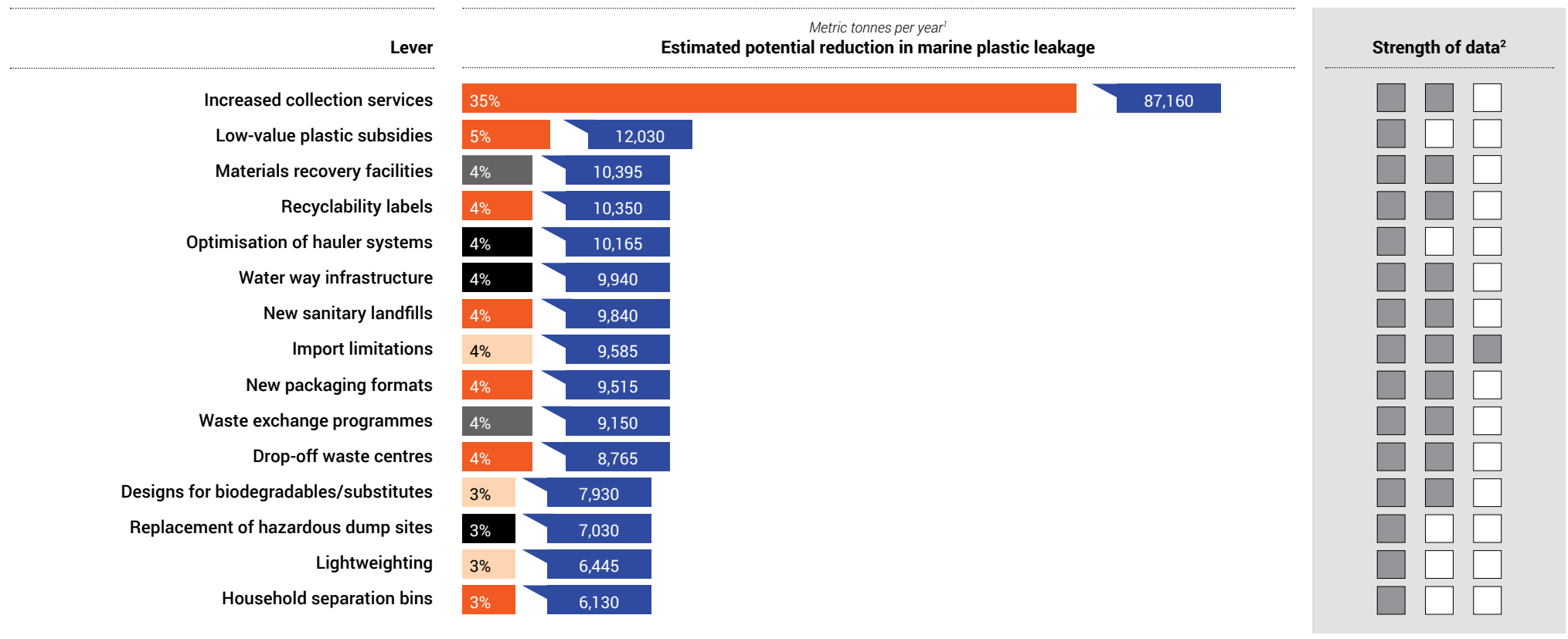
SOURCE: Ocean Conservancy, literature search, experts' interviews, online survey, AlphaBeta analysis

1. Importance of an integrated approach

THE TOP 15 LEVERS IN THAILAND ACCOUNT FOR ABOUT 87 PERCENT OF ESTIMATED POTENTIAL REDUCTION IN MARINE PLASTIC LEAKAGE



● Reducing inputs
 ● Enhancing collection rates
 ● Plugging leakage
 ● Creating value for waste reuse



¹ Rounded to the nearest 5 metric tonnes.

² The strength of data, depicted by the number of boxes, is based on the availability of local and international case studies for key assumptions. Where there are no available data, reasonable assumptions are used. One box – There are no available statistics; Two boxes – There are country-specific international case studies to serve as proxies; and Three boxes – There are good localised case studies.

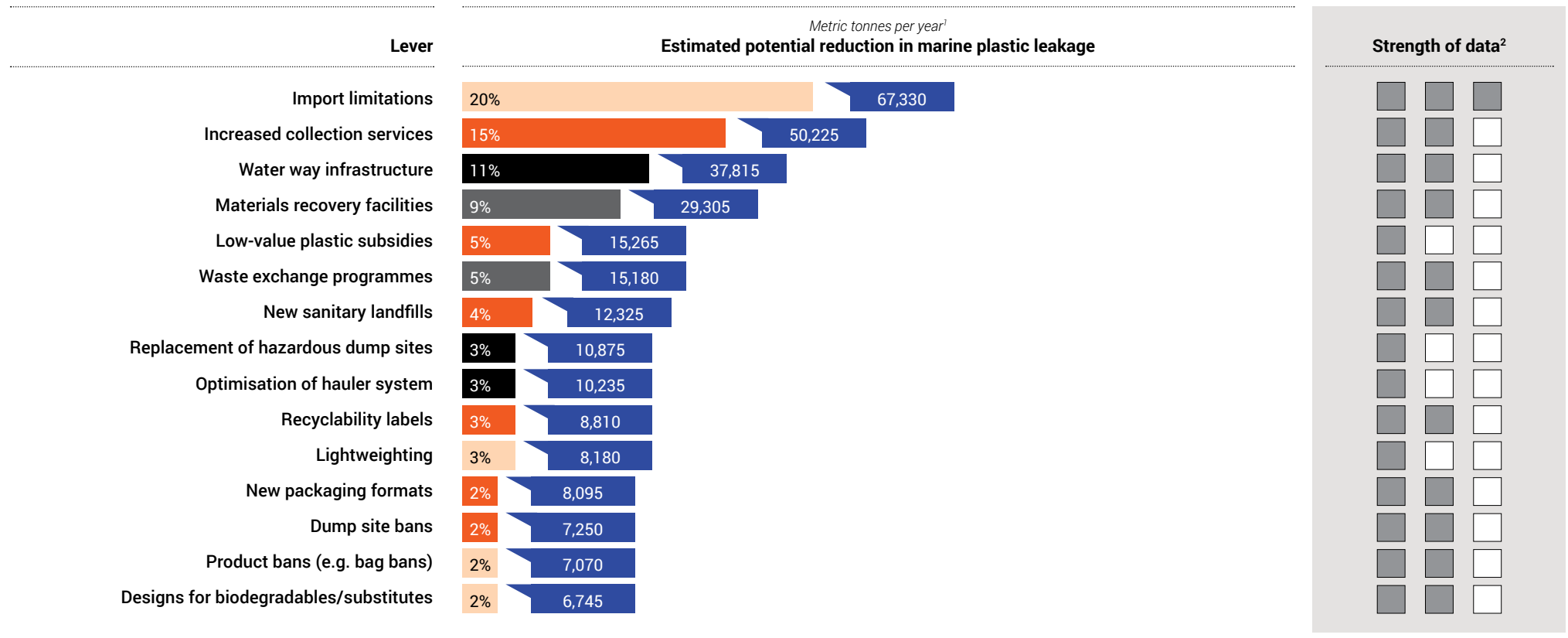
SOURCE: Ocean Conservancy, literature search, experts' interviews, online survey, AlphaBeta analysis

1. Importance of an integrated approach

THE TOP 15 LEVERS IN VIETNAM ACCOUNT FOR FOR ABOUT 89 PERCENT OF ESTIMATED POTENTIAL REDUCTION IN MARINE PLASTIC LEAKAGE



● Reducing inputs
 ● Enhancing collection rates
 ● Plugging leakage
 ● Creating value for waste reuse



¹ Rounded to the nearest 5 metric tonnes.

² The strength of data, depicted by the number of boxes, is based on the availability of local and international case studies for key assumptions. Where there are no available data, reasonable assumptions are used. One box – There are no available statistics; Two boxes – There are country-specific international case studies to serve as proxies; and Three boxes – There are good localised case studies.

SOURCE: Ocean Conservancy, literature search, experts' interviews, online survey, AlphaBeta analysis

KEY INSIGHTS FROM IMPACT SIZING AND EXPERT INTERVIEWS



LANDFILLS MATTER

Replacing hazardously located landfills and establishing new landfills is important in all countries, particularly in the short term, as technologies for reuse are still gaining scale to make them commercially viable.



IMPORT LIMITATIONS ARE BECOMING INCREASINGLY CRUCIAL

Due to China's bans on plastic scraps in 2017, there have been significant increases in plastic waste entering the Southeast Asian markets (e.g. Vietnam experienced a 65% y-o-y increase). Given the general lack of robust waste management and treatment systems in these countries, it is crucial that the local governments restrict the flows of plastic scrap imports.



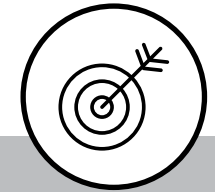
OPTIMISING HAULER SYSTEMS IS PARTICULARLY IMPORTANT IN SOME COUNTRIES

A large share of plastic marine leakage in the Philippines is in post collection, as such it is crucial to ensure that there are no further preventable leakages from the transportation of waste. This could be achieved by having stricter monitoring, installing GPS and surveillance camera systems, as well as providing incentives for compliance.



PACKAGING INNOVATION IS CRUCIAL

Packaging innovation can play an important role in increasing recyclability of products, in addition to finding more sustainable alternatives (e.g. biodegradable packaging). However, experts cautioned on unintended consequences, such as light weighting of products reducing incentives for recycling, and also the need for alternative products (e.g. bioplastics) to undergo safety testing (e.g. food safety certification).



PLASTIC BAG BANS HAVE SURPRISINGLY LOW IMPACT

It does not rank in the top 10 levers in any of the four countries. Possible reasons include ineffective enforcement and monitoring approaches, lack of education amongst consumers and businesses, and relatively small share of plastic bags vis-à-vis other plastic packaging.

THERE ARE **INNOVATIVE WAYS** TO IMPLEMENT THE LEVERS

NON-EXHAUSTIVE



REDUCING INPUTS INTO THE SYSTEM

Packaging designs for biodegradables and substitutes

Evoware, in Indonesia, has managed to use seaweed to create durable small-format packaging to reduce the amount of plastics



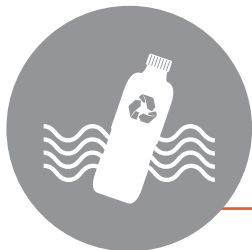
ENHANCING COLLECTION RATES FOR AFTER-USE PLASTICS

Increased collection services

In Thailand, the **Songkhla Province** authorities separate the area into many communities to decentralise collection services and promote collaboration with the informal sector

Pay-As-You-Throw Waste disposal fees

City of Bayawan Government imposed a PAYT fee on the quantity of waste generated, resulting in a 20% reduction of waste sent to landfills



PLUGGING LEAKAGE IN POST COLLECTION

Optimisation of hauler systems

The **Bangkok Metropolitan Authority** in Thailand is considering the use of GPS systems to improve waste management



CREATING VALUE FOR WASTE REUSE

Waste exchange programmes

The Philippine Business for the Environment (PBE) runs the Industrial Waste Exchange Programme from the 1990s to reduce waste

Advanced plastic waste treatment techniques

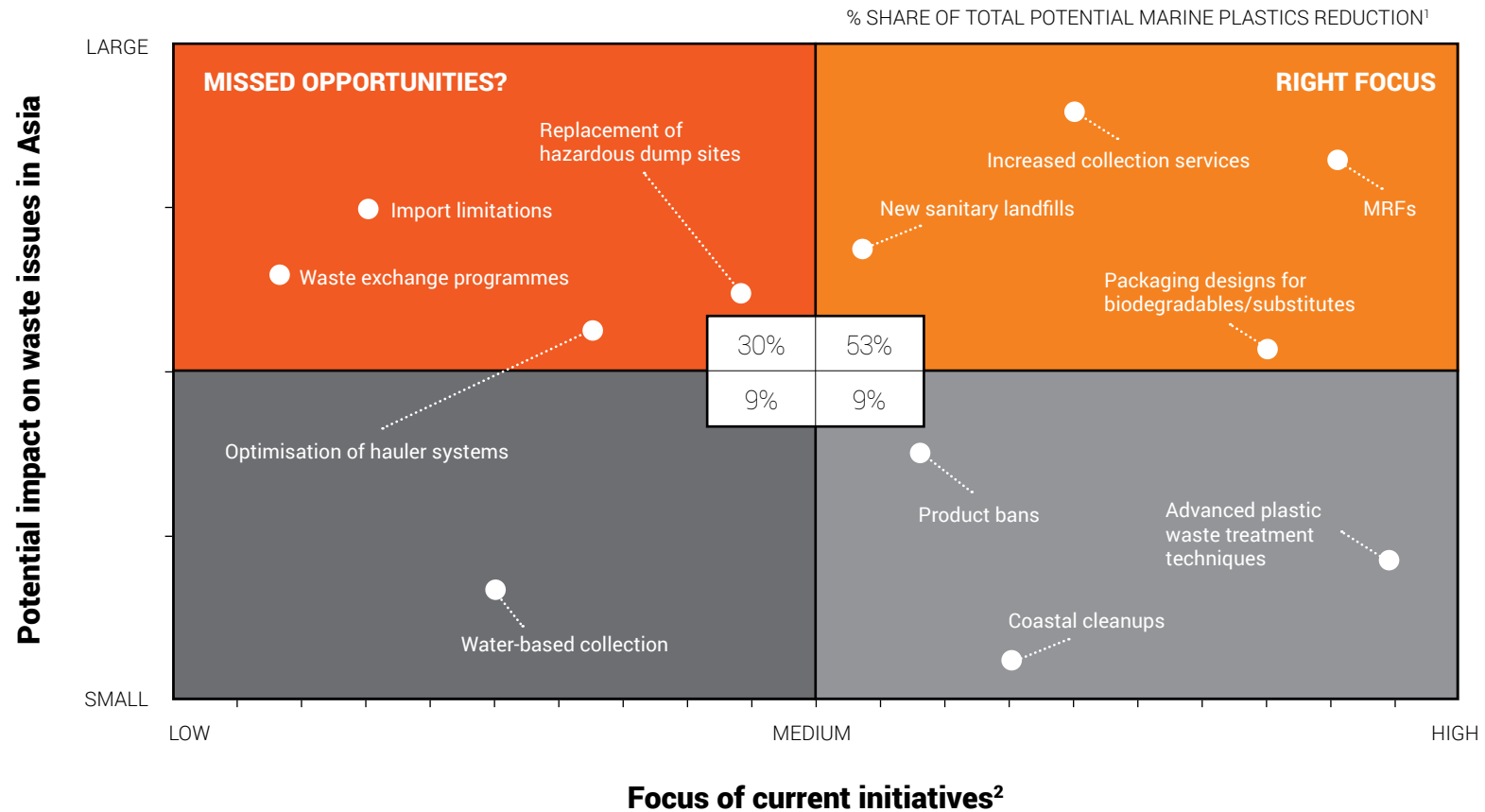
In Vietnam, **Unilever** is piloting a recycling model based on solvolysis technology in Ho Chi Minh City, and intends to roll out to the rest of the country



2. Current focus might not be aligned with impact

CURRENT FOCUS IS NOT NECESSARILY ALIGNED WITH IMPACT IN THESE COUNTRIES

OUT OF 31 LEVERS



¹ Might not add up to 100% due to rounding.

² Levers ranked based on the focus of current initiatives in Indonesia, the Philippines, Thailand, and Vietnam.

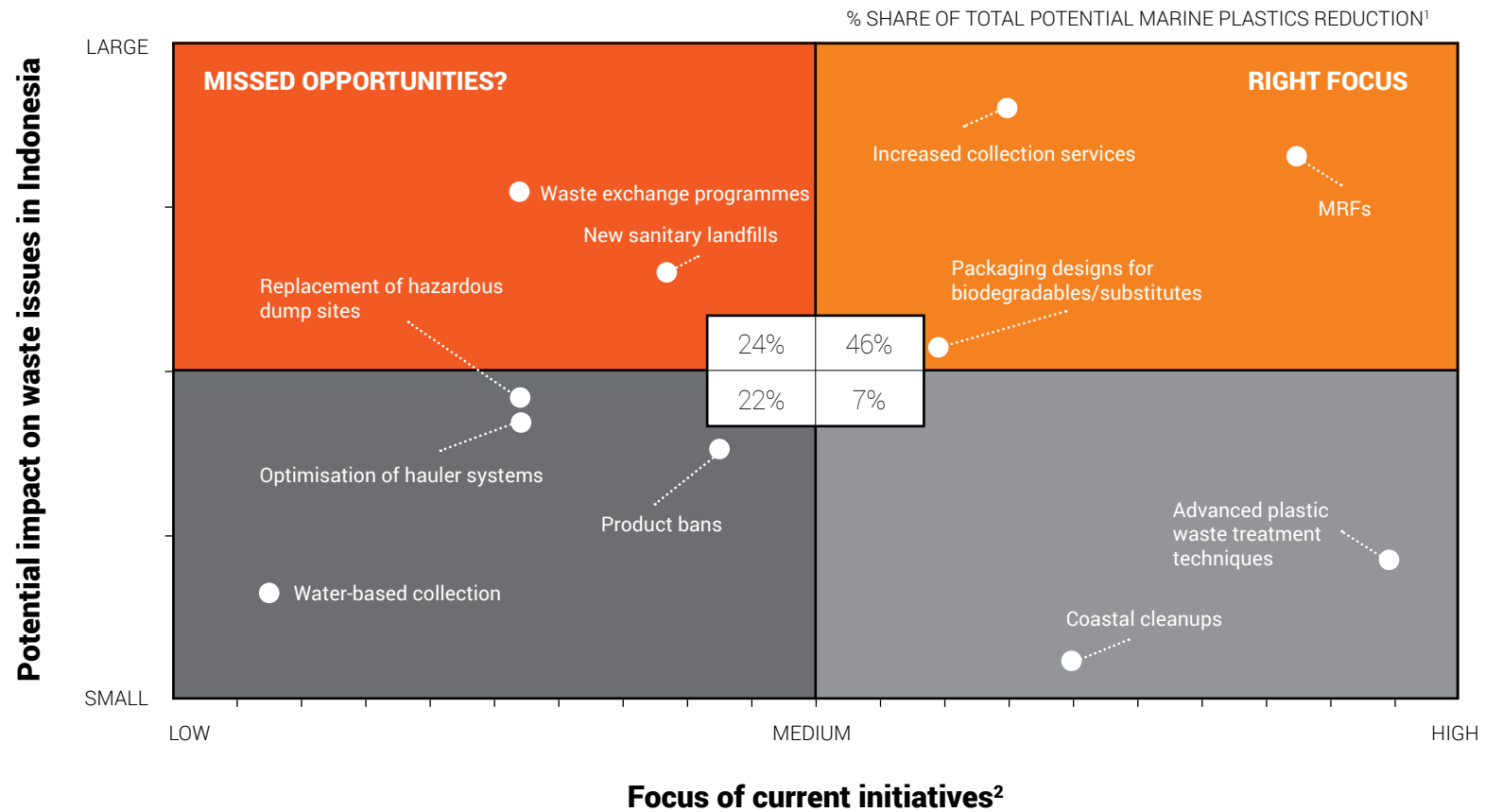
SOURCE: Literature search; Expert interviews; AlphaBeta analysis

2. Current focus might not be aligned with impact



CURRENT FOCUS IS NOT NECESSARILY ALIGNED WITH IMPACT IN INDONESIA

OUT OF 31 LEVERS



¹ Might not add up to 100% due to rounding.

² Levers ranked based on the focus of current initiatives.

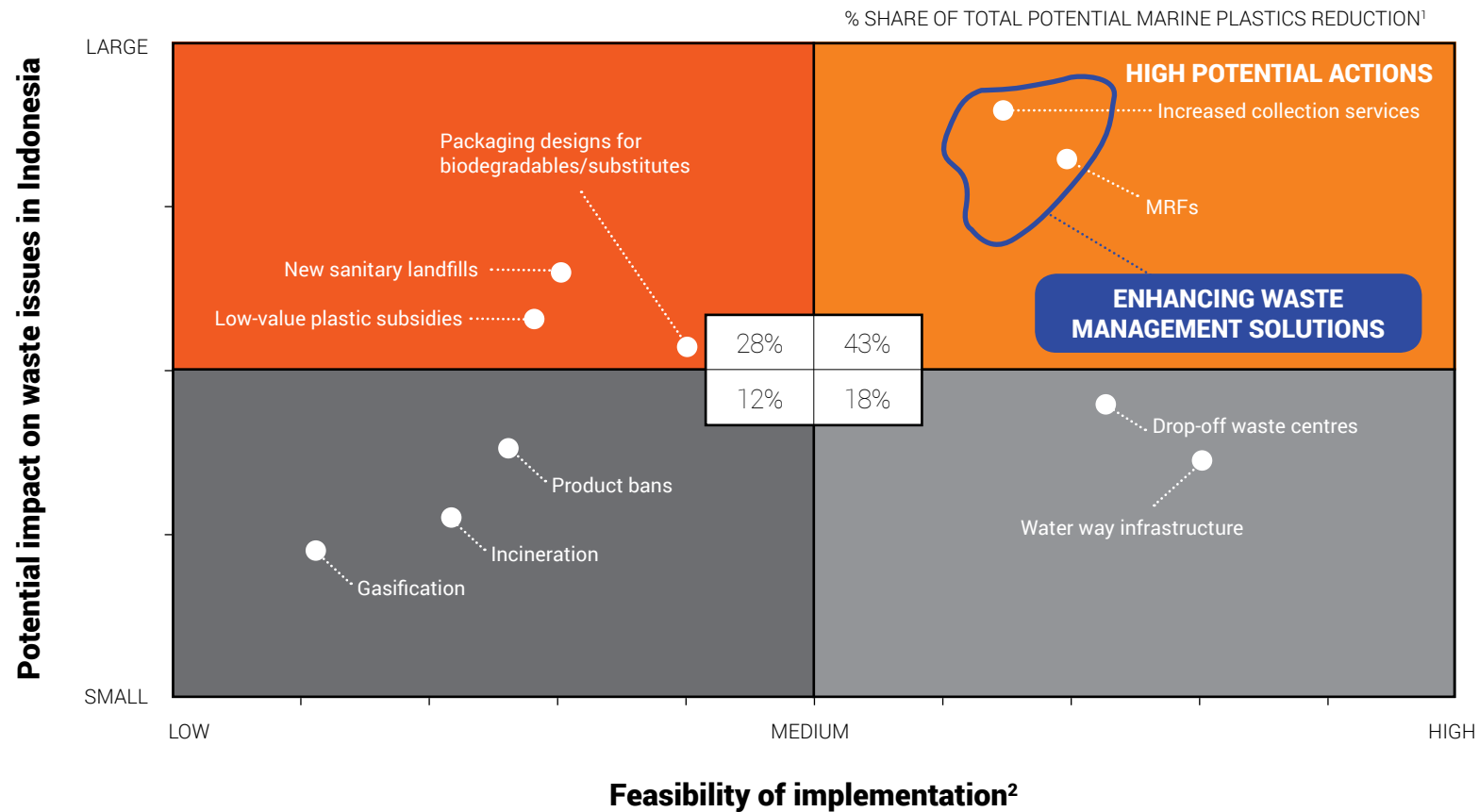
SOURCE: Literature search; Expert interviews; AlphaBeta analysis

3. Feasibility varies significantly with impact



GOVERNMENTS, INDUSTRY, NGOS, AND ACADEMIA SHOULD CONTINUE TO FOCUS ON ENHANCING WASTE COLLECTION SYSTEMS FOR A START

OUT OF 31 LEVERS



¹ Might not add up to 100% due to rounding.

² Based on an assessment of the feasibility of implementation, including regulatory requirements, social acceptance, capital constraints, technological feasibility, and commercial feasibility.

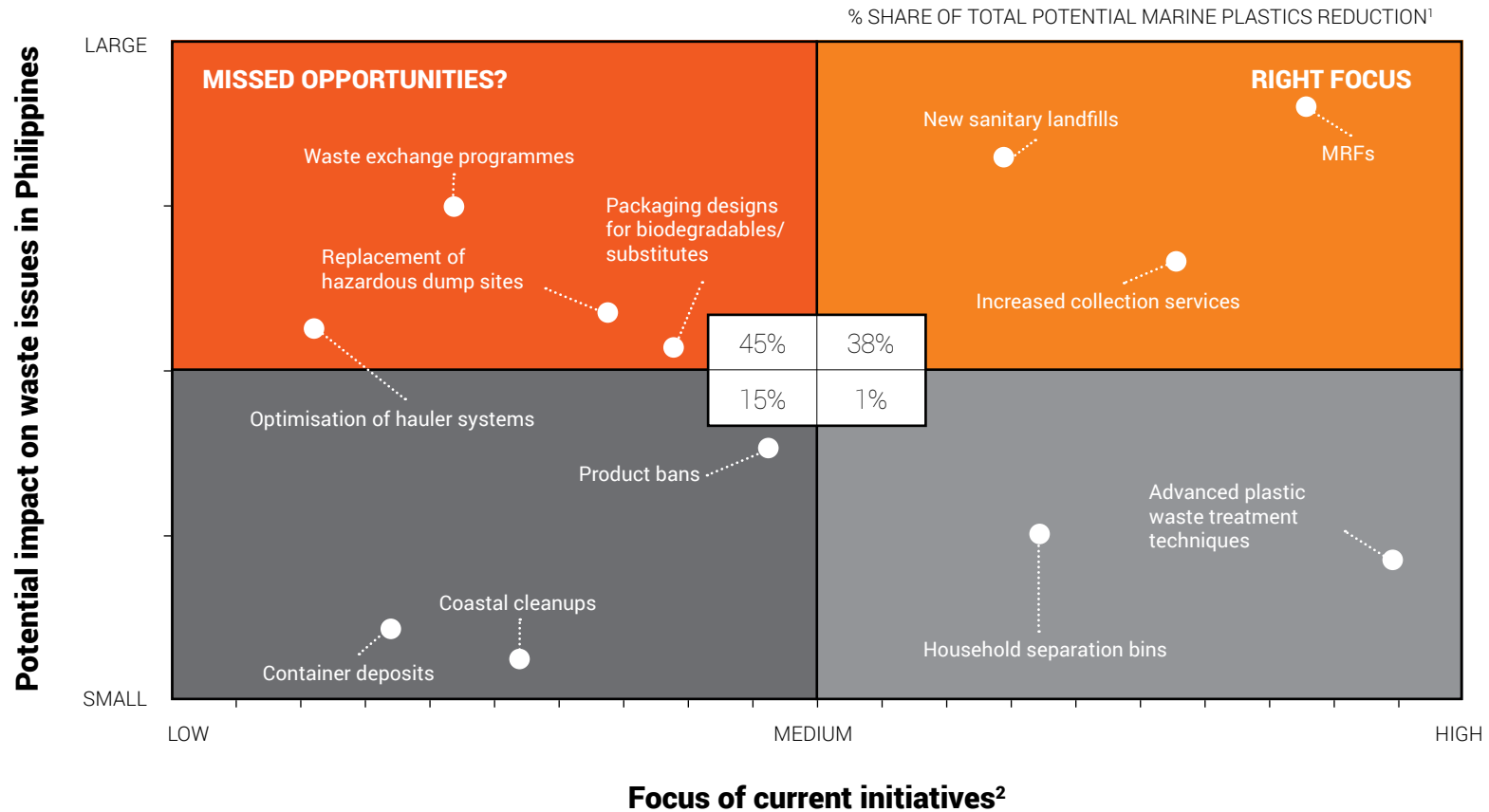
SOURCE: Literature search; Expert interviews; AlphaBeta analysis

2. Current focus might not be aligned with impact



CURRENT FOCUS IS NOT NECESSARILY ALIGNED WITH IMPACT IN PHILIPPINES

OUT OF 31 LEVERS



¹ Might not add up to 100% due to rounding.

² Levers ranked based on the focus of current initiatives.

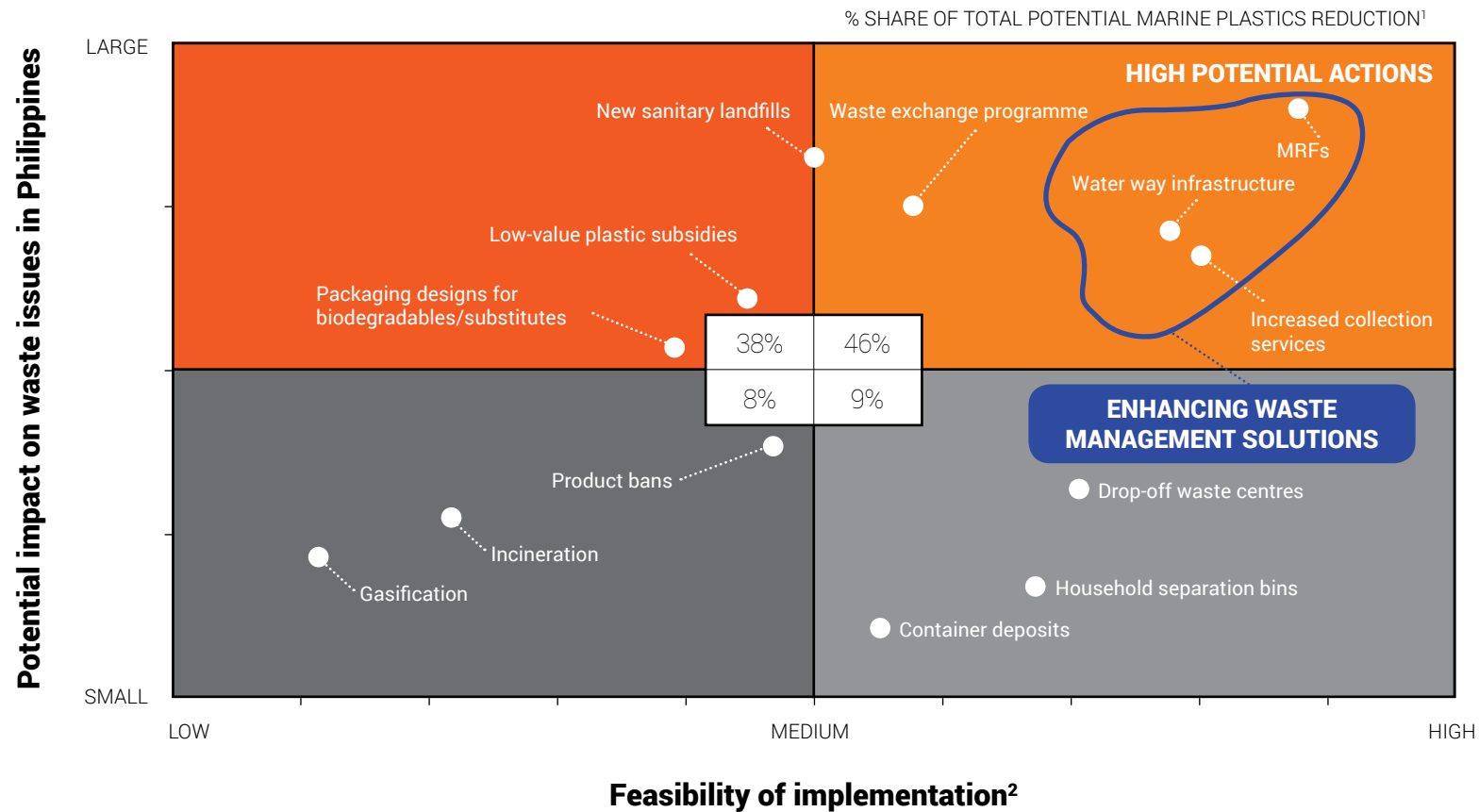
SOURCE: Literature search; Expert interviews; AlphaBeta analysis

3. Feasibility varies significantly with impact



OUT OF 31 LEVERS

GOVERNMENTS, INDUSTRY, NGOS, AND ACADEMIA SHOULD CONTINUE TO FOCUS ON ENHANCING WASTE COLLECTION SYSTEMS FOR A START



¹ Might not add up to 100% due to rounding.

² Based on an assessment of the feasibility of implementation, including regulatory requirements, social acceptance, capital constraints, technological feasibility, and commercial feasibility.

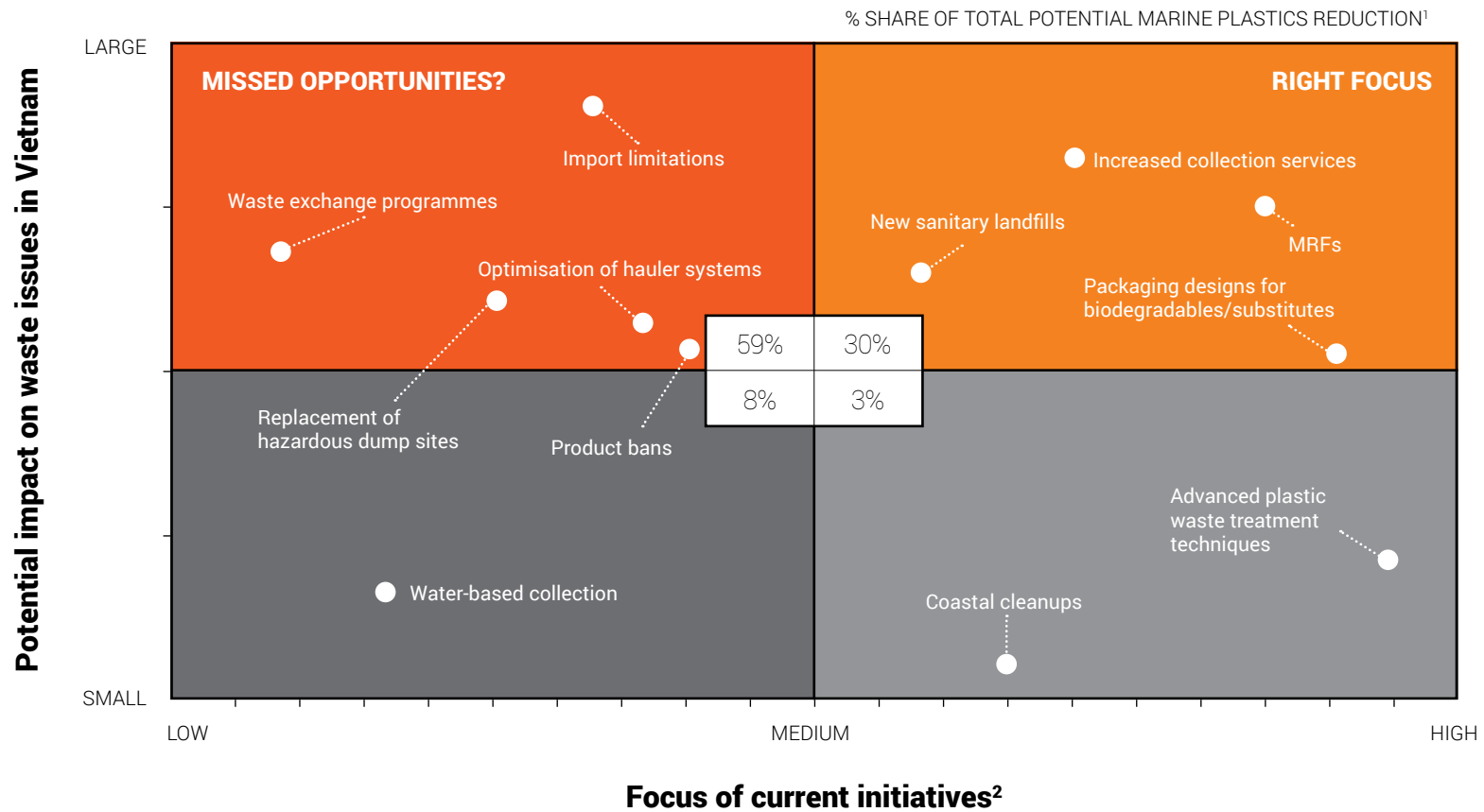
SOURCE: Literature search; Expert interviews; AlphaBeta analysis

2. Current focus might not be aligned with impact



CURRENT FOCUS IS NOT NECESSARILY ALIGNED WITH IMPACT IN VIETNAM

OUT OF 31 LEVERS



¹ Might not add up to 100% due to rounding.

² Levers ranked based on the focus of current initiatives.

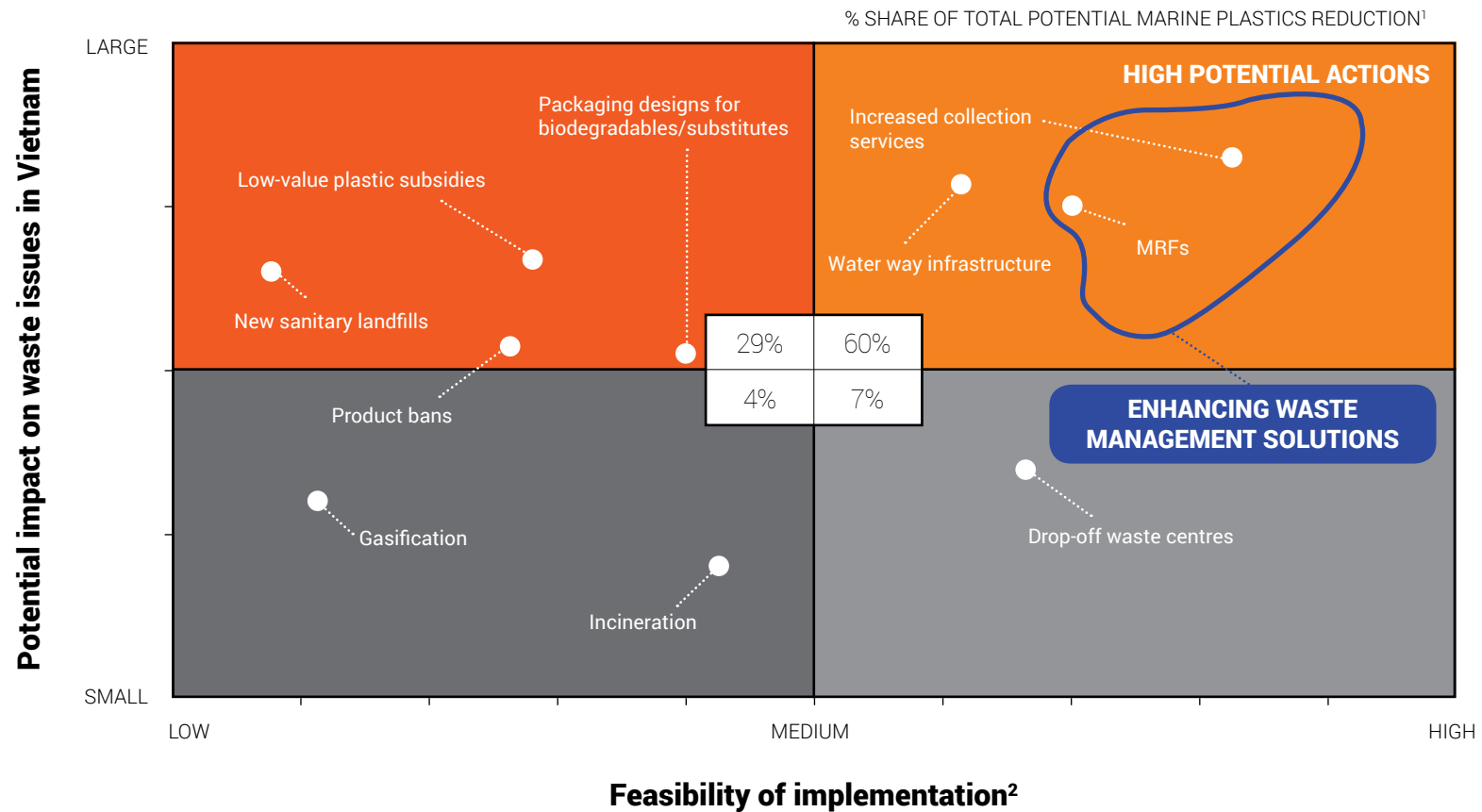
SOURCE: Literature search; Expert interviews; AlphaBeta analysis

3. Feasibility varies significantly with impact



OUT OF 31 LEVERS

GOVERNMENTS, INDUSTRY, NGOS, AND ACADEMIA SHOULD CONTINUE TO FOCUS ON ENHANCING WASTE COLLECTION SYSTEMS FOR A START



¹ Might not add up to 100% due to rounding.

² Based on an assessment of the feasibility of implementation, including regulatory requirements, social acceptance, capital constraints, technological feasibility, and commercial feasibility.

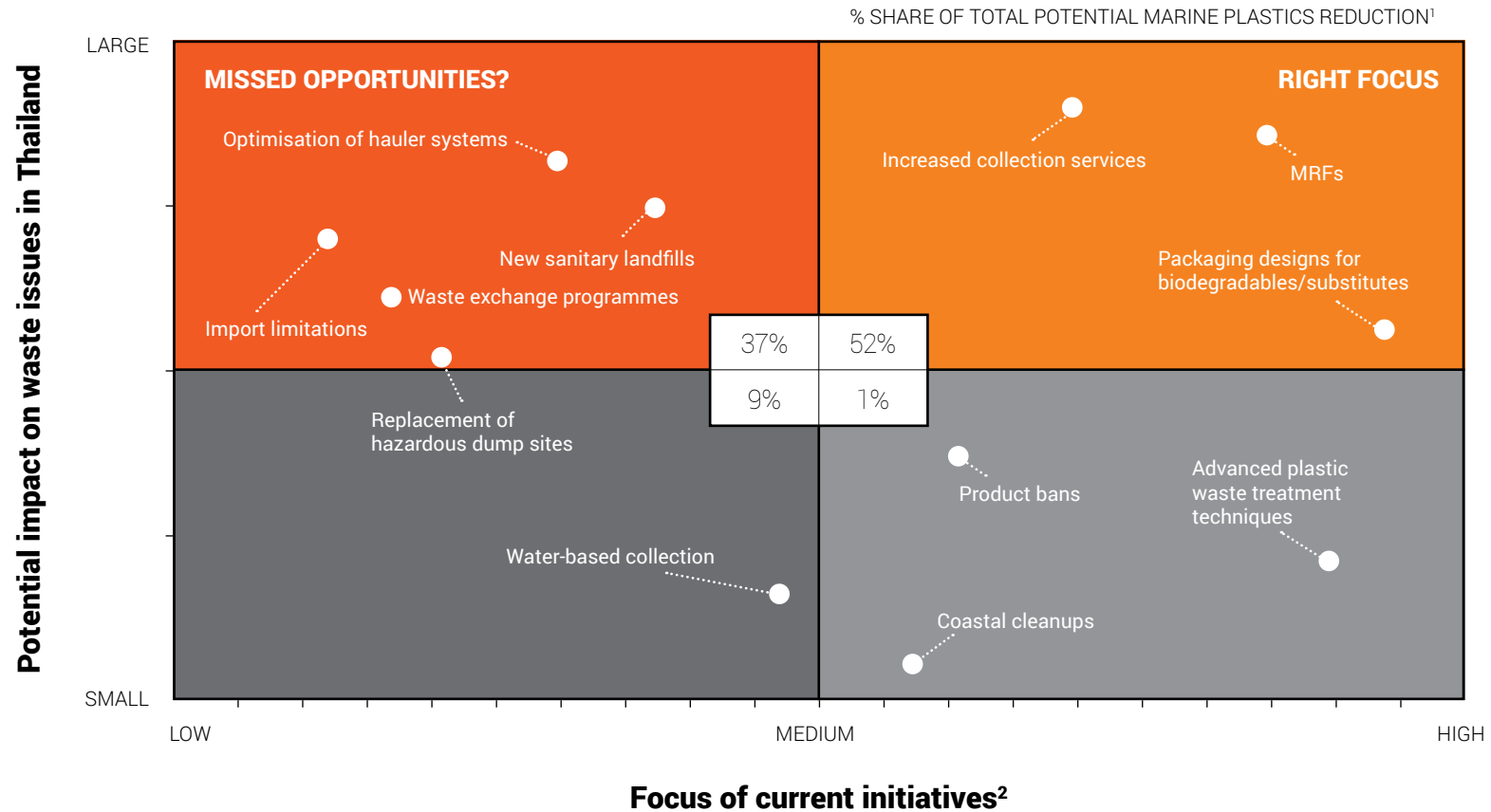
SOURCE: Literature search; Expert interviews; AlphaBeta analysis

2. Current focus might not be aligned with impact



CURRENT FOCUS IS NOT NECESSARILY ALIGNED WITH IMPACT IN THAILAND

OUT OF 31 LEVERS



¹ Might not add up to 100% due to rounding.

² Levers ranked based on the focus of current initiatives.

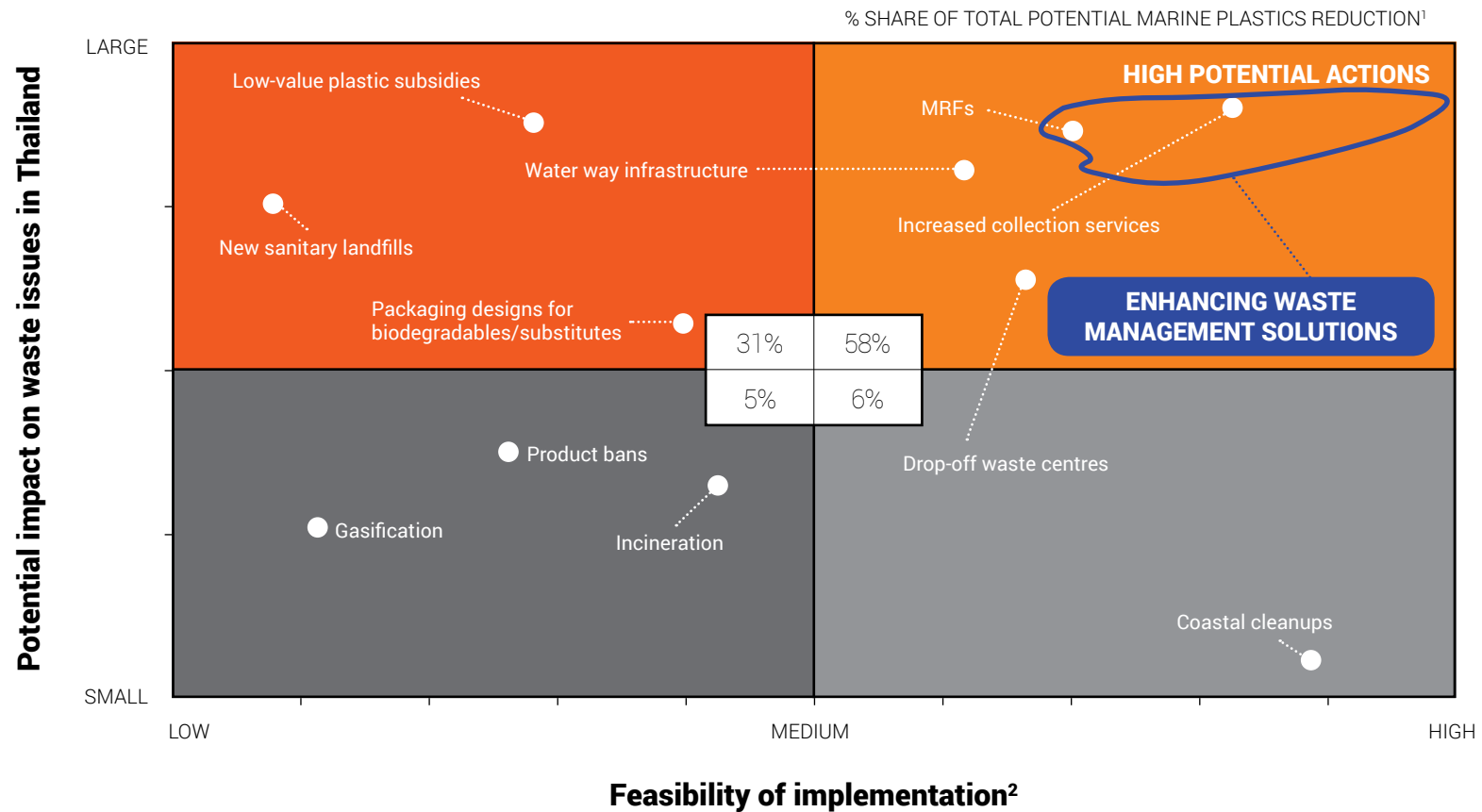
SOURCE: Literature search; Expert interviews; AlphaBeta analysis

3. Feasibility varies significantly with impact



GOVERNMENTS, INDUSTRY, NGOS, AND ACADEMIA SHOULD CONTINUE TO FOCUS ON ENHANCING WASTE COLLECTION SYSTEMS FOR A START

OUT OF 31 LEVERS



¹ Might not add up to 100% due to rounding.

² Based on an assessment of the feasibility of implementation, including regulatory requirements, social acceptance, capital constraints, technological feasibility, and commercial feasibility.

SOURCE: Literature search; Expert interviews; AlphaBeta analysis



Lack of robust impact metrics and measurement methodologies can hamper reduction efforts

Several provinces, such as Songkhla in Thailand, have expressed concerns that although they have recycling and reduction targets, they do not know their baseline statistics (e.g. waste generation) and how to quantify success. Potential metrics could include cost per tonne diverted as well as volume of waste diverted (noting that sachets are light but important to be removed).



Political will needs to be coupled with economic incentives

Initiatives need to be designed to ensure continuity across election cycles (such as “mayor-proofing” projects).



Establishing properly-managed landfills is challenging in reality

Despite good designs, sanitary landfills often fail or devolve into open dumpsites because of high startup and operating costs (i.e. low ROI for investors), lack of land space as well as mechanisms to incentivise behaviour. For instance, waste management companies would rather dispose of the trash in open dumpsites much further away because sanitary landfills charge relatively high tipping fees.



MRFs matter but need to be complemented with low-value plastic subsidies and other incentives

A significant share of mismanaged plastic waste is low-value plastics such as plastic bags and sachets (in contrast, recycling rates for PET bottles are high). Therefore, stakeholders could leverage the informal waste sector and create an after-use market for low-value plastics. A pilot in Dagupan City (a small city in the Philippines) incentivised collection by paying (e.g. 5 cents) for these plastics – it has collected over 25 tonnes of waste thus far. Though not a large amount, it proved that economic incentives work and have scaling potential.





Plastics are still necessary in all four countries; therefore, uniform bans alone are unlikely to be feasible

Many countries have tried to ban single-use plastics but in most cities, these bans have failed because there are no viable alternatives or lack of enforcement. For instance, wet food cannot last in paper packaging.



Project planning needs to be holistic

There might be the tendency to be reactive and construct solutions based on short-term needs. However, it is important to plan for the long-term as well. This include factoring in political risk, ensuring adequate capacity building (e.g. for subsequent maintenance) as well as creating sufficient policy, regulatory, and market incentives for stimulating investments. For instance, in Vietnam, while there is demand for compost, there are no legal frameworks in place that enable a market.



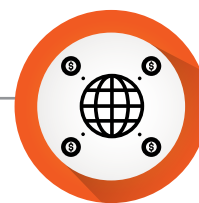
Source segregation needs to be coupled with robust back-end waste management systems and education

While household separation bins are useful for source segregation and relatively affordable to implement, the results are lacking if there are no proper integrated waste management systems or education campaigns.



There is a need to streamline coordinating agencies

There are often many government agencies looking into waste management in countries in Asia (e.g. Public Works, Energy, and Environment). Their policies might be conflicting and create confusion amongst consumers. Furthermore, enforcement is less effective without a dedicated taskforce.



One viable approach to spur action is establishing and adhering to standards on recyclability

Many global companies have already publicly declared targets on recyclability and started initiatives to achieve that goal.

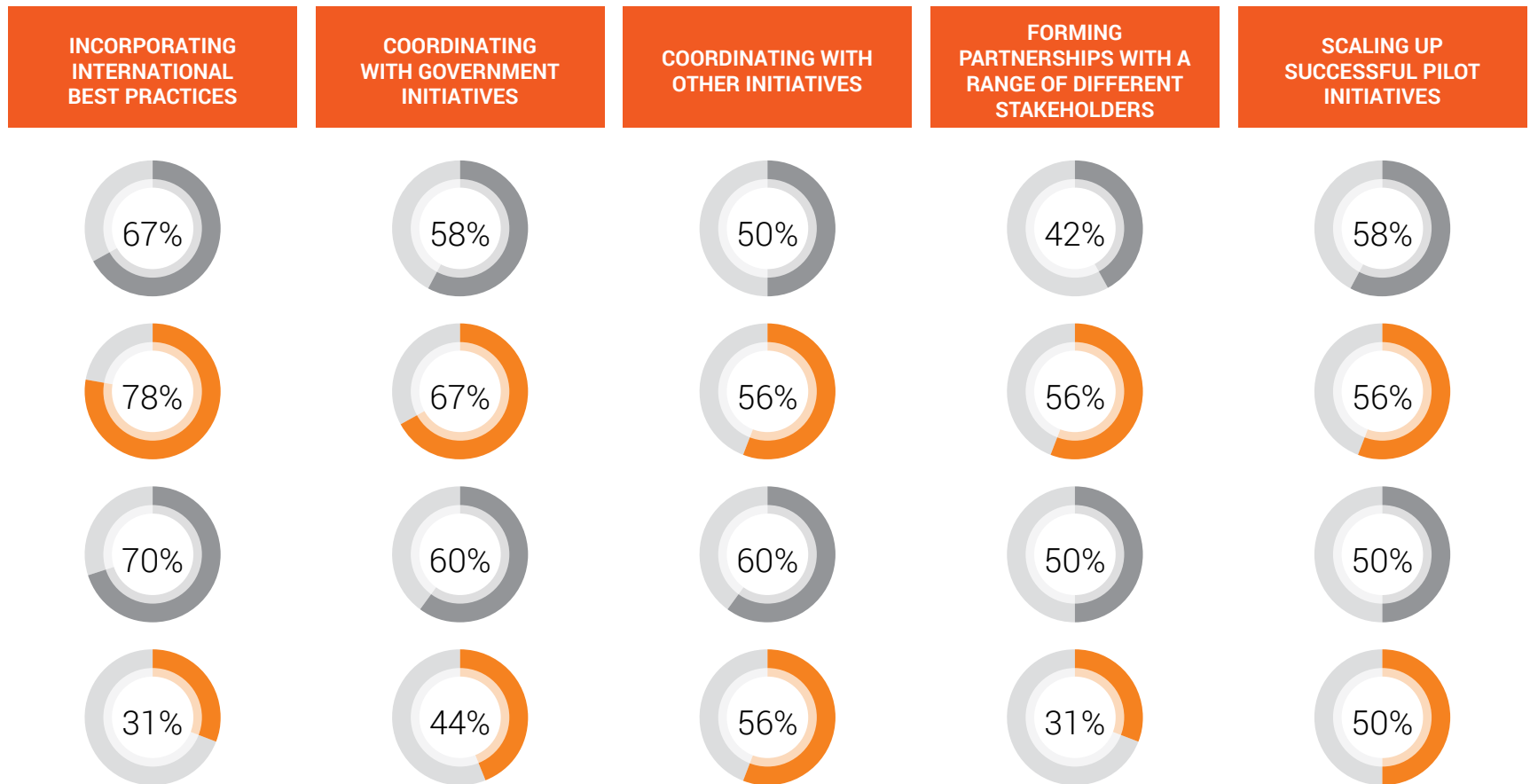


It is crucial to think beyond plastics

While the current focus is mainly on plastics, it is wise to consider other materials (e.g. food waste and other packaging waste) and the totality of the waste stream to ensure impact and viability. In many of these countries, plastics only account for less than 15% of the total waste streams. Hence, stakeholders need to consider this factor while designing waste management approaches.

4. We need to scale up partnerships

SURVEY RESULTS INDICATE STRONG POTENTIAL FOR INCORPORATING INTERNATIONAL BEST PRACTICES, SCALING UP INITIATIVES, AND IMPROVING COORDINATION



¹ Based on 81 respondents from government, civil society, and the private sector who are engaged in waste management efforts in the four countries.

SOURCE: Survey of initiatives



For more information:

EDWIN SEAH

Head, Sustainability & Communications, Food Industry Asia (FIA)
edwin.seah@foodindustry.asia



www.foodindustry.asia