Viet Nam Plastic Action Assessment and Roadmap Considerations

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Contents

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Glossary

APH	An Phat Holdings
ASEAN	Association of Southeast Asian Nations
BAU	Business as usual
CAGR	Compound annual growth rate
CC	Collection coverage
CE	Circular economy
CECR	Center for Environment and Community Research
CFR	Collected for recycling rate
CGFED	Center for Gender, Family and Environment in Development
DFAT	Department of Foreign Affairs and Trade
DONRE	Department of Natural Resources and Environment
DRS	Deposit return system
EHSE	Environment for Humanity Social Enterprise
ENDA Viet Nam	Environment and Development in Action Viet Nam
EPPIC	Ending Plastic Pollution Innovation Challenge
EPR	Extended producer responsibility
EPS	Expanded polystyrene
FAO	Food and Agriculture Organization of the United Nations
FMCG	Fast-moving consumer goods
GDP	Gross domestic product
GESI	Gender equality and social inclusion
GHG	Greenhouse gas
GPAP	Global Plastic Action Partnership
GreenHub	Centre for Supporting Green Development
GSO	General Statistics Office of Viet Nam
HDPE	High-density polyethylene
HORECA	Hotel, Restaurant, Café
ICED	Institute for Circular Economy Development
ISPONRE	Institute of Strategy and Policy on Natural Resources and Environment
IUCN	International Union for Conservation of Nature
IWC	Independent waste collectors
JS	Junk shops
LCA	Life cycle assessment
LEP	Law on Environmental Protection
LMI	Lower-middle income
LMP	Landfill material pickers
MARD	Ministry of Agriculture and Rural Development
MCD	Centre for Marinelife Conservation and Community Development
MFA	Material flow analysis
MOC	Ministry of Construction
MOLISA	Ministry of Labour - Invalids and Social Affairs
MONRE	Ministry of Natural Resources and Environment
MPA	Marine protected areas
MSW	Municipal solid waste
NCC	No collection coverage
NGO	Non-governmental Organisation
NPAP	National Plastic Action Partnership
NSEP	National Strategy on Environmental Protection
P2F	Plastic-to-fuel
PAPI	Viet Nam Provincial Governance and Public Administration Performance Index
PET	Polyethylene terephthalate
PETCO	South Africa PET Plastic Recycling
PIT	Plastics Institute of Thailand
PP	Polypropylene
PPE	Polyphenylene ether
PRO	Packaging Recovery Organizations
PROVN	Packaging Recycling Organization Viet Nam
PS	Polystyrene
PVC	Polyvinyl chloride
R&D	Research and development
RC	Recyclable collectors
SAPEA	Science Advise for Policy by European Academies
SCS	System change scenario
SIWI	Stockholm International Water Institute
SUP	Single-use plastics
TPY	Tonnes per year
UNDP	United Nations Development Programme
UNFPA	United Nations Population Fund
URENCO	Urban Environment Company
USAID	United States Agency for International Development
VPA	Vietnam Plastics Association
WC	Waste collectors
WEF	World Economic Forum
WHO	World Health Organization,
WWF	World Wide Fund for Nature

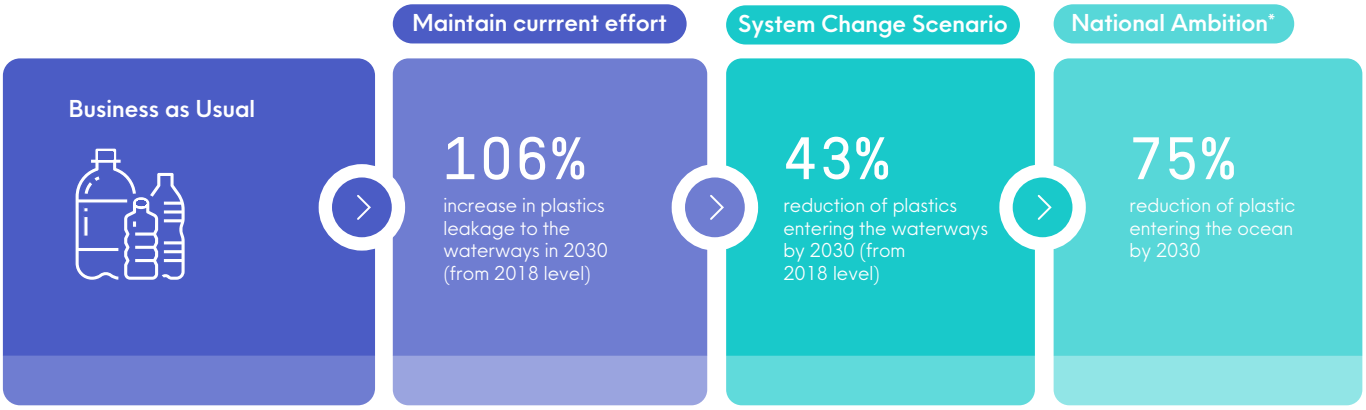
Executive Summary

Background

Viet Nam has enjoyed rapid economic growth over the past three decades and been the focus of many multinational and government investment portfolios. But in recent years, that growth has been coupled with a significant increase in consumption and, consequently, an increase in waste. It's estimated that Viet Nam generates around 3.7 million tonnes of post-consumer plastic waste each year, a figure that's growing by 6.2% annually. Despite major commitments from government, industry and civil society, leakage of plastic waste into the country's water bodies is projected to grow by 106% between 2018 and 2030, from approximately 182,000 tonnes per year to 373,000 tonnes per year.

In 2019, the Government of Viet Nam began a collaboration with the Global Plastic Action Partnership (GPAP), a multistakeholder platform hosted by the World Economic Forum (WEF). Together, on 23 December 2020, they launched the Viet Nam **National Plastic Action Partnership (NPAP)** to take urgent and unprecedented action on plastic leakage. NPAP Viet Nam was created with the participation of Deputy Prime Minister Trinh Dinh Dung, WEF President Borge Brende, Ministry of Natural Resources and Environment (MONRE) Minister Tran Hong Ha and other key national leaders. The NPAP complements and supports many initiatives already underway in Viet Nam to reduce plastic leakage, led by national and local governments, businesses, academia and non-governmental organizations. The aim of NPAP Viet Nam is to coordinate and catalyse action by policymakers, industry executives, investors and civil society leaders. The partnership also supports the government's targets to reduce plastic litter in oceans by 50% by 2025 and by 75% by 2030, as outlined in the National Program for Strengthening Plastic Waste Management and the National Action Plan for Management of Marine Plastic Litter by 2030, as well as contributing to the nation's progress towards the Sustainable Development Goals.

Due to a variety of complex biological and socio-cultural factors, the impacts of plastic pollution affect diverse groups of men and women differently in terms of opportunities, risks, exposure and health outcomes. Therefore, an inclusive and gender-responsive transition to a circular economy is essential if Viet Nam and the rest of the world is to respond to plastic pollution successfully and sustainably. Ensuring this will enable nations to systematically address existing inequalities in the plastic value chain and make certain that interventions and roadmap actions directly benefit and empower the individuals and communities affected. Furthermore, it helps facilitate a better quality of life and more opportunities for traditionally marginalized individuals and communities, including female workers in the informal sector, to benefit equally from the transition to a circular economy. Therefore, this report has been informed by a gender analysis to ensure that recommended actions address diverse needs and the disproportionate impacts of plastic pollution on different groups, particularly women and affected communities.



* National Action Plan on Management of Marine Plastic Debris, 2019.

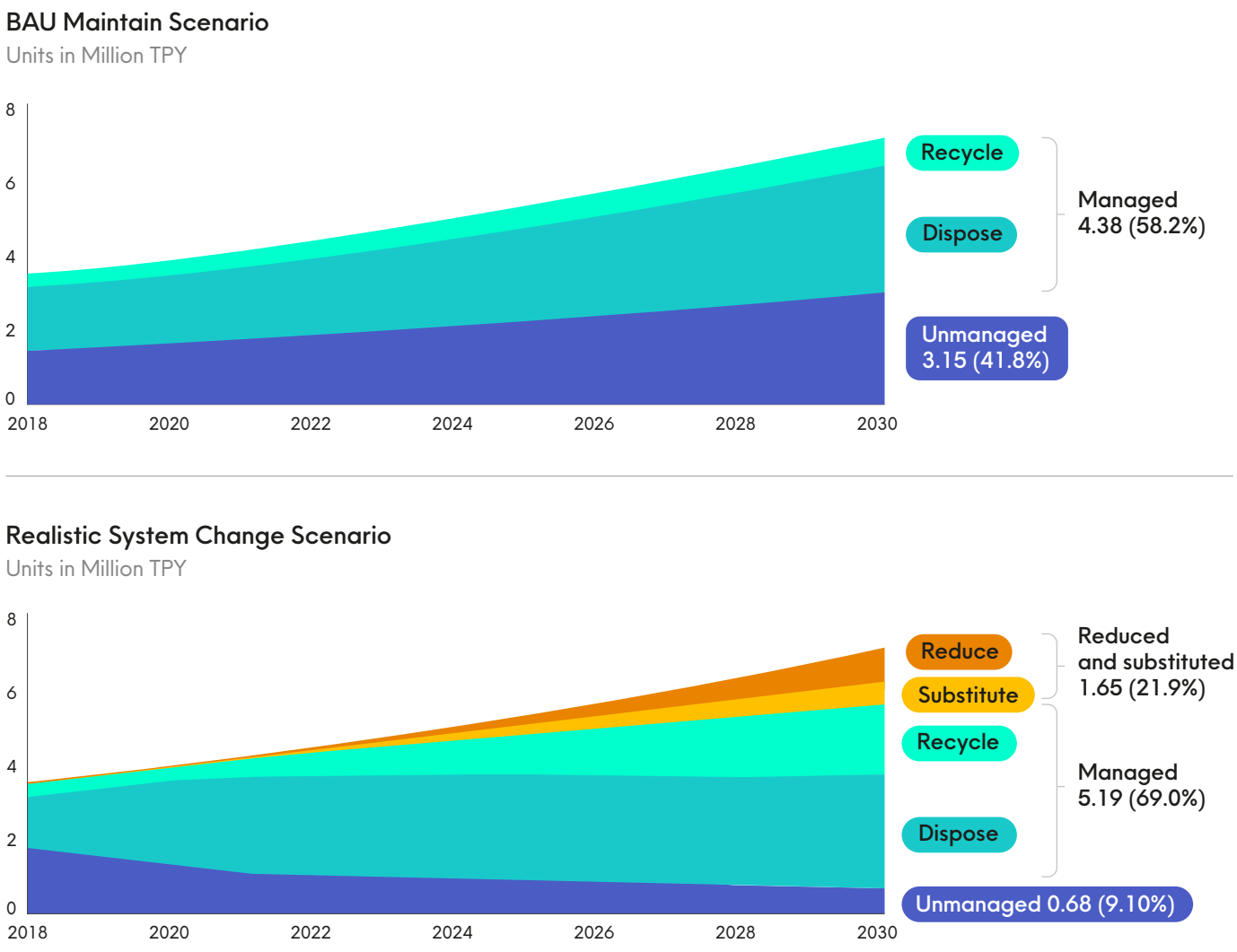
A system change is needed

This report presents an ***ambitious*** set of actions for Viet Nam to deliver on its challenging goals for dealing with plastic waste pollution. The underlying research for this report comes from data and insights gathered through consultations with experts and practitioners (refer to appendix B for the methodology) as part of the baseline analysis. This analysis used provincial-level data to estimate growth in plastic demand as a function of population size coupled with per capita municipal solid waste (MSW) generation.

The findings are also informed by scenario analysis modelling techniques based on the Pew Charitable Trusts and SYSTEMIQ's Breaking the Plastic Wave report. This model presents a business-as-usual (BAU) scenario that assumes no interventions are made to current plastic-related policy, economics, infrastructure or materials and that cultural norms and consumer behaviour do not change. Under a system change scenario (SCS), two options are considered: ***realistic*** and ***ambitious***.

Analysis showed that if the aggressive-yet-***realistic*** SCS is implemented, unmanaged waste decreases from 42% in 2018 to 9% by 2030. Consequently, plastic leakage into waterways drops by 43%. Meeting the significantly more aggressive targets of the ***ambitious*** SCS leads to a 75% reduction in plastic leakage into waterways from 2018 levels, which is in line with the National Action Plan for Management of Marine Plastic Litter by 2030. Figure 1 below provides a comparison of the business-as-usual scenario and the ***realistic*** SCS.

Figure 1: The fate of plastics in Viet Nam under business-as-usual and *realistic* SCS



The three major interventions identified are: (i) a reduction and substitution of plastics, (ii) the expansion of economically viable recycling capacity and (iii) an expansion of MSW collection and safe disposal. Some of the key actions and related outcomes of the ***realistic*** SCS are highlighted below:

1. **Reduction and Substitution of Plastics.** Includes reduction efforts through elimination, reuse and new delivery-model levers to replace one million tonnes (13%) of avoidable plastic, and substitution efforts, such as switching to paper packaging, to replace 0.66 million tonnes of difficult-to-recycle plastic (which would have resulted in 9% of business-as-usual plastic waste). However, a life cycle assessment (LCA) must be conducted for any alternative materials before implementing substitution.

2. **Expansion of Economically Viable Recycling Capacity.** Includes increasing plastic collected for recycling from 11% to 38% by 2030 through the implementation of price incentives or other extended producer responsibility (EPR) tools, such as recycled content targets or advanced fees, to enable economically viable recycling for a growing proportion of post-consumer plastics. Complementary actions required include design-for-recycling, proper implementation of source segregation, the expansion of mechanical recycling capacity, and recognition of and capacity building for the informal economy. If properly executed, this intervention could result in a 466% increase in MSW plastic collected for recycling in Viet Nam (from 0.39 million tonnes in 2018 to 2.20 million tonnes in 2030).

3. **Expansion of MSW Collection and Safe Disposal.** Includes increasing waste collection volumes by 61% nationwide by 2030 (in order to increase waste collection coverage to 95% and 80% in urban and rural areas respectively), expansion of engineered landfill capacity by an additional 164 million tonnes between 2018 to 2030 and reducing littering from an estimated 5% to 3%.

The more ***ambitious*** SCS to reduce marine plastic litter by 75% requires an even stronger push on all fronts, ramping up the intensity and speed of all the actions outlined. This report explores this more ***ambitious*** approach to identify the required interventions as well as the scale of effort (both operational and financial) to achieve national targets.

Multiple actions led by multiple actors

A 43% reduction in plastic leakage to waterways could be achieved in 2030 if immediate and collective action is taken by key actors across the public and private sector. This would require a broad policy framework that identifies the responsibilities and specific actions for each intervention. Examples of possible policy options for these interventions are presented in Table 1.

Table 1: Stakeholders in system change scenario (SCS) interventions

Interventions	Action	National/ Local Government	Consumer	Plastics/ Good Industry	Waste Management Company	Informal Waste Management Sector
Reduction and Substitution	Product bans on single use plastics and hard to recycle items	✓✓	✓	✓		
	National packaging standards that outline the minimum requirements for packaging while outlawing excessive plastic usage	✓✓	✓	✓		
	Incentivizing industry efforts to develop new delivery models and expand reuse	✓✓	✓✓	✓		✓
Expansion of Economically Viable Recycling Capacity	Regulations on design-for-recycling	✓✓		✓✓		
	Regulations on use of recycled plastic	✓✓		✓✓		
	Regulations on EPR mechanism	✓✓	✓	✓✓	✓	✓
Expansion of MSW Collection and Safe Disposal	Clear targets and requirements for local authorities responsible for the actions to achieve improved collection and disposal	✓✓	✓		✓✓	✓
	Ensure necessary budgetary support	✓✓			✓✓	✓
Cross-cutting/ mainstreaming inclusivity*	Nationwide gender-targeted behaviour-change campaigns	✓✓	✓✓	✓	✓	✓
	Recognition and capacity building of informal economy in plastic waste value chain	✓✓	✓		✓	✓✓

Note: Key actors are indicated with two ticks ✓✓ while supporting actors are indicated with a single tick ✓

(*) Inclusivity mainstreaming interventions as a result of the gender equality and social inclusion assessments.

In addition to the establishment of a broad policy framework by the national government, the SCS and its interventions also require actions by multiple stakeholders without delay. This necessitates a set of government regulations to ensure effective implementation at an administrative level, enable innovation and promote investment, gender equality and inclusivity across the value chain, including in waste collection and recycling. Industry-led actions, such as investment into the recycling sector and a commitment to design for recycling that improves packaging end-of-life and guarantees offtake of recycled materials, are equally vital to ensure better recycling of plastic waste. The role of the informal economy in waste collection and recycling should be recognized and supported by the government and other sectors. In addition, women and other vulnerable communities affected by plastic pollution should be engaged as key agents of change in their roles as household waste users and managers, waste workers, policy regulators and market actors.

Key findings of this report

1. **Unmanaged plastic waste is a serious threat to Viet Nam's wellbeing.** It's estimated that the total mass of unmanaged plastics in Viet Nam under a business-as-usual scenario could grow from 1.53 million tonnes in 2018 to 3.15 million tonnes by 2030. This poses significant health risks to communities as estimates suggest it would double the open burning of plastics, leading to the release of more toxic chemicals, especially in rural communities where there is lack of formal waste collection systems. It could also lead to more plastic leaking into waterways, impacting popular tourism destinations, reducing fresh water and livelihoods for local communities and negatively affecting local seafood. Unmanaged plastics disproportionately harm marginalized communities, such as those with the least wealth. Sustainable solutions must put those most affected at the heart of decision taking.

2. **Business-as-usual will lead to significant growth in plastic waste leakage.** If current waste collection and treatment rates are maintained, it's estimated that the annual flow of plastic into waterways will grow from approximately 182,000 tonnes in 2018 to 373,000 tonnes per year in 2030. Furthermore, if waste collection and treatment capacities are not increased from their current levels, leakage is predicted to rise to around 768,000 tonnes per year. A large proportion of this increase would come from unmanaged plastic waste, with a staggering 66% generated in regions not covered by collection services in 2018 compared to 34% generated from areas with collections.

3. **Increasing the after-use value of plastic waste is one way to generate economic growth and to significantly reduce plastic leakage into waterways.** Most forms of plastic waste currently have little to no after-use value in the recycling market. They're also time consuming to collect. This includes flexible monomaterial and multimaterial plastics which respectively account for 55% and 27% of plastic leakage in Viet Nam in 2018. Currently, these types of plastic only represent 10% of material collected by the informal economy in Viet Nam -- the remaining 90% is more economically valuable rigid plastic. Product redesign and policy options, including extended producer responsibility (EPR) mechanisms, will significantly increase the after-use value of plastic waste. The Ellen MacArthur Foundation estimates that without redesign, 30% of plastic packaging (by total market weight) will never be reused or recycled.[1]

The informal economy is crucial in diverting plastic leakage from waterways. Without informal economy participation in the plastics value chain, the plastic pollution entering Viet Nam's waterways would be much worse. Informal economy collectors, a majority of whom are women, play a critical role in collecting plastic waste for recycling. However, because they operate outside the formal system, they lack access to equipment and facilities for their work, social welfare (such as occupational health) and safety and security protections (for example, paid maternity leave, sick leave, pensions or insurance). Waste collection is, moreover, viewed as the dirtiest and lowest-paid job in the country, typically undertaken by the poor and uneducated. Social norms and prejudice against this job is prevalent across Viet Nam. Many waste workers are from vulnerable populations: children, women aged between 50 and 70 with low incomes and migrants who have relocated from rural to urban areas. Recycling and waste collectors together gathered around 259,000 tonnes of plastic waste directly from residential areas, while landfill material pickers amassed 64,000 tonnes of plastics from engineered landfills, official dumpsites and open dumps in areas without collections. In total, this means that roughly 83%

of all plastic waste collected for recycling is found by informal economy workers. Improving waste management practices would support engagement with the informal economy and significantly expand economic opportunities for these communities. It's important to consider, however, that formalizing informal industries often benefits men over women, who generally secure the better protected and valued jobs even when women make up a bigger proportion of the corresponding informal sector. Therefore, any solutions must account for gender and other inequalities to ensure that marginalized communities who have been essential to the circular economy, benefit equally.

4 **There's no single solution to solve the problem.** Instead, it requires collective action. **A basket of upstream (pre-consumer, such as material redesign, plastic reduction and substitution) and downstream (post-consumer, such as recycling and disposal) solutions are urgently needed to solve Viet Nam's plastic leakage problem.** Current commitments made by the government and companies fall a long way short of solving this brewing crisis. Solutions must be differentiated by geography to reflect the varying characteristics of the country's many provinces, such as population densities, urban and rural populations, geographical features (for example, mountainous or coastal), citizens' diverse needs, consumption preferences and waste generation habits. They must also take account of existing gender and social inequalities, as well as gender norms, roles and power relations, which see women take on a large proportion of domestic labour and care work and have a greater influence over decisions related to purchasing, consumption and disposal of household plastics. Any solutions must address these differences to be successful. It's also equally important to understand the economics of plastic waste collection in Viet Nam in order to deal with the different types of plastic waste that lead to leakage into waterways.

As there are other programmes organized by partners and multilateral and bilateral development agencies tackling plastic waste, it's vital that action is coordinated to ensure harmonization and avoid duplication towards common goals. Furthermore, solutions should be conducted with a co-benefit approach in mind, resolving the plastic pollution problem but also addressing other developmental stressors, such as climate change, air and water pollution and impacts on nature.

Areas for further research

To provide the most detailed and representative picture, this roadmap's data sources include: publicly available reports, data and presentations; in-depth interviews with stakeholders; and consultation workshops. Available data points and assumptions have been reviewed with public and private sector experts.

Please see **appendix C** for data sources and assumptions and **appendix D** for data limitations and their impact on the baseline.

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There are four key areas where further research is recommended:

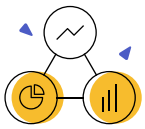
- **Data collection:** More recent data on plastics use and management in Viet Nam is recommended for the development of a more refined baseline. Data collection should include gender indicators where relevant and be disaggregated by sex and other demographic variables as appropriate.

  In addition, there's a strong need for improved and transparent data collection (design, standards and quality), sharing and management, not only for government agencies but also for businesses, NGOs and civil society. Technical support should be provided by experts and academia, and new data-monitoring technology implemented. Further research should also cover the topic of microplastics and its impacts.

- **Detailed policy analysis:** While this study highlights the enabling environment needed for the success of three system interventions, an in-depth analysis of existing policy and regulatory frameworks and the feasibility of policy-making and implementation was outside its scope. As next steps, a deeper intersectional and gender-inclusive policy analysis is recommended. This analysis should review the regulatory, institutional and policy framework in Viet Nam applicable to plastics, benchmark against good practices and provide recommendations and an action plan for improvement for the short, medium and long term. Within this, it's important that the intersectional gender policy analysis identifies implementation constraints for potential policy and regulatory reforms. Science-based policy-making should be emphasized in further research and policy development, with baseline analyses given high attention.

- **COVID-19 impacts on plastic waste management:** The COVID-19 pandemic has led to an increase in plastic use and mismanagement across the Asia-Pacific region and the world, particularly negatively impacting women and vulnerable populations. Future research is needed to better understand these trends in the context of Viet Nam.

- **Gender equality and social inclusion (GESI):** GESI are critical to achieving human rights and sustainable development, promoting economic growth, and reducing poverty and environmental degradation to improve health and food security[2]. Gender inequality and social exclusion should be addressed in transition to a new circular plastic economy – this is integral to GPAP's approach to solving plastic pollution[3]. As such, all new roadmaps, interventions and policies need to take gender equality and social inclusion-related issues into consideration systematically. Future research should, therefore, incorporate an intersectional gender analysis of plastics and waste management in Viet Nam. This baseline study will help assess and highlight critical gender and inclusion gaps and inequalities along the value chain and examine underlying gender and social inclusion constraints that inhibit the shift to a new circular plastics economy. The gender analysis baseline should also study the impact of waste mismanagement and waste pollution on women and other affected marginalized communities. This study can inform the further development of GESI policy considerations and recommendations, GESI action plans, and national action roadmaps and interventions in plastics waste management.



Future research should incorporate an intersectional gender analysis of plastics and waste management in Viet Nam. This baseline study will help assess and highlight critical gender and inclusion gaps and inequalities along the value chain and examine underlying gender and social inclusion constraints that inhibit the shift to a new circular plastics economy.

01 Introduction

1.1 General context

Through their durability, low weight, cheap price and wide range of uses, plastics have revolutionized the world. The convenience they offer, however, has created a throw-away culture with serious implications for the environment: to date, only 9% of all plastic waste has been recycled[4]; 12% has been incinerated, while the rest — 79% — has accumulated in landfills, dumpsites or the natural environment.[5] Plastic waste is expected to persist in the environment for hundreds of years and trigger health impacts through food chains. Plastic waste can block rivers and drainage systems, causing flooding, trapping stagnant water and increasing the spread of diseases. Open burning results in high levels of toxic chemical release and greenhouse gas (GHG) emissions.

Globally, it is estimated that approximately 5 to 13 million tonnes of plastic waste entered the oceans in 2010 - and that there could be up to 250 million tonnes of additional plastic entering the world's oceans between 2010 to 2025[6]. Eight out of the top 10 countries contributing to this plastic leakage are in Asia, with four specifically in South-East Asia. A widely cited international study estimated Viet Nam to be the fourth largest contributor, adding 280,000 to 730,000 tonnes of plastic to the ocean as part of an estimated 1.83 million tonnes of unmanaged plastic waste in 2010.[7]

Globally, it is estimated that approximately 5 to 13 million tonnes of plastic waste entered the oceans in 2010.

The baseline analysis for this report shows that, in 2018, Viet Nam generated over 3.7 million tonnes of post-consumer plastic waste, of which only 58% is properly managed. The remaining 42% causes considerable environmental harm. The study also estimates that 181,584 tonnes of plastic entered Viet Nam's waterways in that year.

On top of the environmental damage, the key gender equality and social inclusion issues inherent in the current linear plastics economy must be addressed in the transition to a circular economy too. Firstly, a lack of gender-disaggregated data and evidence means the health impacts for women and men, particularly those from marginalized communities, require further research. For example, in Viet Nam, waste management facilities, such as landfills and incinerators, are often located in less populated areas where many low-income families and marginalized communities live. As a result, these communities are more likely to be exposed to air, water, and soil pollution. This can have the knock-on effect of deepening social disparities, such as environmental degradation and health costs, and cause protests and tension among those affected[8].

Secondly, women's over-representation in the informal labour sector, when compared to the formal plastics waste management economy, means they not only receive lower recompense for their labour than men but also they have less influence over the plastic value chain. Informal workers are more likely to be exposed to waste pollution and toxins and confronted with sanitation issues, unhealthy working conditions and limited access to social benefits and fair pay[9].

Thirdly, women and under-represented groups are less involved in decision-making at the highest levels of policy, operations, planning and programme design, leading to an incomplete response to plastic pollution. Although the Law on Environmental Protection (2020) highlights gender equality as a critical guiding principle for framing conservation efforts, other sub-laws and policies remain gender-neutral and lack guidelines for gender mainstreaming and social inclusion. Furthermore, data and evidence on plastics pollution and plastic waste management related to sex and gender and their intersection with other identity factors, particularly on health and labour, are as yet unavailable. More research into the gender differences in consumer behaviour and unpaid labour related to plastics use and disposal is also required. Addressing gender inequality and social exclusion is central to the effectiveness and feasibility of this report.

Recognizing the growing environmental crisis presented by unmanaged plastic, Viet Nam has made strong political commitments, including:

- The *National Action Plan for Management of Marine Plastic Litter* (2019), which pledges to reduce the flow of plastics into the ocean by 75% by 2030[10]. The action plan addresses awareness raising and behaviour change, enhanced collection and treatment of plastic waste and control of the plastic leakage source, as well as the need for international cooperation, research and technology transfer on plastic waste issues.

- The *Law on Environmental Protection (2020)* and the corresponding sub-law decree has introduced regulations for the circular economy. Specific measures include: (i) reducing plastic waste by banning single-use plastics, especially plastic bags, promoting alternative environmentally friendly materials, limiting micro-plastic-containing products and controlling the import of plastic scrap; (ii) promoting recycling of products and packaging through an extended producer responsibility (EPR) mechanism; (iii) strengthening waste collection by enforcing segregation-at-source and pay-as-you-throw mechanisms and banning the discharge of plastic waste into waterways, and; (iv) promoting safe disposal of plastics by gradually limiting direct landfilling.

- The *Program for Strengthening Plastic Waste Management in Viet Nam (2021)* focuses on collecting, recycling and treating 85% of plastic waste by 2025. Relevant ministries are required to implement policy development, promote a circular economy model, amend taxation and control the importation of plastic scrap, while cities and provinces are called on to develop their own plans for plastic waste management.

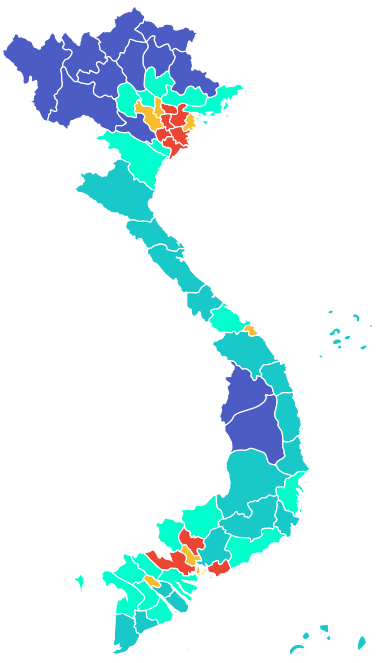
1.2 Methodology

The report has been developed by reviewing publicly available data, identifying key data gaps and stakeholders, conducting in-depth interviews to create the material flow analysis (MFA) and establishing insights to estimate a baseline for plastic leakage. The NPAP Experts Group, a coalition of over 70 leading experts from across sectors, guided the analysis and provided detailed feedback throughout the development of the roadmap. Consultation was carried out with individual experts, government and industry partners, and GPAP Steering Board members on a continuous basis, as well as through meetings of the NPAP Experts Group. The group convened for three key stages of the analysis: (1) baseline analysis, (2) system change scenario outcomes, and (3) after the first draft of the report. This final report is the result of careful adjustments made based on feedback received throughout the consultation process in 2020 and 2021.

The report uses the model developed in the **Pew Charitable Trusts and SYSTEMIQ's Breaking the Plastic Wave Report**[11] to estimate growth in plastic demand as a function of population size coupled with per capita municipal solid waste (MSW) generation derived from province-level data. Parameters for the potential scaling of the different interventions, estimated maximum foreseeable growth and implementation rates are based on historical trends. Key data areas include MSW generation, plastic consumption, plastic generation, littering, informal economy data in plastic waste management and unmanaged plastic waste (see more details at appendix C). To resolve differences in data availability, quality and uncertainty, a data pedigree scoring framework was developed to standardize uncertainty. This has been propagated through to the model outputs using a Monte Carlo simulation[12].

The report distinguishes five different archetypes based on population density, household income and distance to recycling hubs. The populations within each archetype are further classified as urban and rural to allow for variations therein. Proximity to water bodies was also considered within urban and rural populations to estimate potential leakage into waterways. The five archetypes used in this report are: municipality, mega province, medium province, rural province and remote province. A detailed breakdown of the basis of each archetype can be found in Appendix A.

Figure 2: Geographic archetypes used for NPAP system model and system change scenario



0.76	1.18	0.89	0.70	0.50	0.39
0.76 kg/capita/day National	kg/capita/day Municipalities	kg/capita/day Mega	kg/capita/day Medium	kg/capita/day Rural	kg/capita/day Remote

Waste-generation volumes per person are highest in wealthier archetypes, especially amongst the Municipalities (1.18kg/capita/day) and within the Mega province archetype (0.89/kg/capita/day); more than double the Rural provinces and Remote provinces archetypes.

75%	96%	83%	76%	35%	27%
Collection Coverage National	Collection Coverage Municipalities	Collection Coverage Mega	Collection Coverage Medium	Collection Coverage Rural	Collection Coverage Remote

Average plastic waste-collection is significantly lacking for Rural province and Remote province archetypes. **An estimated 74% of unmanaged plastic waste comes from Medium province, Rural province and Remote province archetypes in Viet Nam.**

Municipality Mega Medium
Rural Remote

Box 1: Intervention wedges

- **Reduce and substitute:** Reduction of plastic production and consumption. Sub-wedges include eliminating plastics (by design or policy options), consumer reuse models (switching from single-use items to reusable items) and new product delivery models (refill services, service as a product). Also, substituting with alternative materials that meet the functional requirements of the original plastic product with more easily recyclable or compostable materials. Alternative materials considered in this report are paper, coated paper and industrial- or home-compostable materials.

- **Recycle:** Recycling of products and materials. Sub-wedges include open-loop and closed-loop mechanical recycling, plastic-to-plastic chemical recycling and plastic-to-fuel conversion. These recycling systems produce new packaging, products and feedstock without the need to manufacture virgin plastic.

- **Dispose:** Controlled disposal of plastic waste that prevents leakage into the marine environment. Sub-wedges include engineered landfills, incineration or waste-to-energy facilities, sorting from compost facilities and plastic to fuel technologies. Any plastic waste that isn't treated through these processes is considered to be unmanaged and is most likely subject to open burning, direct dumping onto land or, worse, into waterways.

In accordance with the Pew Charitable Trust's approach, the current study assesses interventions using the wedges concept. Intervention strategies are identified as evidence-based approaches to flatten the rising curve of unmanaged plastic waste (Box 1). This multi-intervention approach will inform decision-makers across government, business, civil society and academia as they navigate their responses to this emerging global challenge, evaluate trade-offs and implement solutions. Only through a multi-intervention approach such as this can Viet Nam achieve its national target of 75% plastic leakage reduction by 2030.

Three major system interventions have been identified: (i) *reducing and substituting plastics,* (ii) *creating and expanding economically viable recycling capacity and* (iii) *expanding MSW collection coverage and safe disposal.* This report assesses the outcomes of varying the intensity of these three interventions. The outcomes are categorized under two scenarios:

- The **business-as-usual (BAU)** scenario, which doesn't apply the system interventions and consists of two approaches:

  - **Do nothing:** zero expansion of waste management infrastructure and capacity. Assumes no intervention is made in relation to current plastic-related policy, economics, infrastructure or materials and that cultural norms and consumer behaviours don't change.

  - **Maintain** current efforts: waste management capacity is expanded to maintain current rates (by percentage) of collection, recycling, landfill and leakage. Even though the current rates are maintained, due to a growing plastics market, the total tonnage of each process will increase.

- **System change scenario (SCS).** To solve the plastic leakage problem, a basket of upstream and downstream solutions is needed - referred to here as 'system interventions.' The SCS applies all three strategies to a range of plastic categories and different geographies and does so concurrently, ambitiously and starting immediately in order to redirect unmanaged plastic waste into environmentally sound solutions.

75%

Only through a multi-intervention approach can Viet Nam achieve its national target of 75% plastic leakage reduction by 2030.

1.3 In-scope plastics

This roadmap deals with plastics found in municipal solid waste (MSW), which represent up to 64% of total plastic consumption in Viet Nam[13] and include plastics such as discarded packaging and single-use products, consumer durables (household and institutional products and toys), hygiene products and nappies, and cigarette butts. This study estimates that 3.7 million tonnes of in-scope plastics were consumed in Viet Nam in 2018.

Out-of-scope plastics for this report include those not typically observed in MSW, such as plastic used in building and construction, industrial processes, textiles and transportation. Microplastics and sea-based waste such as materials thrown overboard from vessels or fishing activities are also out of scope. Additionally, the report omits plastic waste that originated outside Viet Nam having arrived by transboundary rivers and sea.

1.4 Data sources, data limitations and further research

The baseline analysis was the primary source of data for the modelling of scenarios. Other data sources included: the state reports provided by the National General Statistics Office; appropriate sectoral reports by relevant line ministries; publicly available reports, data and presentations; in-depth interviews with stakeholders; and consultation workshops. Available data points and assumptions have been reviewed by the NPAP Experts Group, which is made up of 70 key experts across the plastics value chain.

Please see **appendix B** for detailed information on the methodology and approach and **appendix C** for data sources and assumptions.

globalplasticaction.org/vietnam

A limitation of the current study is that many of the data points used were reported before and during the data collection exercise from late 2019 to early 2020. Consequently, it's recommended that this research is updated where possible to give a timely representation of the current situation and to address issues of gender and social equity. There's also a strong need for improved and transparent data collection (design, standards and quality), sharing and management, not only for government agencies but also for businesses and NGOs, utilizing the technical support of academia and new data monitoring technology. Further research should also investigate the impacts of microplastics. Please refer to appendix D for details of data limitations and their potential impacts on the study, along with an outline of the necessary future data collection, prioritized in order of their importance to developing a more refined baseline.

For additional research, it's important to review Viet Nam's existing regulatory, institutional and policy frameworks that are relevant to plastics. As highlighted, an assessment of the feasibility of policy making and implementation was outside the scope of work for this study. The current regulations should be benchmarked against good practices across the globe to develop recommendations that improve existing policies and regulations and help create a roadmap for implementation in the short, medium and long term. Science-based policy making should be emphasized in further research and policy development, along with paying close attention to the baseline analysis.

Strategies aimed at removing or capturing existing plastic litter from waterways in Viet Nam, such as the floating debris collection systems operating in Ho Chi Minh City,[14] have not been quantified in this analysis as data was only available for Ho Chi Minh City. Such strategies are, however, important to mitigate the amount of plastic litter in waterways. A deeper analysis of investments for technologies that capture plastics from major tributaries and rivers is, therefore, also recommended.

Further in-depth research on the impacts of the COVID-19 pandemic on plastic waste management against the post-pandemic economic recovery conditions in Viet Nam is also needed.

Finally, future studies should incorporate an intersectional gender analysis of plastics and waste management in Viet Nam. This baseline study will help assess and highlight critical gender and inclusion gaps and inequalities along the value chain and examine underlying gender and social inclusion constraints that inhibit the shift to a new circular plastics economy. The gender analysis baseline should also investigate the impact of waste mismanagement and waste pollution on women and other affected marginalized communities.

02

Plastic pollution poses an urgent challenge in Viet Nam

2.1 Fate of plastics waste in 2018

It's estimated that Viet Nam generated over 3.7 million tonnes of post-consumer plastic waste in 2018. Of this total, 42%, equivalent to 1.53 million tonnes, was unmanaged.

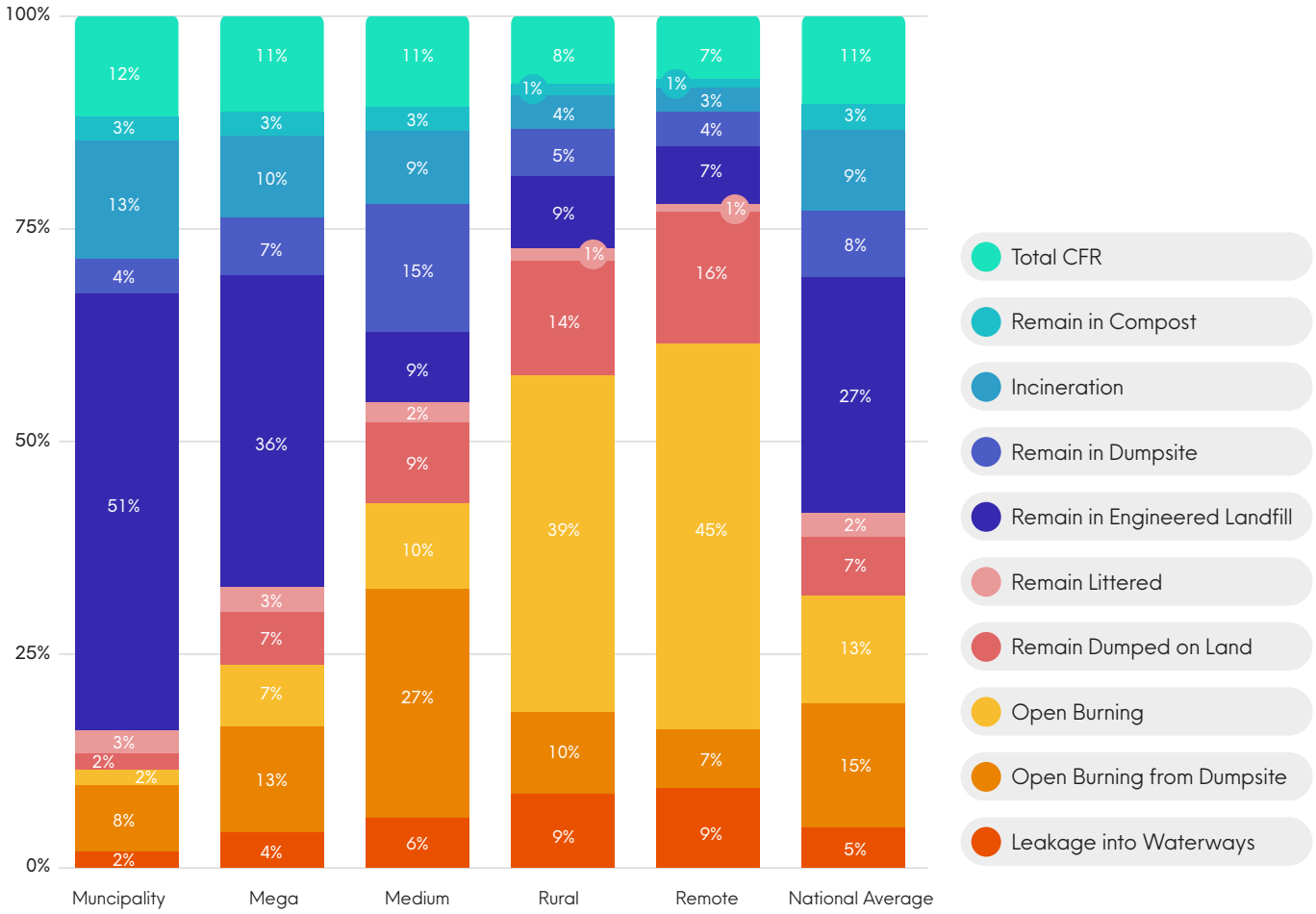
The baseline analysis found that of the 58% of plastic waste that was managed, the majority entered engineered landfills (27% of total plastic waste generated), with smaller amounts being collected for recycling (CFR, 11%), sent to incineration (9%), remaining in dumpsites (8%) or remaining in compost (3%). Figure 3 represents the fate of plastic in Viet Nam by national average and by archetype in 2018.

The remaining, unmanaged waste (42%) was mainly subjected to open burning (28% of total waste generated), discarded at dumpsites (15%) or produced by residents without formal waste collection facilities (13%). Other unmanaged plastic is dumped onto land (7%) or directly into waterways (5%). Approximately 2% of all plastic from collection coverage areas becomes land litter.

42%

42% of plastic waste was unmanaged.

Figure 3: Fate of plastic waste in Viet Nam in 2018 by archetype and national total



2.2 Leakage baseline and business-as-usual scenario for 2030

Maintaining current efforts would lead to a significant increase in plastic waste leakage into waterways of 106% between 2018 and 2030 - from 182,000 to 373,000 tonnes.

Figures 4 and 5 explore the fate of all plastics under the BAU ***maintain*** scenario. It's estimated that plastic leakage into Viet Nam's waterways would increase by 106% from 182,000 tonnes in 2018 to approximately 373,000 tonnes in 2030 if existing waste collection, recycling and treatment rates are maintained. Worse still, if the current waste collection, recycling and treatment volume is not increased (BAU ***do-nothing*** scenario), the plastic leakage into waterways would increase by 323% to approximately 766,000 tonnes by 2030.

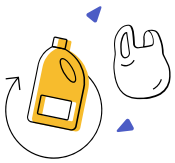


Figure 4: Fate of all plastic waste in Viet Nam to 2030 under BAU (maintain) scenario

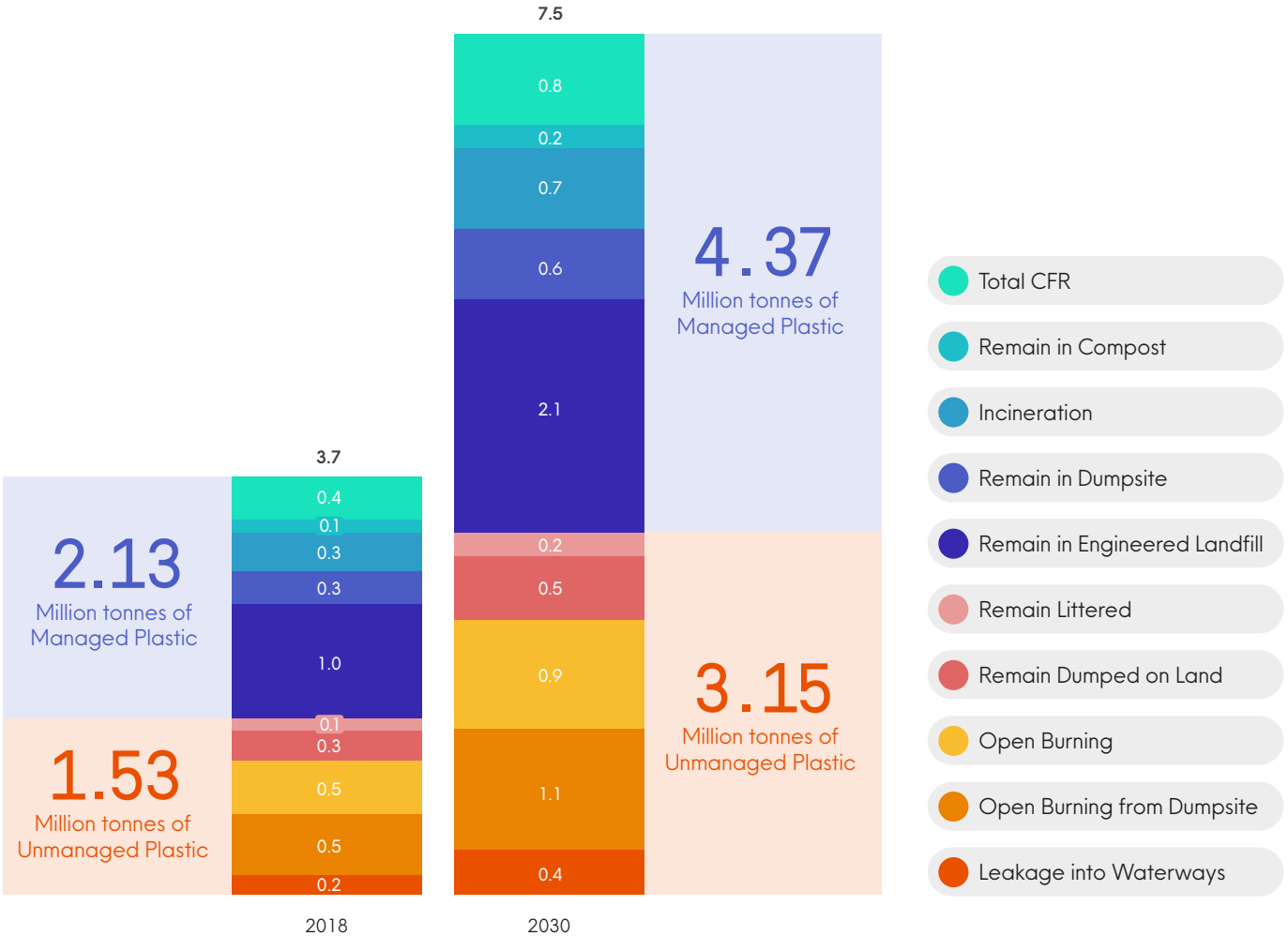
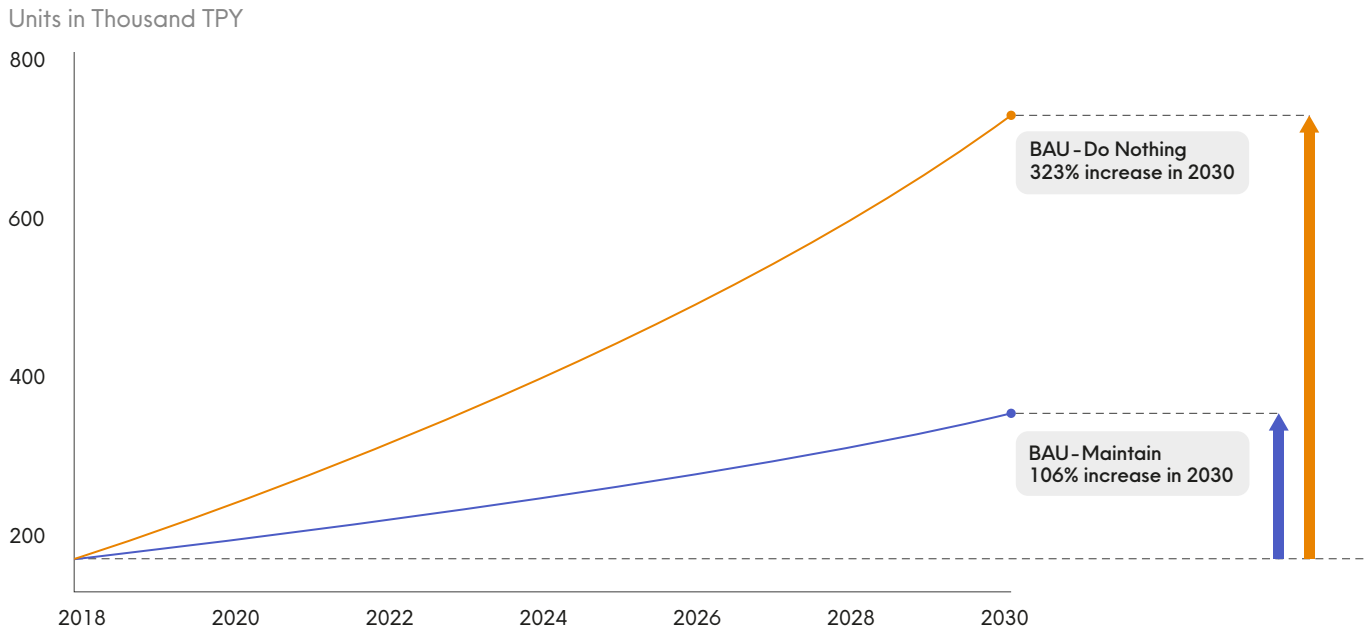


Figure 5: Comparison of total marine plastic leakage for BAU-maintain and BAU-do nothing



2.3 Impacts of plastic waste and its management

2.3.1 Environmental and socio-economic impacts from plastic waste

Plastic leakage into Viet Nam's waterways threatens marine life, tourism, drinking water quality and the health and wellbeing of populations. It also impacts on gender and social equity.

Aquatic wildlife commonly ingests plastics that degrade into small particles known as microplastics[15,16]. Recent studies documented 386 marine fish species[17] and 257 freshwater fish species[18] that ingested microplastics. These microplastics amass persistent organic and bio-accumulative pollutants, such as mercury and polyaromatic hydrocarbons.[19, 20] These pollutants build up in the food chain, presenting a potential risk to human health. However, some studies suggest that the impact of this exposure pathway to biota is limited[21] and that the health concern for human exposure to pollutants from ingestion of microplastics from food or drinking water is likely to be limited[22,23]. Although there's a critical lack of high-quality and credible studies to permit robust assessment of the environmental and human health risks posed by microplastics[24], the evidence that's emerging is troubling. This includes studies of the physiological impacts on freshwater fish species[25], plastic serving as vectors of pathogens and toxic chemicals, and microplastics found in human placentas[26].

The annual average seafood consumption by a Vietnamese individual is 27kg,[27] higher than the global average consumption rate of 22.3kg per capita per year.[28] Reducing plastic leakage into waterways may minimize the risk of detrimental health effects from plastic ingestion. In fact, a 2019 study of a commercially valuable seafood in Viet Nam, the Asian green mussel, found that the mussels sampled from Tinh Gia, Thanh Hoa contained microplastics.[29] Although the effects of microplastic ingestion on human health is still unknown, research has shown that microplastic

ingestion by zooplankton causes decreased nutritional intake which affects growth rates and reproductive output.[30] In acknowledgement of the potential health effects, the Vietnamese government listed plastic marine litter and microplastics as two of the 21st century's biggest global challenges, alongside climate change, ocean acidification and biodiversity loss, as part of their submission to the Experts Group on Marine Litter and Microplastics.[31]

Ocean plastic leakage also has socio-economic impacts. Plastic litter in oceans that washes up on shores fouls beaches and discourages tourists, leading to reduced revenues and employment opportunities in the tourism sector. With many low-income communities relying on tourism income, plastics pollution is threatening their sustainability. This may result in increased urbanization as local communities are forced to migrate to cities for work. Plastic waste influences fishing catch, too, particularly for inshore small-scale fisheries that local women and small businesses often depend on.[32]

Plastic entering river systems can also affect local communities' sources of income and fresh drinking water. For example, Phu Quoc Island in Kien Giang province is highly attractive to both local and foreign travellers for its clear waters. With the influx of tourism in recent years, the Duong Dong, a source of freshwater for island residents, has been impacted by plastic leakage.[33] Effective prevention and management of plastic leakage will be essential to maintain the island's popularity as a tourist destination. Plastic blight on riverbanks and seashores, particularly in tourist areas, devalues the quality of recreational services and the aesthetic beauty of these areas.[34]

Dumps and incineration sites are usually located in less populous areas where most marginalized and poorer communities live. Residents living in and around these sites must deal with air, water and soil pollution that affects their health and wellbeing. This has led to protests by affected communities against the operation of landfills in their locality - for example, at Nam Son dumpsite in Soc Son, Hanoi.[35]

In Viet Nam, men and women play different roles in plastic value chains as consumers, waste workers, policy regulators and product innovators. Gender risks, exposure to plastic pollution and health outcomes are, therefore, different due to multiple biological, social, economic and cultural factors. For example, due to prevailing gender norms which place the burden of unpaid domestic work (shopping, cooking, cleaning and care work) on women, the majority of MSW household plastics are purchased and disposed of by women. Female waste workers are disproportionately involved in performing more skilled and mentally demanding collection and recycling tasks, such as sorting, cleaning and separating waste, that presents greater exposure to waste pollution. Meanwhile, men carry out more physically taxing work, such as loading or unloading and transporting waste, and receive a higher income for it.[36]

Informal waste pickers live and work under dangerous and unhealthy conditions and suffer from extreme poverty and many forms of discrimination. Women waste pickers often don't have protective clothing or equipment. Moreover, waste collection is viewed as the dirtiest and lowest-paid job in Viet Nam, typically undertaken by the poor and uneducated. Most landfills in Viet Nam have poor sanitary conditions and do not meet labour safety standards. On top of this, Most of informal workers have no access to social and health insurance, nor information about labour rights or regulations on workplace hygiene and safety[37]. Consequently, gender-specific health risks related to exposure to plastic waste and microplastic by waste workers and consumers still need further research.

Photographs of plastic leakage into waterways throughout Viet Nam.[38]

Plastic floats near the salt field in Sa Huynh, Quang Ngai.

Plastic trash in Hon Ngang island, Nam Du district, Kien Giang.

Local child picking up recyclables in Binh Thuan.

Passing through the roadside dumpsite in Nam Du island, Kien Giang.

A heavily littered beach in Khanh Hoa.

A local boat dock in Binh Thuan.

Photo credit: Lekima Hung

2.3.2 Environmental health risks from plastic waste mismanagement

Plastic waste burning, common in Viet Nam, is harmful to human health and the environment as it releases toxic substances into the air. Uncollected plastic waste can also block drainage systems and potentially cause flooding and spread diseases.

The baseline analysis estimated that at least half of uncollected waste (51%) is openly burned.[39] The total amount of plastic burned in 2018 is estimated at 995,000 tonnes, with 462,000 tonnes burned by residents with no waste collection services and 533,000 tonnes burned at dumpsites. In a BAU *(maintain)* scenario, this volume will increase to two million tonnes by 2020.

The burning of plastic waste releases toxic substances, such as dioxins and furans, which at exceedingly high concentrations are harmful to human and animal health, vegetation and the environment.[40] Many of these substances are carcinogenic and when people are exposed to high concentrations for extended periods of time, they can cause serious health problems and even death. Dioxins, associated with the burning of plastic waste, are extremely carcinogenic and have a particularly negative impact on women in Mexico[41]. As open burning doesn't allow for complete combustion, carbon-dense materials such as plastic release aerosols which have an exponentially higher global warming potential when compared to the most common greenhouse gas, CO_2.

Importantly, poor management of plastic waste can result in it entering nearby water bodies, resulting in blocked drainage systems and eventual flooding, as well as blocked irrigation systems such as irrigation pumps. Blocked drainage can also cause the spread of diseases due to the trapped pools of stagnant water.[43] As many communities rely on the water bodies as a source of drinking water, flooding and stagnancy also cuts off these sources.

Photograph of open burning of plastics and other waste near the incineration plant in Binh Ba island, Nha Trang.[42]

2.4 Sources of plastic leakage

Plastic leakage in Viet Nam comes mainly from areas with no waste collection coverage in medium and rural province archetypes where flexible monomaterials and multilayer/multimaterial-plastic products are the major types of plastic waste.

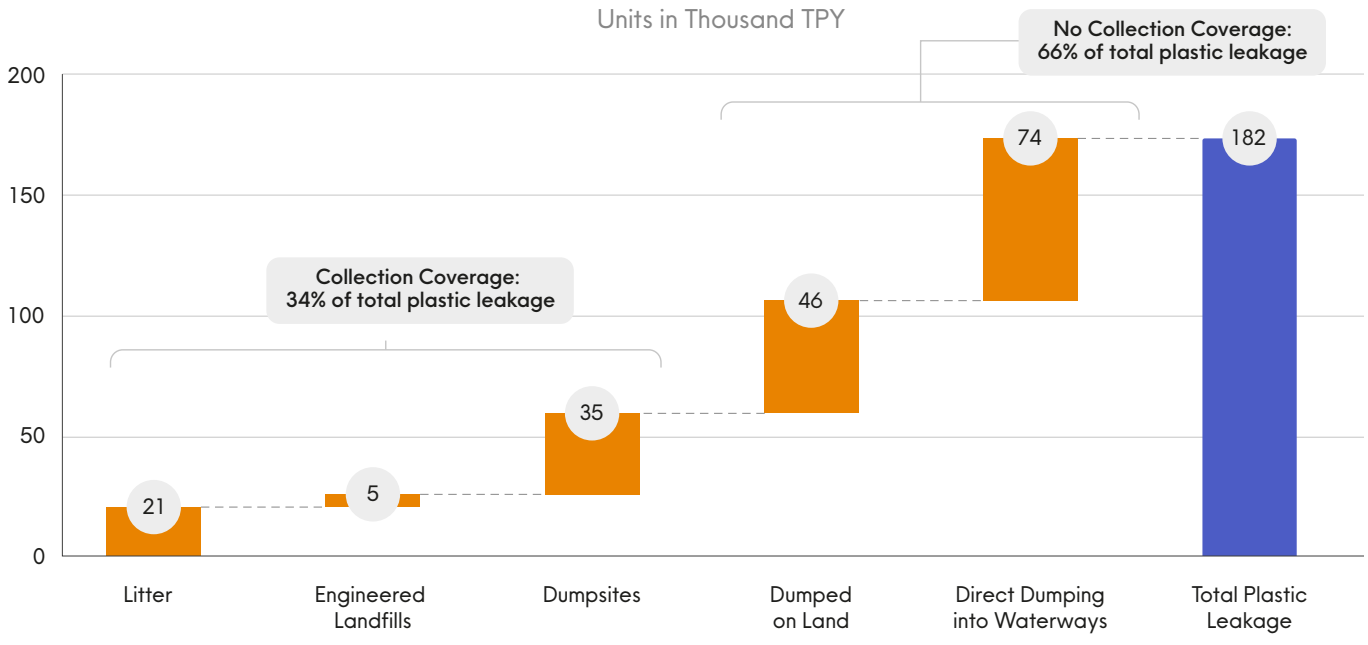
Based on analysis of waste flows in Viet Nam, five major land-based sources have been found to contribute to marine plastic leakage into waterways.

Table 2: Classification of plastic leakage into waterways sources

1 Plastic leakage from areas with waste collection	2 Plastic leakage from areas without waste collection
• Plastic leakage into waterways from litter • Plastic leakage from engineered landfills • Plastic leakage from dumpsites	• Plastic leakage from plastic dumped on land • Plastic leakage from direct dumping of plastic by residents into waterways

This report estimates that of the total 182,000 tonnes of plastic leakage in 2018, 120,000 tonnes (66%) came from areas with no waste collection coverage, mainly due to the direct dumping of plastic waste into waterways (74,000 tonnes) or onto land (46,000 tonnes). Areas *with* waste collection services (representing 75% of the population) still leak 62,000 tonnes (~34%) of plastics, mainly from dumpsites, littering and engineered landfills (Figure 6), despite the latter being considered safe disposal sites.

Figure 6: Plastic leakage into waterways within MSW collection and non-collection coverage areas



Dumpsites are essentially unsanitary and unprotected landfills without suitable fencing, coverage, leachate management and landfill gas management. Most importantly, they're usually in unsuitable locations, such as alongside waterways, thus they tend to exhibit high leakage rates. Residents living in impoverished and marginalized communities near dumpsites suffer air, water and soil pollution with the associated environmental degradation and health costs.

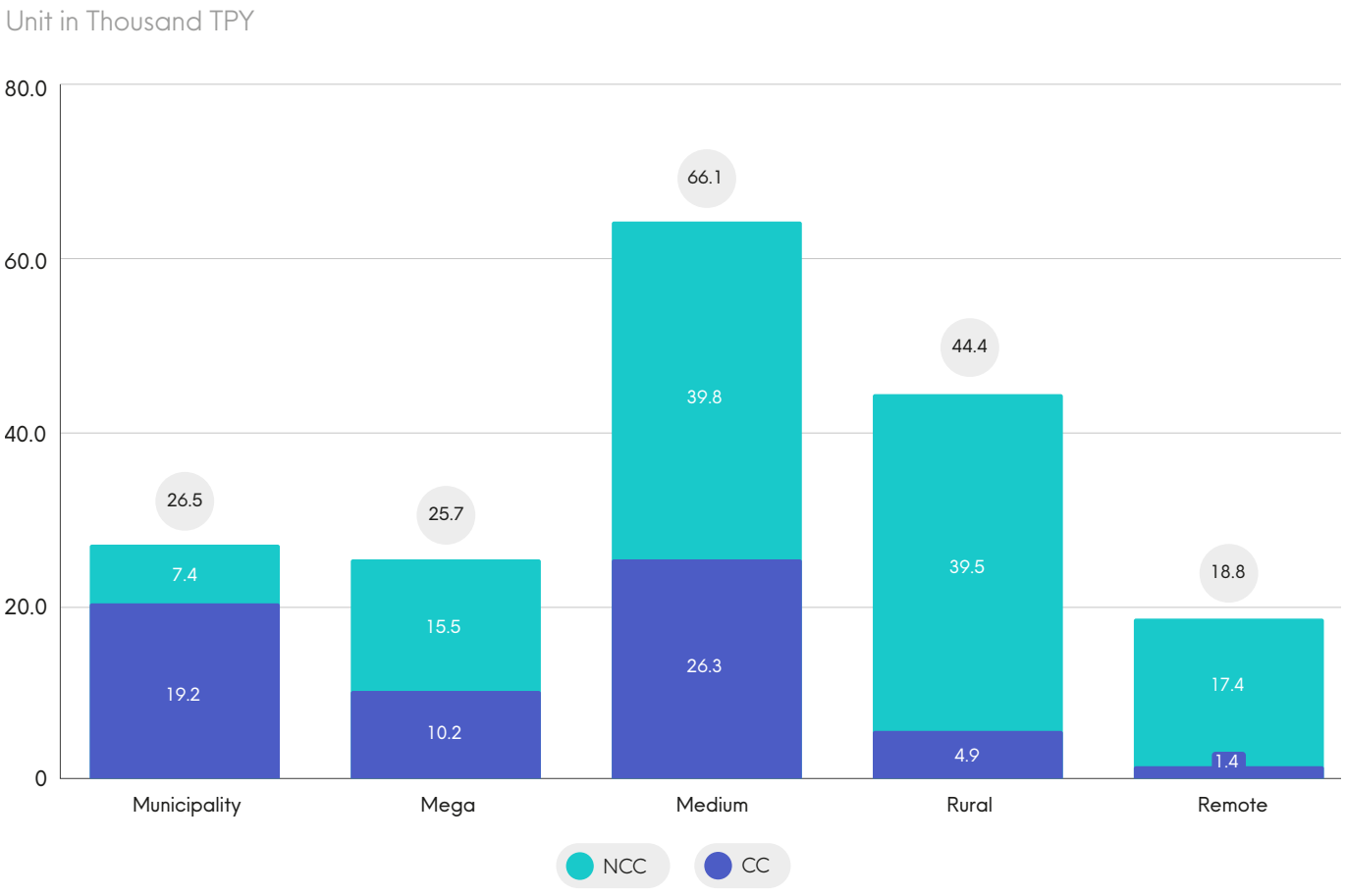
For the areas with no waste collection coverage (representing 25% of Viet Nam's population)[44], the direct dumping of MSW and plastic waste by residents into waterways or onto land is the primary cause of leakage. In the absence of proper collection services, residents are left with few options, and those that exist, such as open burning or burial into waste pits, are equally harmful. MSW dumped on land often runs off into waterways gets is carried into them during floods caused by heavy rains that are typical to this region.

Of waste that is not collected, this study estimates that the majority is burnt (51%), while approximately 13% of uncollected plastic waste ends up in waterways because of direct dumping or the transfer of waste from land to water.[45] Only 6% is collected for recycling by informal economy collectors. The remaining 30% is dumped on land.[46]

Figure 7 provides a breakdown of plastic leakage into waterways in 2018 per archetype for areas with and without waste collection coverage. As can be seen, the medium province and rural province archetypes contribute the most annual plastic leakage into waterways at a combined rate of 61% (approximately 111,000 tonnes) in 2018.

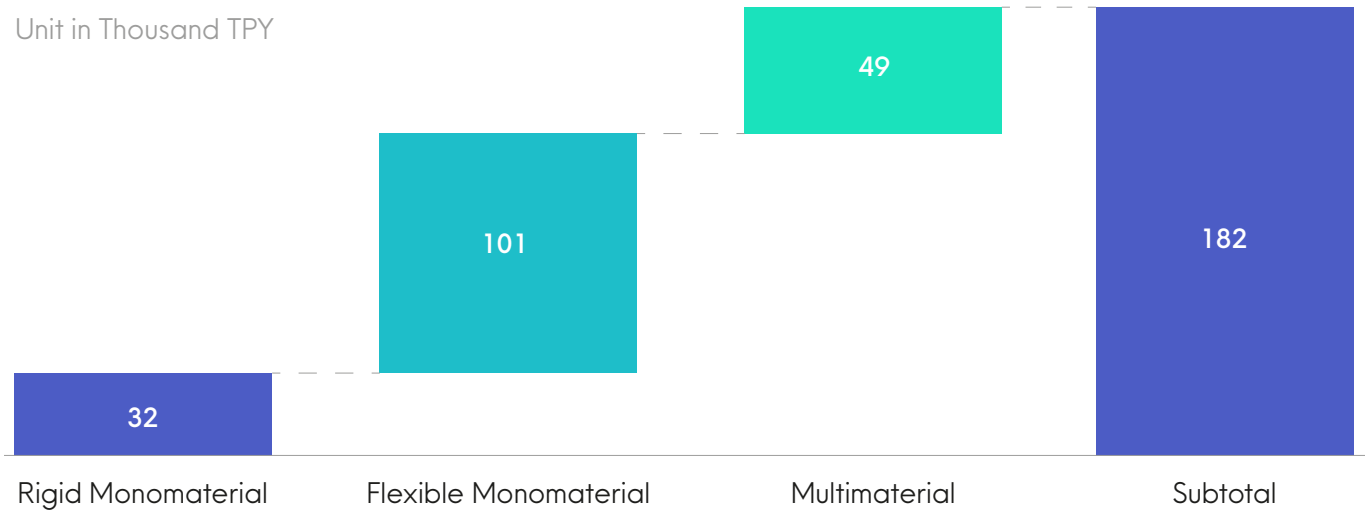
For the areas with no waste collection coverage (representing 25% of Viet Nam's population), the direct dumping of MSW and plastic waste by residents into waterways or onto land is the primary cause of leakage.

Figure 7: Comparison of total marine plastic leakage and distribution between archetypes in 2018



Flexible monomaterials, such as films, wraps and bags make up 55% (approximately 101,000 tonnes) of leakage and multilayer/multimaterial plastics, such as sachets, nappies and drinks cartons, make up 27% (approximately 49,000 tonnes). Rigid plastics only account for 18% (32,000 tonnes) of plastic leakage into waterways (Figure 8).

Figure 8: Comparison of total marine plastic leakage and distribution between plastic types



2.5 The causes of plastic leakage in Viet Nam

Viet Nam has five **interconnected** root causes for plastic leakage into waterways:

1. **Underdeveloped solid waste collection and management systems.** The lack of waste collection services generates the most plastic leakage and environmentally harmful waste disposal. Additionally, where there is collection coverage, a significant amount of the waste is disposed of at dumpsites instead of safe engineered landfills. Translating national policies for solid waste management into improved practices at the municipal, provincial and city level is challenging due to several interconnected factors, including:

- **Existing waste collection operations are labour intensive and inefficient.** The existing waste collection system includes push-cart collection where waste workers manually push wheeled carts through residential areas to collect bagged waste. This waste is then aggregated at a transfer station before it is sent to treatment facilities.[47] Informal waste pickers, particularly women, lack access to facilities, equipment, credit to buy equipment and land for storage. Hence, their work is more labour intensive and lower paid than formal workers, who are generally men[48].

- **Waste collection fees paid by consumers are insufficient to cover operations.** The international norm for waste collection fees paid by consumers is 1% to 1.5% of household income. However, previous research has shown that the average monthly fee paid in Viet Nam is less than 0.5% of household income.[49] In fact, total collected fees cover less than 60% of the overall waste management cost.[50] Consequently, the remaining costs are borne by already under-resourced local governments, thus hindering service coverage and quality.

- **Lack of infrastructure to deal with segregated waste.** Even when waste is segregated at source, cities such as Ho Chi Minh City and Danang lack the necessary infrastructure to handle and treat segregated waste.[51] This means that segregated waste is often disposed of together with mixed waste. This lack of

infrastructure also discourages people from segregating in the future.

- **Poorly managed waste treatment facilities.** Although Viet Nam has 660 landfills, only 204 (31%) are considered engineered landfills.[52] The remaining 456 (69%) are effectively dumpsites that have minimal to no controls and are thus highly polluting to nearby water bodies and settlements. These dumpsites range from semi-controlled sites (where some directed placement of the waste occurs but without engineering measures, such as daily covering, fencing, leachate management or landfill gas management) to open dumpsites (where there is no control and waste is regularly burned).[53] The sites are often located close to waterways which leads to high run-off of plastic into the waterways. The dumpsites are typically closer to marginalized or informal communities, further magnifying disproportionately negative impacts[54].

- **Plastic collected for recycling (CFR) is driven by the informal economy.** Research suggests that in 2018, the informal economy collected the majority (83%) of plastic waste collected for recycling. Municipal waste service operators derive less than 20% of their income from waste fees (paid by households), with the balance paid by local administration subsidies. With the informal economy recovering a significant amount of high-value plastic recyclables, it is challenging for the municipal waste operators to capture the recyclables value and generate revenue from recycling services.

2. **A lack of source segregation which hinders the diversion of plastics to recycling.** Without plastic waste segregation, most plastic is sent to engineered landfills and dumpsites, incineration and waste-to-energy plants or sorting facilities that support composting. Most of the sorting and segregating takes place after disposal - in other words, from a stream of mixed waste. This not only makes recovery difficult, but it also leads to the contamination of plastics that could be recycled.

   At the household level, some people set aside recyclable waste to be sold or given away to recycling pickers or junk shops. Because women make up 85% of domestic purchases decisions, they have a more significant influence on household waste management and waste segregation at source.[55] However, current policies and programmes often overlook the role of women in waste management. In addition, people face many barriers to at-source segregation, including a lack of legislation and specific guidelines on waste sorting at source, a lack of sorting infrastructure and equipment, such as separate containers for different waste types, and a lack of awareness or incentives for waste sorting[56].

   Sorting and picking out is generally conducted by informal economy workers, most of whom are women. While there are a few pockets of formal source segregation, attempts to increase these efforts are hindered by an absence of separate treatment facilities for different materials and poor enforcement of continued segregation behaviour. Without widespread segregation of plastics, either at source (by households and businesses) or on collection (through formal sorting centres), less plastics can be diverted from dumpsites and landfills. The fate of plastics in areas that lack collection coverage is even worse unless the informal economy recovers at least some portion of disposed waste.

Box 2: Reliance on the informal economy to divert plastic leakage

Informal economy collectors play a critical role in gathering plastic waste for recycling. This report estimates that, in 2018, the informal economy collected approximately 323,000 tonnes of plastic waste (83% of the total plastics collected for recycling) with 186,000 tonnes of that coming directly from collectors in residential areas and 137,000 tonnes recovered from the MSW waste collection process, transfer stations, landfills and dumpsites.

Without informal economy participation, the quantity of plastic waste entering Viet Nam's waterways would be even higher. However, it isn't sustainable to rely on the informal economy unless interventions are implemented to support it. As countries develop, the number of informal economy workers declines and that leads to a corresponding drop in the collected-for-recycling rate[57]. As the average cost of living increases, collecting and selling plastics no longer provides sufficient income. Consequently, informal economy workers move onto other jobs. This poses a significant challenge for the Vietnamese government: achieving the improvements in formal source segregation necessary to meet plastic leakage reduction targets will take time, so the informal economy remains vital.

The informal economy also faces other challenges and bottlenecks in collecting for recycling, including:

- **Low financial security and price insurance.** Pickers, small junk shops, scrap businesses and other parts of the informal economy have limited access to loans and funds. Many businesses operate on tiny margins and must take loans to continue their operations, especially as scrap material prices are volatile. Moreover, with limited bargaining power they cannot negotiate with buyers who often cut buying prices without notice.

- **Limited collection of low-value plastics due to low market value.** It's a material's value that matters most to informal economy collectors. As such, almost all lower value and lighter items of plastic waste remain uncollected. Focusing system interventions on materials that currently aren't collected is therefore a top priority if nations want to reduce the negative environmental impacts of plastic waste.

- **Little recognition of the informal economy's importance to waste management.** Despite the sector's dependence on informal economy workers, their efforts often go unrecognized. Local governments and communities tolerate the activities of informal collectors but don't actively integrate their services let alone compensate them fairly. Informal waste workers lack access to new technology, equipment, finance and training, as well as any incentives for plastic waste collection provided by government programmes.

- **Inadequate government support.** The government offers little support to the informal economy, and this is especially challenging for workers during economic downturns or disruptive market events, such a drop in oil prices or a global pandemic. Without specific government support, recovering from such market events is especially difficult for informal economy workers.

- **High gender inequality.** Women play a major part in the informal economy: 84.6% of street recycling pickers in Viet Nam are women[58]. Men tend to work at night in remote sites like waste dumps or factory sites when most garbage trucks arrive, securing better pay. Because of this, on average, women in the informal economy are paid only 78% of men's earnings[59]. Women in the plastic waste value chain also face more severe health risks as they're in physical contact with toxic gases, bacteria, parasites and a dust level that's three to seven times above the designated standards. Around 52% of waste collectors contract diseases like dengue, flu and dermatological issues, and 28.6% are prone to bronchitis and lung diseases (Environment and Development in Action in Ho Chi Minh City)[60]. Occupational accidents, such as hand injuries, are more likely for female waste collectors (94.6%), as are traffic accidents (23.6%)[61]. No data on the rate of gender-based violence or sexual harassment against female pickers during work has been recorded; however, current data on violence against women and girl[62] and sexual harassment in public place[63] in Viet Nam shows that women working in the plastic waste value chain more generally are equally affected.

Box 2: Reliance on the informal economy to divert plastic leakage (continued)

- **Social inequality and health risks.** Waste collection is viewed as the dirtiest and lowest-paid job in Viet Nam, typically undertaken by the poor and uneducated. Many workers are women aged 50 to 70, children of all ages and migrants from rural to urban areas. Negative social norms and prejudice against those performing this job are endemic. Both men and women waste workers are forced to confront disrespect from their fellow citizens. 97.9% of informal workers have no access to social and health insurance, no labour rights and no workplace hygiene or safety regulation[64]. The informal economy is not included in the making of policy for waste management or any other area. Informal waste pickers rarely have protective clothing or equipment, while most landfills in Viet Nam have poor sanitary conditions and don't meet labour safety standards.

3 **Excessive use and problematic plastics.** Plastics are lightweight, affordable, easy-to-use, strong and flexible materials with numerous valuable applications. However, many of the current uses of plastics are avoidable or problematic, leading to unnecessary waste and leakage. An example of excessive use over the past decade can be seen in the boom of e-commerce and product deliveries, often with extensive plastic packaging, to hundreds of millions of doorsteps around the world. Another instance of avoidable plastics is the regular use of disposable tableware, even for on-premises dining, by food and beverage outlets in Viet Nam. The COVID-19 pandemic has also led to increased consumption of single-used plastics, such as food packaging and plastic bags,[65] as well as single-use facemasks and other PPE[66].

Problematic plastics include those with established negative health and environmental effects, such as PVC in packaging. PVC and other plastics, such as polystyrene and multi-layer plastics, contaminate the recycling process, reducing the viability of recycled products (PVC contamination makes it harder to create safe and high-value food-grade recycled PET). Other problematic plastics include the much-debated oxo-degradable plastics. These have been marketed as a solution to plastic waste, but they disintegrate quickly into microplastic particles and are considered by many to have a worse impact on ecosystems and recycling systems than standard plastics.

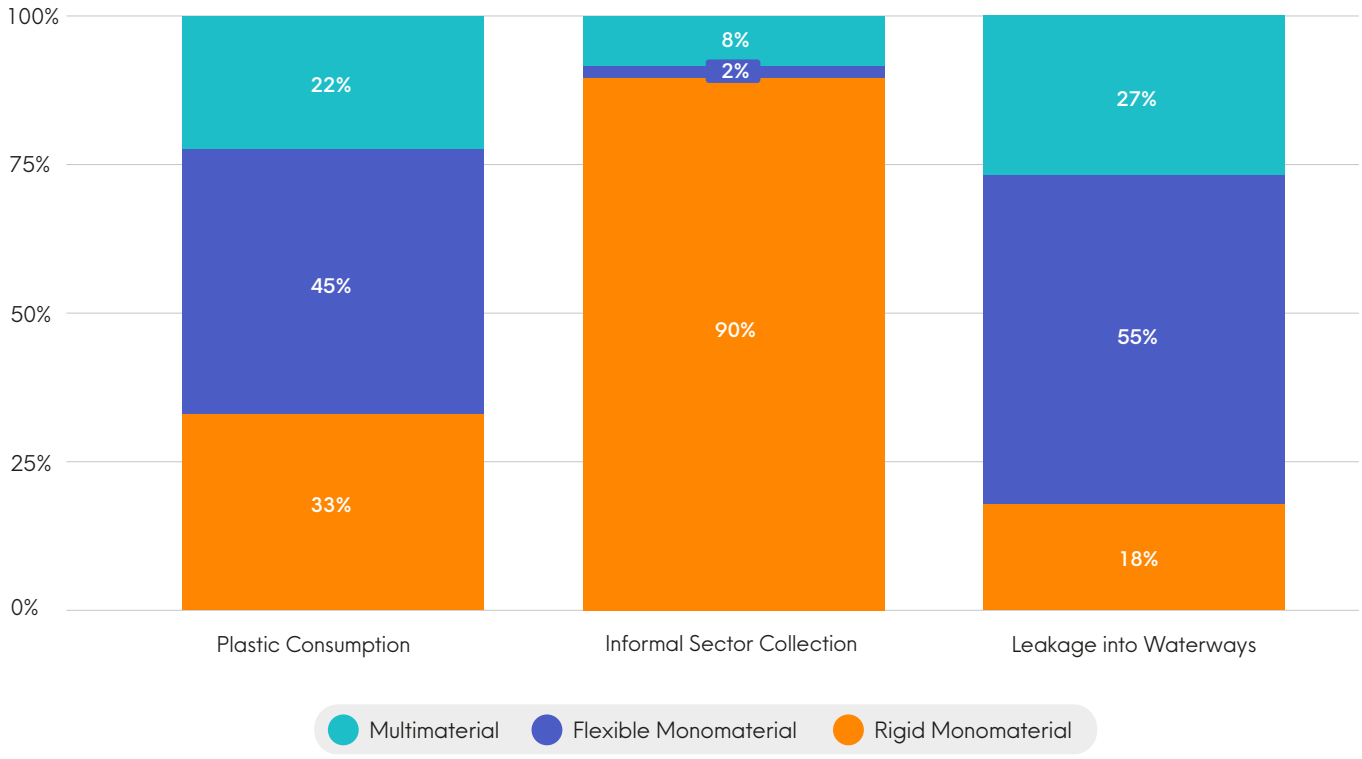
4 **Limited after-use value for many plastics.** Many forms of plastic waste, such as flexible monomaterial and multimaterial plastics, have low or no value in the recycling market and are time consuming to collect. Consequently, they're not favoured by informal economy collectors in Viet Nam. Multimaterial products, such as sachets and sweet wrappers, have very low market price for recyclers, if any at all. Informal collectors and recyclers focus on higher-value plastic recyclable, such as HDPE and clear, rigid PET. Results from the baseline analysis, that investigated the informal economy in Ho Chi Minh City and Hanoi, found that 90% of all plastics collected are rigid, while only 10% are flexible or multimaterial plastics (see figure 9 below).

Despite this preference for rigid plastics, the collection-for-recycling rate of rigid monomaterial plastics is still low - estimated to be just 28% in 2018. While PET bottles, as well as some rigid HDPE and PP plastics, are believed to be collected at rates above 28% (due to their higher street value), many rigid monomaterial plastics are collected at much lower rates due to their minimal value. Furthermore, only rigid plastics which are sufficiently close to recycling facilities are collected for recycling. Further away from a recycling facility, the higher transportation costs reduce the materials' value. So the vast majority of all plastics, including rigid varieties, are left uncollected (see image 8 below) and leak into waterways.

Photograph of uncollected rigid plastic waste in Viet Nam. Street filled with plastic cups in Binh Thuan Province.[67]

Photo credit: Lekima Hung

Figure 9: Plastic consumption, informal economy collection and plastic leakage by plastic type in 2018



5 Littering of plastics. Littering is a chronic problem for Viet Nam that, along with a more comprehensive waste management system, will require substantial behaviour change. It's estimated that there were 138,000 tonnes of waste littering areas with collection coverage and 74,000 tonnes in areas without collections or dumped directly into waterways in 2018. Of the former figure, it's estimated that 21,000 tonnes leaked into waterways.

The Vietnamese government has recognized littering as a significant issue. In 2016, the city of Hanoi passed a regulation imposing heavy fines of up to VNĐ7 million ($310)[68] on people who litter in public areas, but enforcement has proved to be a challenge. Campaigns to address littering behaviour in Viet Nam are, however, showing some signs of promise. But it's as least as important to ensure that waste management infrastructure is in place to prevent litter and plastic leakage.

Having identified the sources of leakage and the reasons for the ongoing plastics problem, this report turns its attention to the potential system-change interventions.

138K

It's estimated that there were 138,000 tonnes of waste littering areas with collection coverage and 74,000 tonnes in areas without collections or dumped directly into waterways in 2018.

03

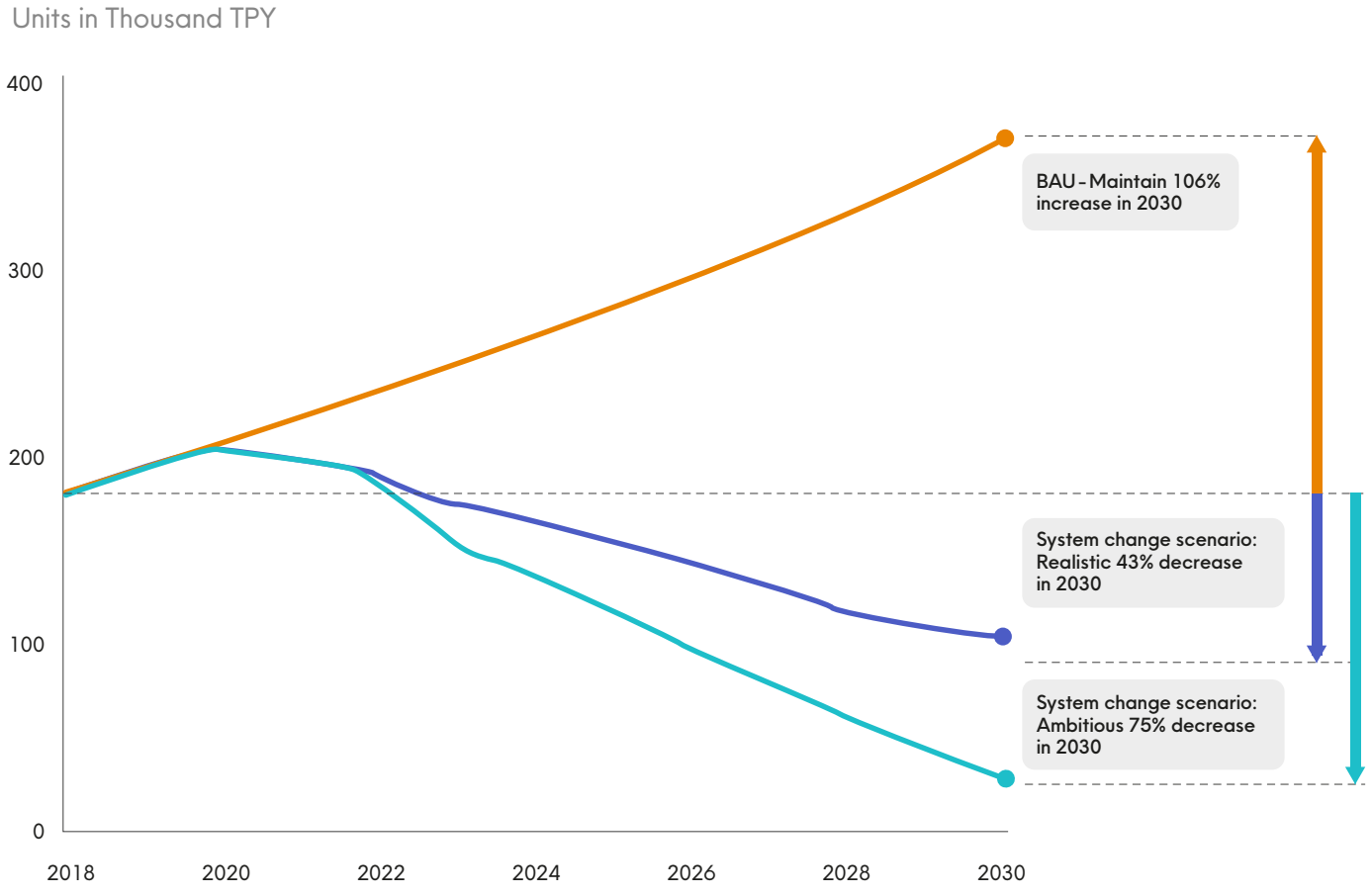
A system change and multiple interventions are urgentlly needed to reduce plastic leakage

3.1 Two system change scenarios and three interventions

To achieve the national target of reducing plastic waste leakage by 75%, Viet Nam needs an ambitious system change scenario (SCS). The realistic SCS delivers a 43% reduction with interventions on reduction and substitution, promoting recycling, and expanding collection and safe disposal.

Solving the plastic leakage problem in Viet Nam requires an ***ambitious*** basket of upstream and downstream solutions to be implemented immediately and concurrently. Following the ***realistic*** SCS could achieve a 43% reduction in plastic leakage in Viet Nam. The ***ambitious*** SCS would cut plastic leakage by the government target of 75%.[69] Both of these scenarios offer a significantly different future to the BAU maintain scenario, as can be seen in Figure 10.

Figure 10: Plastic leakage into waterways under three system change scenarios



Note: The BAU (do nothing) scenario isn't modelled here, as it is not a relevant comparison for the SCS. For plastic leakage under the do nothing scenario, see section 2.6.

The three interventions of the SCS are: 1) reduction and substitution of plastics, 2) significantly expand economically viable recycling, and 3) expand MSW collection coverage and safe disposal.

Table 2 summarizes the actions necessary for each of these three interventions for both the ***realistic*** and ***ambitious*** scenarios, as well as the achievements required to meet their goals by 2030. The key differences are found in the first and third interventions. For reduction and substitution, the ***realistic*** scenario is based on Pew's scoring for lower-middle income (LMI) countries in the *Breaking the Plastic Wave* report. In the ***ambitious*** scenario, the scoring used aligns with the Viet Nam government's intention to eradicate single-use plastic bags by 2025.[70] For waste collection coverage, under the ***realistic*** scenario, the collection coverage increases to a national average of 88% by 2030, whereas under the ***ambitious*** scenario it increases to 95% (Table 2).

Table 3: SCS interventions to be applied together and immediately

SCS interventions	Key actions / sub-interventions	Achievements by 2030	
		REALISTIC SCS (43% plastic leakage reduction)	AMBITIOUS SCS (75% plastic leakage reduction)
REDUCE: Reduction and substitution of plastics	Reduce plastic consumption via elimination, reuse and new delivery models	**13%** of plastic consumption can be avoided – equivalent to a 1.00 million tonnes reduction in 2030.	**26%** of plastic consumption can be avoided – equivalent to a 1.93 million tonnes reduction in 2030.
	Substitute plastics with suitable alternative materials: paper, coated paper and compostables	A further **9%** of plastic consumption can be avoided in 2030 – equivalent to a 0.65 million tonnes reduction in 2030.	A further **9%** of plastic consumption can be avoided in 2030 – equivalent to a 0.68 million tonnes reduction in 2030.
RECYCLE: Significantly expand economically viable recycling	Design products and packaging for recycling	By converting 50% of sachets and multilayer packaging to flexible monomaterial packaging, 5% of multimaterial household goods will be converted into rigid monomaterial.[71]	
		This is equivalent to a 0.55 million tonnes reduction in multimaterial plastics in 2030.	This is equivalent to a 0.44 million tonnes reduction in multimaterial plastics in 2030 (less than *realistic* SCS due to higher percentage in reduction – 26% compared to 13%).
	Increase source segregation	Increased source segregation nationwide to 4.5% of total plastic generated in 2030, with urban areas at 7.3% and rural areas at 1.4%. This will result in formal source segregation contributing to 12% of plastic collected for recycling in 2030.	
	Use policies and economic instruments to make the recycling system economically viable for growth	Increase plastic collected for recycling from the current 11% to 38% in 2030. This can be achieved by implementing price incentives, building capacity for the informal economy and the recycling industry, and other complementary interventions (expanding recycling, source segregation, design-for-recycling). With this, the plastic CFR increases from an estimated 0.39 million tonnes in 2018 to 2.20 million tonnes in 2030; a 466% increase.	
	Increase mechanical recycling capability and plastic to fuel conversion capacity	Increase mechanical recycling capacity by 1.79 million tonnes by 2030 from an estimated 0.8 million tonnes in 2018. This is equivalent to 60 new recycling facilities (assuming 30,000 tonnes capacity per facility) or 6 new facilities each year. Install plastic-to-fuel conversion capacity from 2025, increasing to a total of 0.02 million tonnes (20,302 tonnes) capacity in 2030.	
COLLECT & DISPOSE: Expand MSW collection coverage and safe disposal	Expand MSW collection coverage (up from 88% in urban and 62% in rural areas and a national average of 75% in 2018)	Increase waste collection coverage to 95% and 80% in urban and rural areas respectively by 2030, resulting in national coverage of **88%.**	Increase waste collection coverage to 100% and 90% in urban and rural areas respectively by 2030, resulting in national coverage of **95%.**
	Expand controlled disposal in order to eliminate dumpsites and improve engineered landfills to completely stop plastic leakage	Build an additional **164 million** tonnes of engineered landfill capacity, equivalent to 83 landfills with a two-million-tonne capacity each.	Build an additional **170 million** tonnes of engineered landfill capacity, equivalent to 85 landfills with a two-million-tonne capacity.
		Phase out leakage of plastics from engineered landfills by 2023 and **stop waste disposal to dumpsites** by 2028.	
	Significantly reduce littering Change public behaviour to significantly reduce littering	Reduce littering through campaigns, fines and cleaning from an estimated 5% in 2018 in collection coverage areas to 3% in collection coverage areas by 2030.[72]	

The authors and experts consulted as part of NPAP Viet Nam's Experts Group consider the ***ambitious*** scenario unattainable by 2030. It is for this reason that the following graphics and analysis present the ***realistic*** SCS unless otherwise stated. However, the ***ambitious*** SCS is highlighted where relevant.

There is a credible path for Viet Nam to significantly reduce plastic leakage to the ocean. However, it requires all solutions to be implemented concurrently, ambitiously and immediately. The total impact of scaling all interventions concurrently in the ***realistic*** SCS is shown in Figures 12 and 13 below. This scenario involves scaling up reduction levers to avoid 1.00 million tonnes of plastic waste (13% of the 7.52 million tonnes of plastic generated in 2030 under the business-as-usual scenario), growing substitution levers to replace 0.65 million tonnes (9% of business-as-usual plastic waste), expanding recycling levers to increase plastics collected for recycling to 2.20 million tonnes (29% of business-as-usual plastic waste) and disposing 2.99 million tonnes (40% of business-as-usual plastic waste) of the remaining plastic waste in controlled facilities. With this, the proportion of unmanaged waste will decrease from 41.8% in 2018 to 9.1% in 2030 under the ***realistic*** SCS. In the ***realistic*** SCS, plastic leakage reduces from approximately 181,000 tonnes to 103,000 tonnes by 2030 (a reduction of 43%).

Figure 11: The fate of plastics in Viet Nam: business-as-usual versus realistic SCS

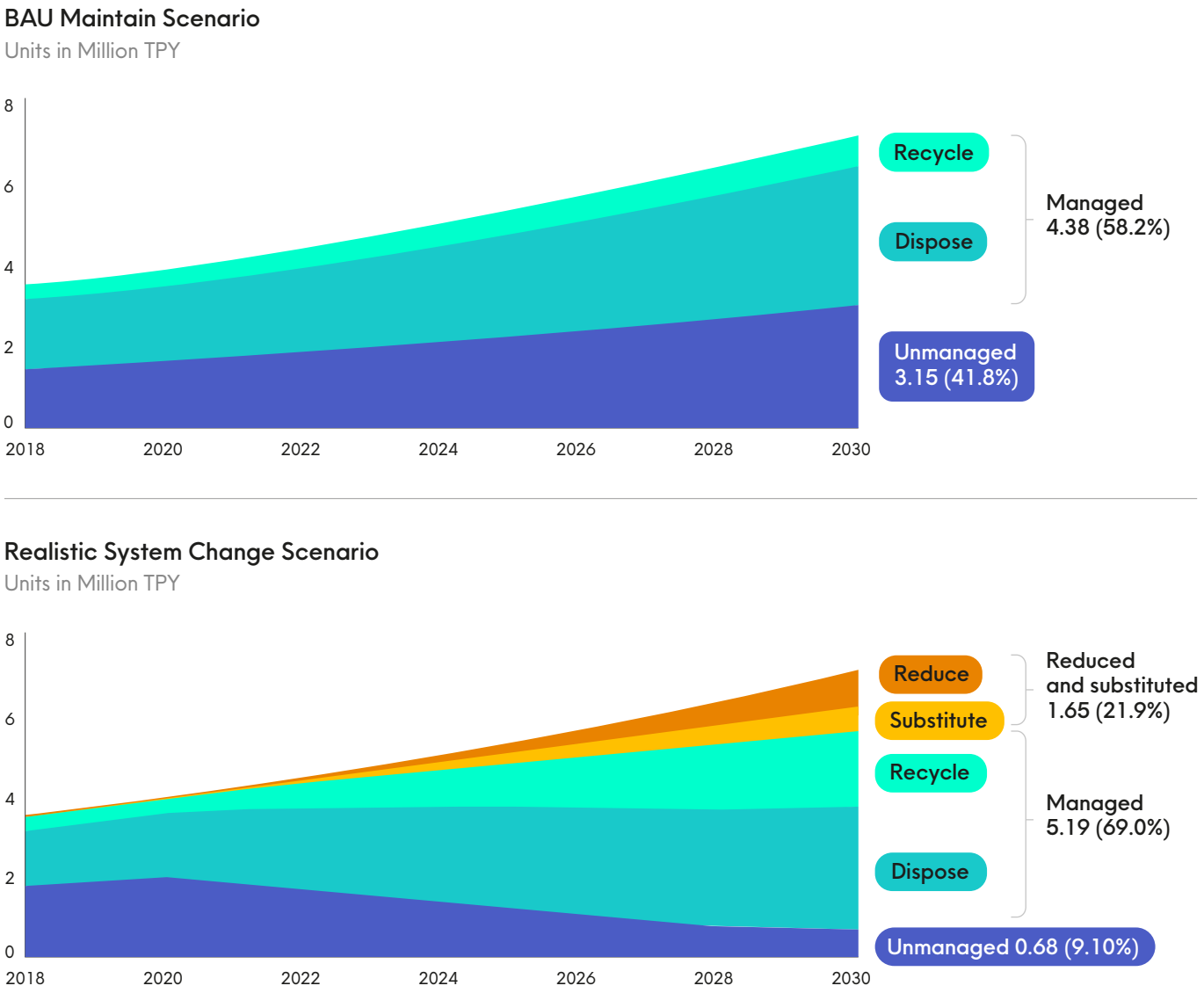
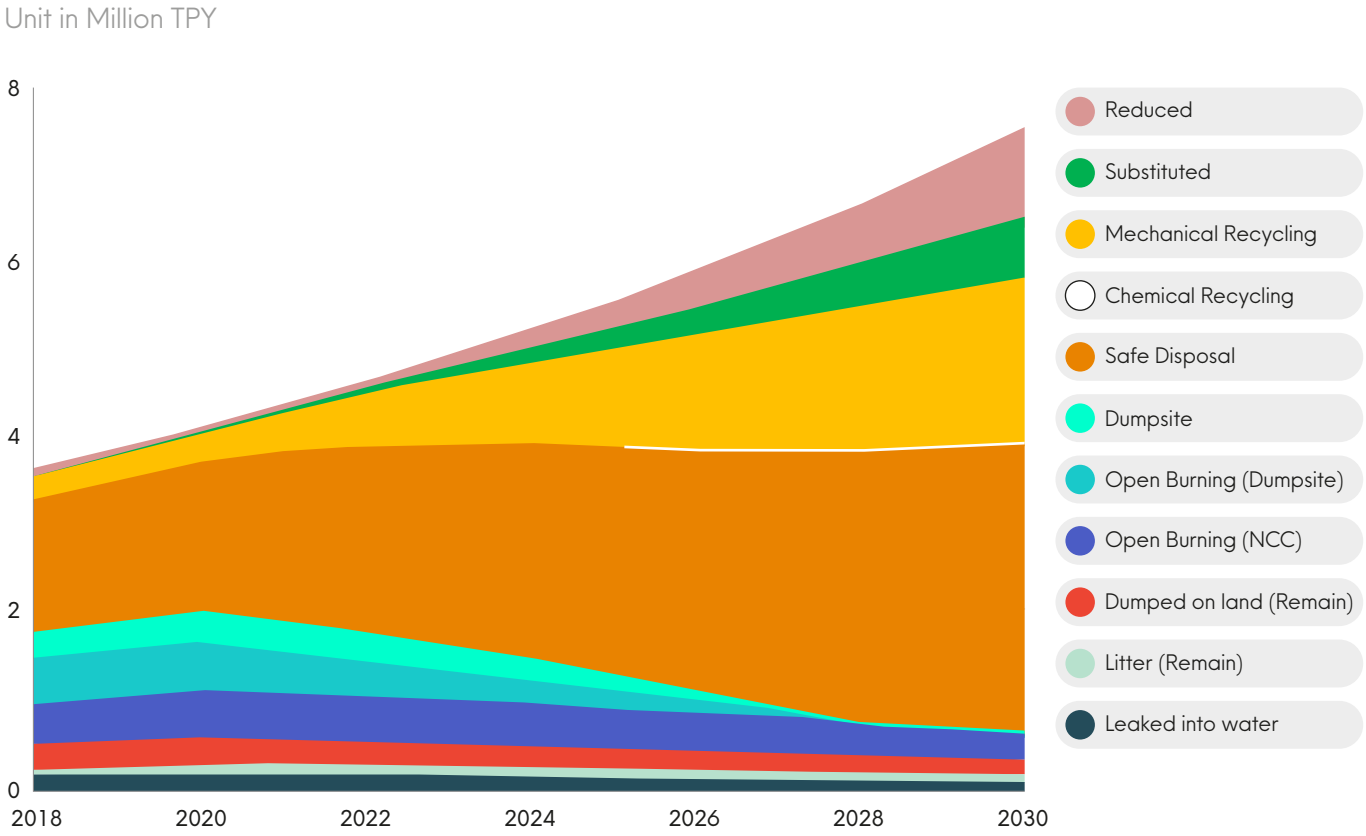


Figure 12: Fate of plastics in Viet Nam under the realistic SCS



The ***realistic*** SCS makes a major contribution to the 2030 Sustainable Development Goals, with benefits felt well beyond the specific target to prevent and significantly reduce plastic leakage into waterways and other marine environments. Benefits are also created in terms of poverty reduction, better health, increased employment, climate change and much more. This report estimates that a total of 151,000 additional jobs will be created under the ***realistic*** SCS relative to the base year of 2018. Additionally, a 56.4% reduction in greenhouse gas emissions can be obtained. The benefits seen under the ***ambitious*** SCS would be even higher.

Please see **appendix E** for further information on the economic, environmental and social benefits.

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3.2 System intervention 1 – Reduction and substitution of plastics

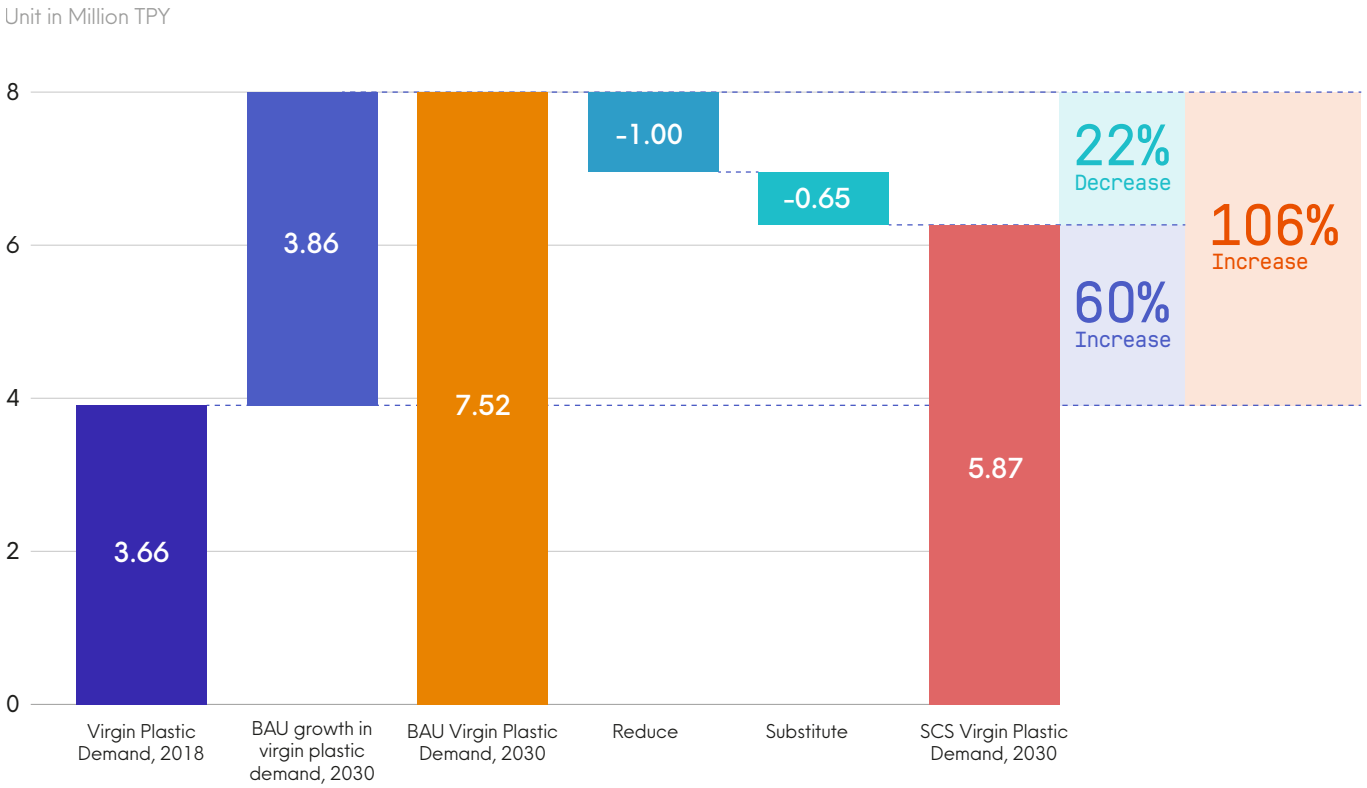
Under business-as-usual, plastic consumption is expected to more than double (a 106% increase) by 2030. This is due to the combined impact of an 82% per capita plastic consumption increase and an 8% population growth. This reality highlights the urgency for plastic waste reduction and substitution.

Under the ***realistic*** SCS, this intervention reduces growth in plastic production and consumption to avoid 13% (~1.0 million tonnes) of projected plastic waste generated by 2030. It also substitutes plastic with paper, coated paper and compostable materials to avoid a further 9% (~0.65 million tonnes) of plastic waste generated by 2030, resulting in a total plastic avoidance of 22%. Under the ***ambitious*** SCS, reduction avoids 26% (~1.93 million tonnes) of projected plastic waste generated by 2030 and substitution avoids 9% (0.68 million tonnes) of plastic waste generated by 2030, resulting in total plastic avoidance of 35%.

Even after successful implementation of reduction and substitution levers in Viet Nam, plastic demand under the ***realistic*** scenario will still increase by 60% compared to the 2018 baseline year, as can be seen below in Figure 14. For the effects of the ***realistic*** and ***ambitious*** SCS beyond 2030 and up to 2040, please see appendix F.

Plastic consumption is expected to more than double (a 106% increase) by 2030.

Figure 13: Virgin plastic demand under business-as-usual and *realistic* SCS



I: Virgin plastic reduction in this visual does not factor increased recycled feedstock usage which would support to reduce virgin consumption further.

3.2.1 Reduction

The key reduction interventions are elimination, reuse and new delivery models, with a focus on six plastic applications: flexible film, multilayer/multimaterial flexibles, packaging, carrier bags, food service disposables and bottles.

By 2030, it's ***realistic*** to reduce plastic consumption in Viet Nam by 13% as compared to BAU and ***ambitious*** to cut it by 26% versus BAU - a reduction of 1.00 and 1.93 million tonnes respectively. The ***ambitious*** SCS is slightly higher than the ***realistic*** SCS because it includes the Viet Nam government's plans to eradicate certain single-use plastic items by 2025.[73]

The reduction achievable by 2030 was determined by analysing three reduction levers: 1) eliminate, 2) reuse, and 3) new delivery models. Further information regarding the methodology used is available in appendix F. Under the ***realistic*** scenario, elimination (such as eradicating unnecessary items and over-packaging) provides a 1% reduction in plastic, expanding reuse options (such as deposit-refund and refill schemes) provides a 4% reduction, and new delivery models (such as refill systems) provide an 8% reduction.

Under the ***realistic*** SCS, six key plastic applications account for approximately 83% of total reduction potential:

- ***Films (flexible monomaterial)*** (30% of total plastic waste generated pre interventions). Products that fall under the non-compostable plastic bag ban under the Law of Environment Protections will be phased out by 2030. Elimination interventions for other films (particularly food packaging and medical applications) will require further studies, taking into account food safety, hygiene, product lifecycle, and affordability, to lessen the impact on the environment and consumers.

- ***Multilayer/multimaterial flexibles*** (18% of total plastic waste generated pre-intervention) are usually used for single-use, small format applications, such as shampoo sachets or snack packaging. In the case of sachets, new delivery models, such as dispense and refill stations that enable consumers to refill products with their own containers, can reduce their usage.

- ***Business-to-business packaging,*** both rigid monomaterial and flexible monomaterial, (9% of total plastic waste generated pre-intervention) is usually for large applications. Flexible packaging can be reduced by establishing deposit return systems that encourage packaging reuse.

- ***Carrier bags*** (8% of total plastic waste generated pre-intervention). Carrier bags have a high potential for reduction through greater reuse. Consumers can be encouraged to bring reusable bags when shopping with charges levied by retailers for providing carrier bags.

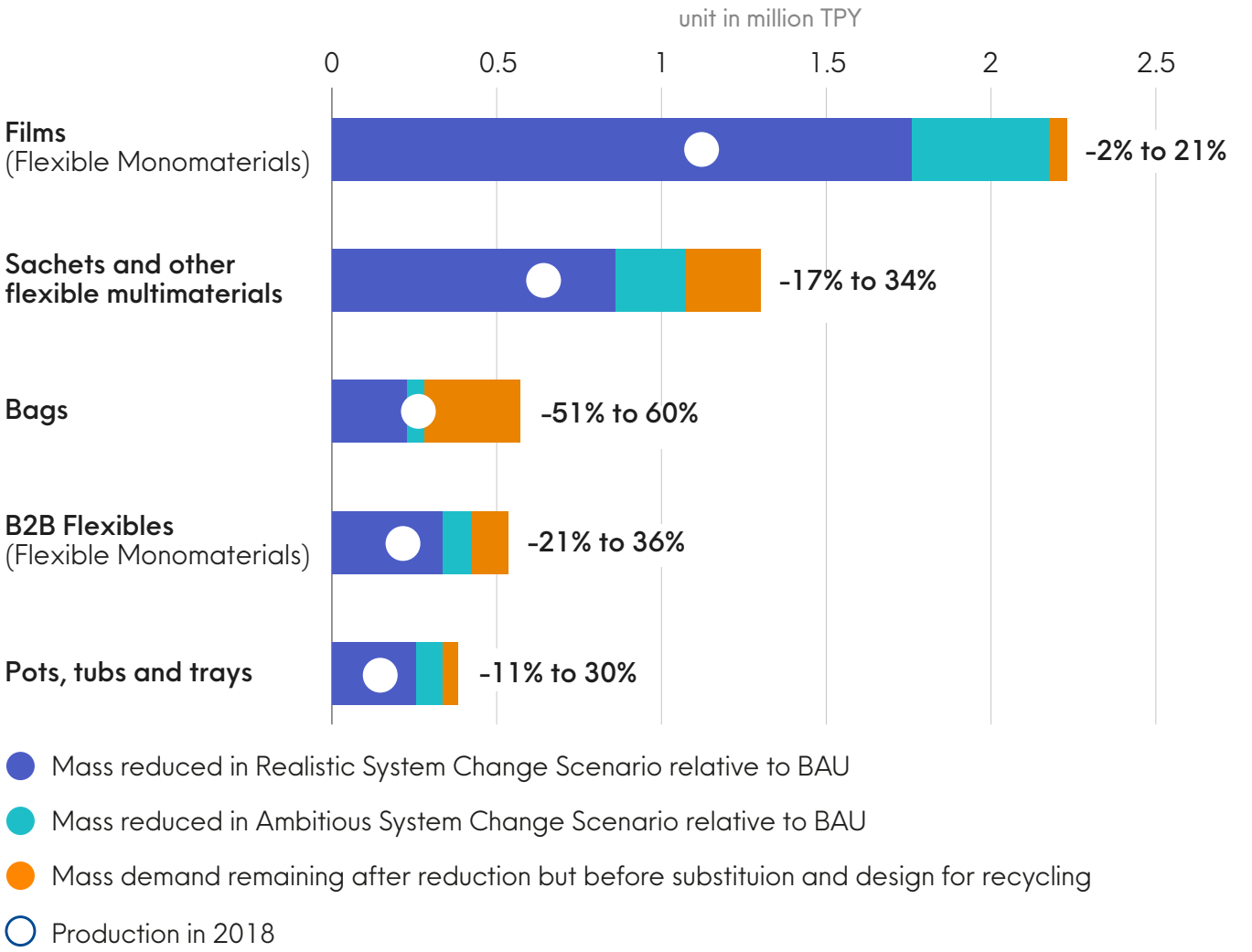
- ***Food service disposables*** (3% of total plastic waste generated pre-intervention). Food service disposables, particularly small format items such as straws and stirrers, can be eliminated via bans. Other food service disposables can be reduced through new delivery models. For example, for take-away drinks, retailers can adopt a return system where reusable take-away bowls and cups can be returned to any participating outlet.[74]

- ***Bottles*** (1% of total plastic waste generated pre-intervention), specifically water bottles, can be reduced through both reuse and new delivery method models. Consumers can be encouraged to use reusable bottles and stores can charge a fee that's lower than the cost of a new bottle of water to refill consumers' bottles.

26%

By 2030, it's realistic to reduce plastic consumption in Viet Nam by 13% as compared to BAU and ambitious to cut it by 26% versus BAU - a reduction of 1.00 and 1.93 million tonnes respectively.

Figure 14: Annual mass of plastics reduced compared with business-as-usual, and remaining material demand after the application of reduction interventions - for both *ambitious* and *realistic* scenarios



A reduction of plastic production — through elimination, the expansion of consumer reuse options, or new delivery models — is the most attractive solution from environmental, economic, and social perspectives. It offers the biggest reduction in plastic pollution, often represents a net saving, and provides the highest mitigation opportunity in GHG emissions

Breaking the Plastic Wave

Please see **appendix F** for a summary of differences in reduction between the ***realistic*** scenario and the ***ambitious scenario.***

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3.2.2 Substitution

The six targeted plastics (flexible films, sachets and multilayer films, rigid monomaterial packaging, carrier bags, pots, tubs and trays and food service disposables) can be successfully substituted using paper, coated paper or compostable materials.

The degree of plastic substitution achievable by 2030 was determined by analysing three specific alternatives: 1) paper, 2) coated paper with a maximum of 5% plastic coating (by weight, a volume which is acceptable to recyclers), and 3) certified and appropriate compostable materials (including compostable plastic and non-plastic materials).

In the **realistic** SCS, 0.65 million tonnes of plastic consumption can be avoided via substitution with paper (0.7% of business-as-usual consumption), coated paper (0.4%) and compostable materials (7.9%) in 2030. Under the more **ambitious** SCS, 0.68 million tonnes can be substituted. This can be achieved without significantly affecting the performance, affordability or social and environmental acceptability of packaging and single-use items. For further information regarding the methodology and the reasons for the selection of these three materials as suitable substitutes, please see appendix F. As a next step, a detailed life cycle assessment (LCA) of the environmental impacts of the substitution materials against that of their plastic counterparts in Viet Nam will be needed.

Under the ***realistic*** SCS, six plastic applications account for approximately 98% of total substitution potential. They are as follows:

- **Flexible monomaterials** (30% of total plastic waste generated pre interventions). Problematic and unnecessary flexible films products, such as plastic bags, can be replaced with compostable and environmentally friendly alternatives. Substitution interventions for other films (particularly food packaging and medical applications) will require further studies, taking into account food safety, hygiene, product lifecycle, and affordability, to lessen the impact on the environment and consumers.

- **Sachets and multilayer films** (18% of total plastic waste generated pre-intervention). Compostable alternatives for food-grade sachets are already available on the global market, mainly in Europe.[75]

- **Other rigid monomaterial packaging** (9% of total plastic waste generated pre-intervention) includes products such as plastic egg boxes. Switch from plastic egg boxes to compressed recycled pulp-based boxes and compostable alternatives.

- **Carrier bags** (8% of total plastic waste generated pre-intervention). Paper alternatives to plastic bags already exist and can be further adopted to eliminate single-use plastic bags. Compostable alternatives also already exist in Viet Nam and are gaining ground in supermarket chains.[76]

- **Pots, tubs and trays** (5% of total plastic waste generated pre-intervention) includes, but is not limited to, tubs for ice-cream and yoghurt and instant snack pots. Paper and coated paper alternatives already exist for some popular international ice-cream brands. Such technology can be adopted for the remaining market input goods.[77]

- **Food service disposables** (3% of total plastic waste generated pre-intervention). Plastic food service disposables, such as cutlery and plates, can be replaced with paper or industry-grade compostable alternatives.[78]

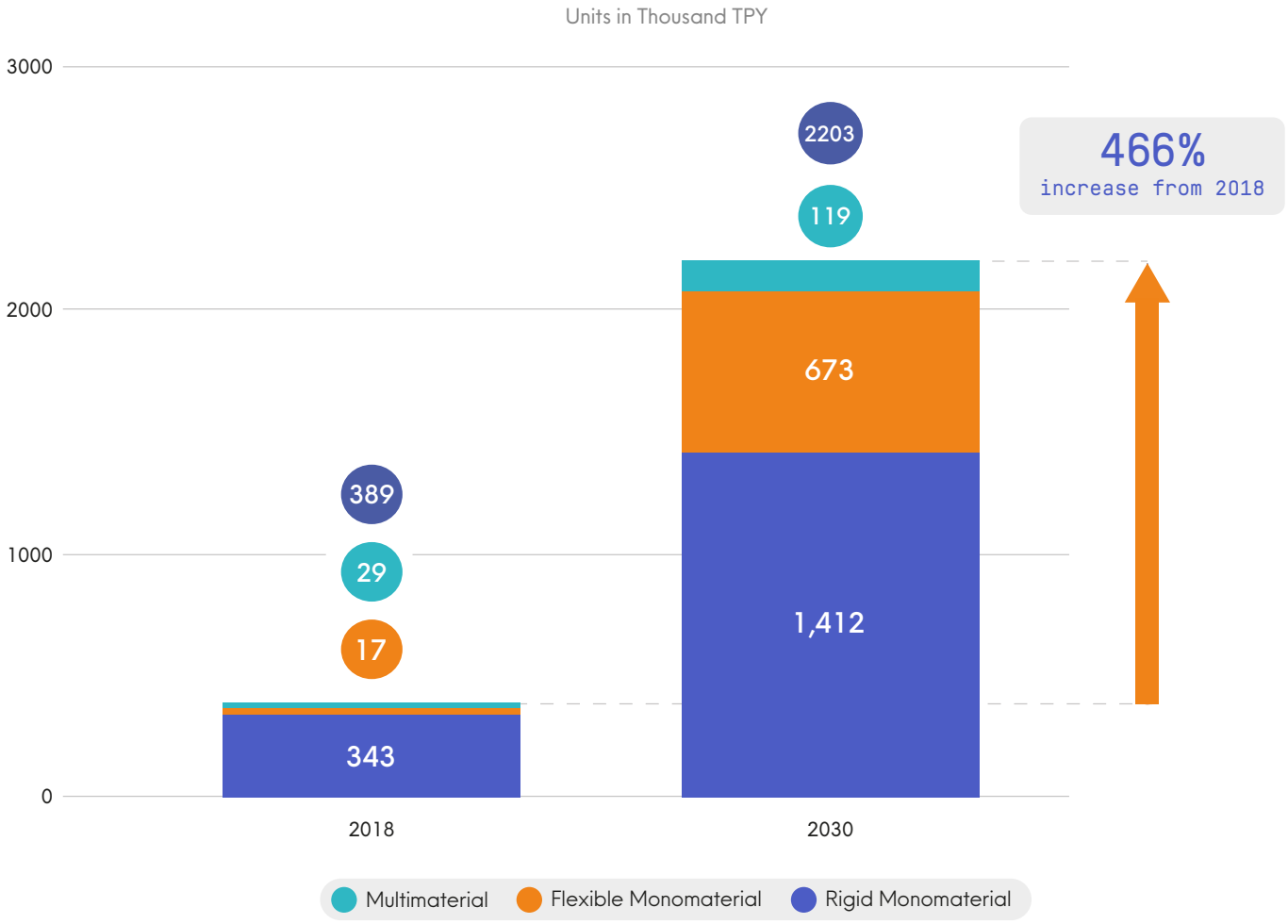
Figure 15: Amount of plastic generated in 2030 for the six key product applications post-reduction and -substitution under the *realistic* SCS, as compared to BAU.

3.3 System intervention 2 – Significantly expand economically viable recycling

This intervention includes designing products and packaging for recycling to expand the market share of mechanically recyclable plastic (rigid and flexible monomaterials) from 76% in 2018 to 85% in 2030. It also includes implementing policies which address systemic market failures in the recycling system and create an economically viable recycling system which can be expanded. Additionally, the intervention calls for the building of additional recycling capacity in line with the necessary increases in collection for recycling.

By implementing price incentives or similar EPR tools that increase the value of post-consumer plastics and the demand for recycled plastic products, building capacity for the informal economy, expanding the recycling industry, introducing new end-of-life technologies, designing for recycling and increasing formal source segregation, it is estimated that the amount of plastic collected for recycling in Viet Nam can increase from 11% in 2018 to 38% in 2030. This is equivalent in tonnage to an increase from approximately 0.39 million tonnes in 2018 to 2.20 million tonnes in 2030 - a 466% increase. Achieving these aims will divert plastic away from potential leakage and reduce GHG emissions.

Figure 16: Amount of plastic collected for recycling in 2018 and 2030 under the *realistic* SCS



3.3.1 Design products and packaging for high-value recycling

The proportion of mechanically recyclable plastic (rigid and flexible monomaterials) would increase by 9 percentage points (from 76% in 2018 to 85% in 2030) under the realistic SCS through design-for-recycling interventions that focus on multimaterial flexibles, multimaterial rigid household goods, removing harmful components, tackling problematic polymers and altering packaging formats.

As shown in Figure 9, Chapter 2, flexible and multimaterial plastics currently make up an estimated 67% of in-scope plastic consumption in Viet Nam but are estimated to be responsible for 82% of plastic leakage in 2018. This is because the informal recycling sector targets plastics with the highest market value, leaving most of the low-value materials to go uncollected or be later disposed of or unmanaged.

Globally, only 21% of today's plastic is economically recyclable. In Viet Nam, research suggests that 11% of plastic is collected for recycling. Design for recycling can increase recycling rates worldwide by raising the market share of recyclable plastics and improving the yield and value of recycled plastic, thereby improving the profitability of mechanical recycling. It's estimated that, around the world, design-for-recycling interventions can improve the economics of recycled plastic by $120 per tonne - almost doubling recycling profitability.[79]

The design for recycling levers for Viet Nam is:

1. **Switch 50% of multimaterial flexibles, particularly sachets and multilayer packaging, to monomaterial flexibles by 2030.**[80] Multimaterial products are particularly difficult to recycle and can only undergo open-loop mechanical recycling which produces lower-value products than closed-loop mechanical recycling. Innovations in the industry indicate, however, that monomaterial alternatives will be able to meet the required barrier properties to replace multimaterial flexibles as early as 2030.[81]

2. **Switch 5% of multimaterial rigid household goods to rigid monomaterials by 2030.**[82] Using monomaterials to replace multimaterial household goods has less foreseeable potential than using them to replace multimaterial flexibles due to the unique performance properties required for household goods.

3. **Redesign (or remove) dyes, plastic pigments, toxic additives and glues.** These changes are a key intervention for improving the economics of **rigid plastic recycling,** in particular. It's recommended that coloured plastics, glues for labels, fragrances and other toxic additives should not be used in plastic products and packaging as they raise the sorting and processing costs, increase contamination loss rate and reduce the output value for recyclers.

4. **Moderate the use of calcium carbonate and other fillers.** Usage of certain fillers, such as calcium carbonate (CaCO3), wood and others could cut costs and reduce greenhouse gas emission. However, unsuitable fillers affect the density of flakes, making these materials difficult to separate mechanically and sharply increasing the contamination loss from 2 to 5% to 20 to 30%[83,84]. Thus, fillers should be used in moderation so that they don't affect the recycling process. Unsuitable fillers, such as wood shavings, should be banned and policed by the plastics industry.

5. **Redesign packaging formats and eliminate problematic polymers.** Some packaging formats, such as sachets, present such problems to collection and recycling that they should either be fundamentally redesigned or eradicated completely through reduction and substitution levers. Sorting and recycling of plastic can be improved by eliminating hard-to-recycle polymers, such as PVC, PS and EPS, that would otherwise contaminate the rest of the plastic waste stream and reducing the number of polymers used overall.

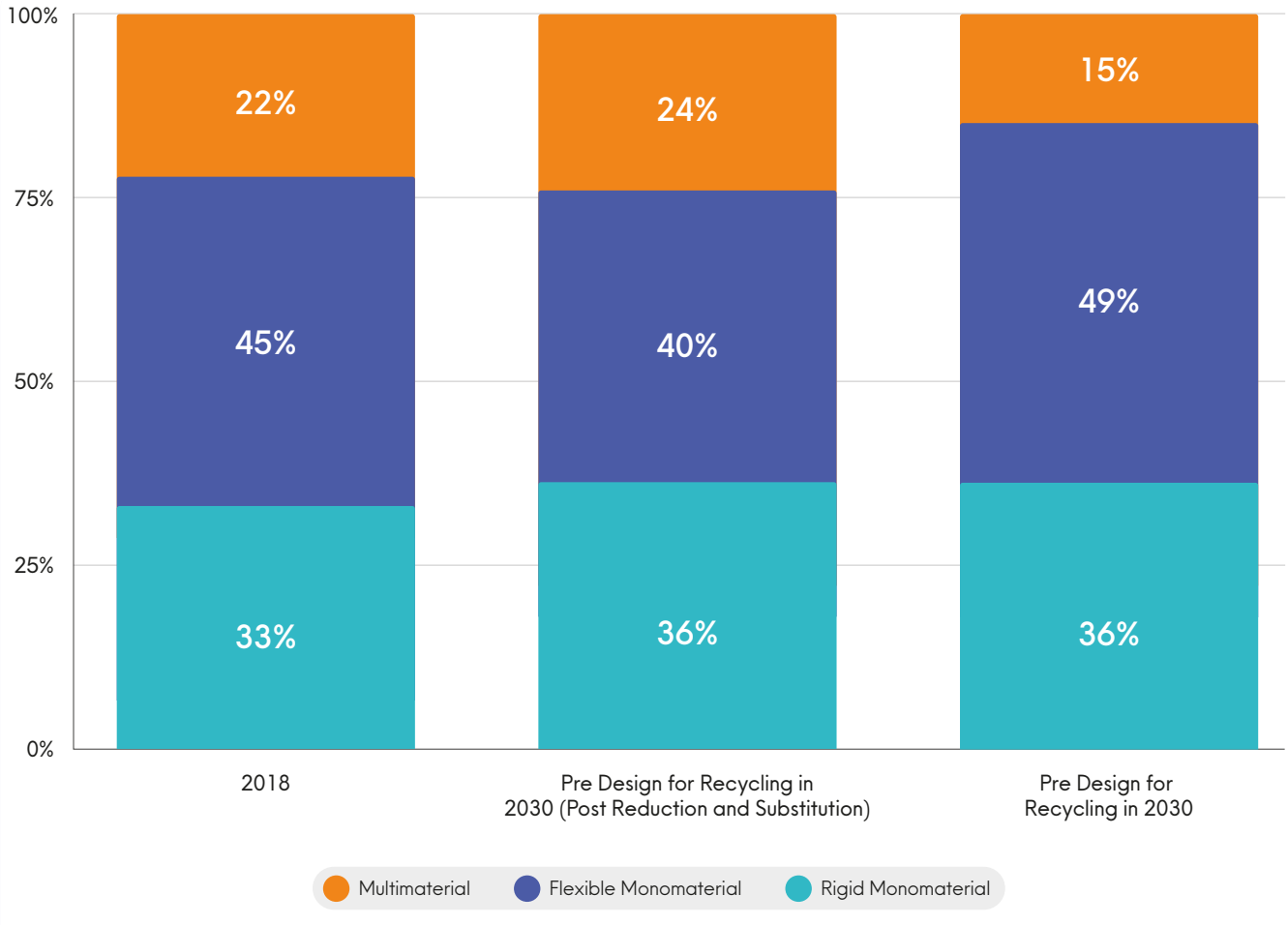
6. **Improve labelling.** Labels can help sorters put products in the correct stream for recycling. To enhance sorting efficiency, producers should adhere to clear international or national standards which have labelling for recycling in mind.

7. **Involve women, youth and informal economy.** These groups must be involved in the design process to ensure new product and packaging innovations meet their unique needs as consumers and resources collectors. Redesign efforts should identify and capitalize on existing consumer preferences and assess the effects of new business models on the livelihoods of women and informal economy workers.

The above design improvements to packaging material within Viet Nam are a critical part of making Vietnamese post-consumer plastics as attractive to recyclers as imported feedstock. If design issues persist with local feedstock, recyclers will continue to prefer better quality imported feedstock.

By 2030, under the ***realistic*** SCS, the design-for-recycling intervention expands the share of mechanically recyclable plastic (rigid and flexible monomaterials) by 9 percentage points (from 76% to 85%).

Figure 17: Design for recycling increases mechanically recyclable plastics by 9 percentage points from 2018 to 2030



3.3.2 Address market failures in order to boost the recycling system

There are several key challenges for the recycling industry, including: volatility of oil, virgin plastic and recycled plastics prices; lower quality of recycled plastics; subsidies for virgin plastic production and low plastic disposal costs.

Although society cannot recycle itself out of the plastic pollution problem, recycling is a critical part of the SCS, as recycling diverts plastics away from leakage and reduces GHG emissions. Under the ***realistic*** SCS, this sub-intervention, applied alongside design for recycling, increases the MSW plastic collected for recycling from 11% to 38% in 2030 (an increase from approximately 0.39 million tonnes to 2.20 million tonnes).

There are several, linked reasons why recycling has struggled to predominate, but the main reason is its fragile economics. Increasing the recycling rate of plastics requires a sustainable and profitable recycling industry. Achieving that requires a fundamental change to the economics of recycling so that recycled plastics are as or more competitively priced than virgin plastic. Removing the economic challenges and bottlenecks that the recycling industry faces will increase the capacity and output of the recycling industry, making it more attractive to investors and funding.

The key economic challenges that limit the growth of the plastics recycling industry are as follows:

- **Price volatility affects the viability of the recycling sector.** Volatility of oil and virgin plastic prices applies downward pressure to recycled plastic prices. Oil price drops make virgin plastics cheaper and hinder recycled plastics competitiveness. Industry sources suggest that recyclers generally need the price of oil to be above $70 to 80 per barrel to compete against virgin plastic. Between January 2015 and September 2020, the price exceeded $70 a barrel just 4% of the time,[85] leading many recycling businesses to struggle to break even. However, the situation has since stabilized with the oil price consistently not less than $70[86] between June 2021 to March 2022. See box 2 for the impacts on recycling from the COVID-19 induced economic downturn.

- **Price volatility reduces collection rates and hampers sustainable collection growth.** The volatility in recycled prices ripples through the value chain. When post-consumer plastics drop in value, the informal economy places greater emphasis on collecting higher value materials, such as metals and papers. Price volatility is constant, so collected-for-recycling rates for plastic haven't increased consistently. Instead, they tend to level out at about the same average.

- **Quality of recycled output.** Historically, recycled plastics haven't consistently matched the grade of virgin plastics. That means recycled plastics are generally sold at a discount compared to virgin material. In South-East Asia and Viet Nam, recyclers report that, in order to compete, they generally need to sell their post-consumer recycled material at between 10 and 50% less than virgin prices.[87] This limit on the profitability and value that recycling can create restricts its potential for expansion.

- **Significant support for virgin plastic production and minimal support for plastic recycling.** Whether it be in the form of fossil fuel subsidies or petrochemical investment subsidies, virgin-plastic producers benefit from financial support. This uneven playing field disincentivizes recycling, as does the lack of a legal requirement to include recycled contents in plastic packaging.

- **Low disposal costs.** Landfill and incineration options have historically been inexpensive, stifling the desire to focus on alternatives, such as recycling. With no cost-avoidance pressures, such as landfill costs or tipping fees, municipalities aren't incentivized to support the diversion of plastics and other materials towards recycling.

All these factors have resulted in bankruptcies and the closure of many recyclers during particularly challenging periods, such as the 2008 financial crisis and the 2020 COVID-19 pandemic. They've also discouraged investment in new recycling businesses. Many believe this has led to a stagnant or even falling global recycling rate.

Despite so many discussions, the plastic recycling rate globally is going down

Mr. Surendra Patawari, Gemini Corporation, partner of the Global Plastic Action Plan (GPAP)[88]

Box 3: The COVID-19 pandemic, combined with historically low crude oil prices, exacerbated challenges for the plastics recycling value chain in Viet Nam and the South-East Asia region

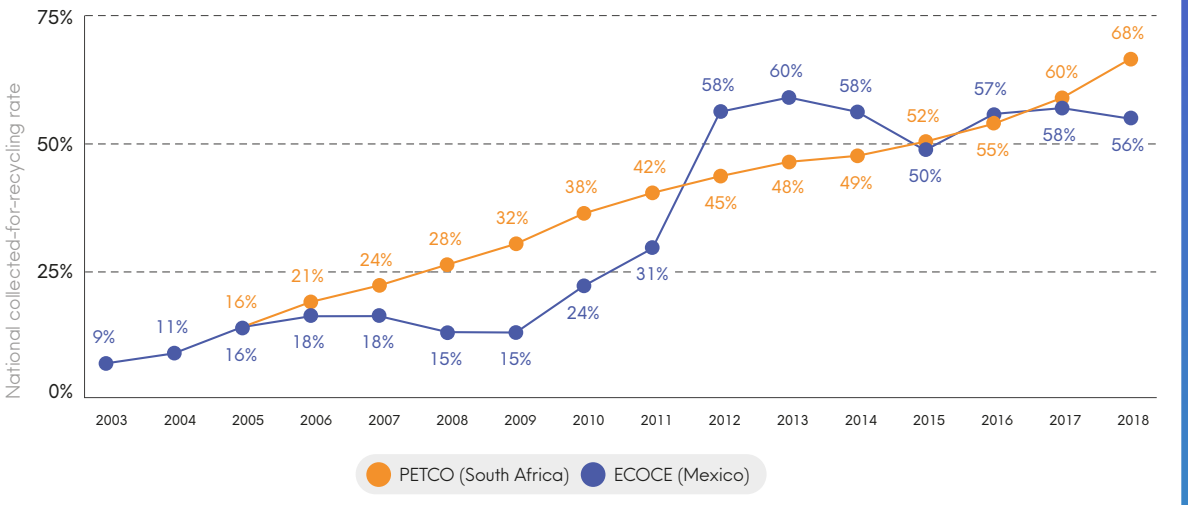
- The COVID-19 pandemic caused many serious setbacks for the ongoing global movement to tackle plastic waste. In July 2020, the recycling value chain in South-East Asia was in a critical position. Since the pandemic began, recyclers across five countries (Viet Nam, Indonesia, Thailand, the Philippines and India) saw, on average, a 50% drop in demand for their products and a 21% drop in sales prices. Due to this and other COVID-related challenges, it's estimated that between 40% and 60% of recyclers and plastics recycling businesses were in a grave financial position and at risk of insolvency or closure.[89]
- In addition, the low oil prices between January 2015 and September 2020 made recycled plastics less competitive with virgin plastics and thus caused a big constraint to plastic recycling. Since June 2021, the situation has improved in terms of both the COVID-19 pandemic response and a stabilization of oil prices. However, the global economic growth is forecasted to decrease to 3.2% in 2022 (from the previous World Bank estimate of 4.1%) due to the war in Ukraine, inflation, and the lingering effects of the pandemic[90], leading to continued challenges for the recovery of plastic recycling.

The bottlenecks faced by the plastics recycling industry stem from the supply chain of post-consumer plastics which, in Viet Nam, is almost entirely reliant on the informal economy. It's vital to recognize the critical role that the informal economy plays in any effort to scale up the plastics collection and recycling industry. It's estimated that the informal economy in Viet Nam collected 323,000 tonnes of MSW plastic for recycling in 2018 (83% of the total plastics collected-for-recycling). Without the informal economy's work, much of this plastic waste would otherwise have leaked into waterways.

Plastic collected for recycling in Viet Nam can increase from 11% in 2018 to 38% in 2030 if a series of solutions are implemented, including: EPR schemes such as price incentives or advanced fees; recycled content targets or similar actions that increase the value of post-consumer plastics; building capacity and giving decision-making power to the informal economy; expanding the recycling industry and introducing new end-of-life technologies; and segregation-at-source and design-for-recycling efforts. This increase would be equivalent to moving from an estimated 0.39 million tonnes collected in 2018 to 2.20 million tonnes collected in 2030; a 466% increase. Case studies of South Africa and Mexico (Box 4) illustrate why EPR approaches are essential to address the current market failures of plastic recycling and boost recycling rates.

It's estimated that the informal economy in Viet Nam collected 323,000 tonnes of MSW plastic for recycling in 2018.

Box 4: South Africa and Mexico offer good-practice examples of how to address market failures and boost the recycling system



Note: Rates rounded to nearest %.

Over the past 15 or more years, voluntary packaging recovery organizations (PROs) in South Africa (PETCO) and in Mexico (ECOCE) have increased the rate at which PET bottles are collected for recycling from 16% to 68% and from 9% to 56% respectively. The independent, non-profit PROs were set up by obliged industries (brand owners, bottlers, converters, etc) in both countries to address the low PET collection and recycling rates. While both PROs focused primarily on PET, the core principles are applicable to all plastics and packaging.

The key to success of the PROs has been their use of **price incentives to drive up recycling rates through greater collection.** In South Africa, the total price incentive and administrative cost of recycled post-consumer PET bottles has been between $0.05 and $0.14 per kg. This amount has fluctuated depending on global factors, such as the price of competing commodities, and macro economic situations, such as the financial crisis in2008. There are times when recycling is unprofitable, and recyclers are pressured to drop their raw material prices to the point where informal economy collectors and aggregators disincentivize the collection of post-consumer PET bottles. The price incentive is paid via recyclers with a variety of support mechanisms (based on PETCO's recycling targets) to encourage collectors and aggregators to grow their market with market-driven rates for collected materials.

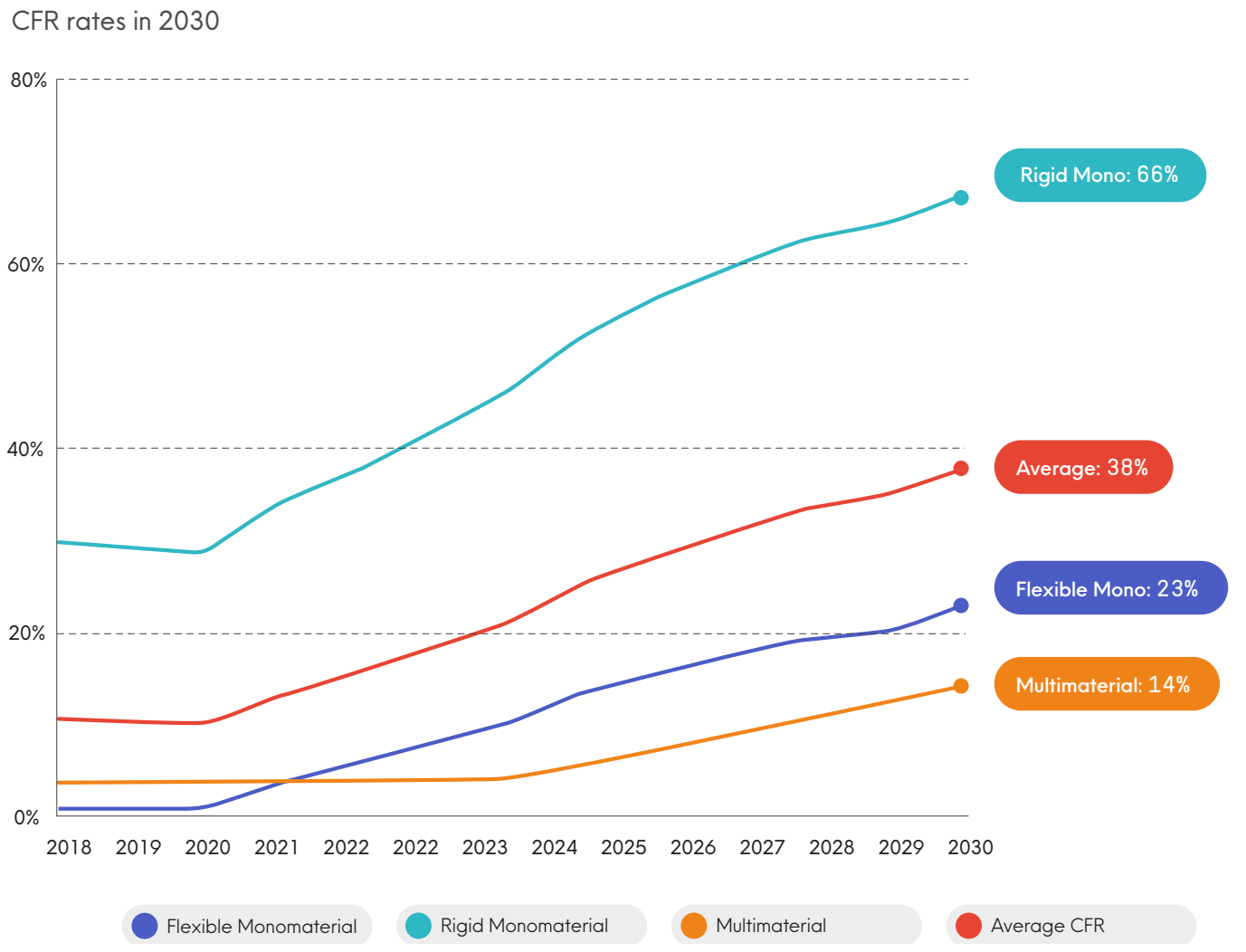
While adding to recycling capacity has been important in both markets, **the price incentive has been the critical factor in the continued increase of collected-for-recycling rates.** PETCO, which has persisted with the price incentive and has consistently increased the PET bottle collected-for-recycling rate to 68% in 2018. Meanwhile, in Mexico, which phased out the price incentive from 2011, growth in the collected-for-recycling rate has stalled at between 50 to 60%. Based on interviews with stakeholders in Mexico, a price incentive may be reintroduced in certain geographic areas with low collection for recycling rates.

These two case studies present just one EPR approach that can increase the post-consumer value of plastic. Other EPR tools include bottle deposit systems, recycled content targets, advanced fees and recycling targets. Please see *Full Circle – Accelerating the Circular Economy for PET bottles in Southeast Asia,* by GA Circular', Plastics Policy Playbook by Ocean Conservancy or similar reports for a detailed analysis of EPR and policy tools, including their advantages, challenges and considerations for successful implementation.

Of the three plastic categories in Viet Nam, each is projected to have different collected-for-recycling rates to 2030 due to their inherent value and various challenges (Figure 18):

- Collection-for-recycling rates of **rigid monomaterial plastics** is projected to increase from 28% to 66%. This is equivalent to approximately 1,070,000 additional tonnes of plastic collected in 2030 as compared to 2018. This increase by 38 percentage points is benchmarked to the 33 percentage points increase achieved by South Africa in 10 years. The remaining 5% can be obtained through improvements in formal source segregation.
- Collection-for-recycling rates of **flexible monomaterial plastics** is projected to increase from 1% to 23%. This is equivalent to an extra 655,866 tonnes of plastic collected in 2030 as compared to 2018.
- Collection-for-recycling rates of **multimaterial plastics** is projected to increase from 4% to 14%. This is equivalent to approximately an extra 89,000 tonnes of plastic collected in 2030 as compared to 2018.

Figure 18: Projected rates of plastic collected for recycling for the three plastic categories (*realistic* SCS)



Once the market failures are addressed by creating the enabling conditions highlighted above, investment to increase recycling capacity will follow because the industry is more attractive industry to investors. There are two types of recycling for which capacity increases are needed: mechanical recycling and chemical conversion (plastic-to-fuel). An additional 1.79 million tonnes of capacity is required for mechanical recycling with an extra 25,000 tonnes needed for plastic-to-fuel recycling.

Please see **appendix G** for further information.

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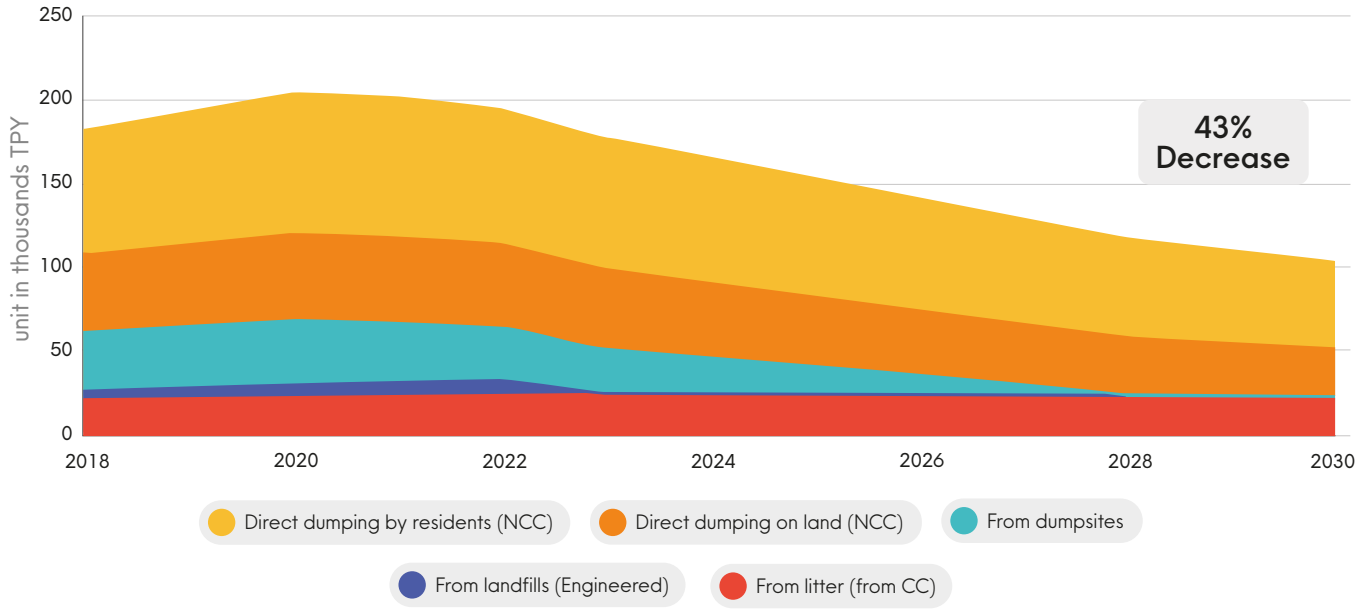
3.4 System intervention 3 – Expansion of MSW collection coverage, safe disposal and littering prevention

Three specific interventions are needed to stop or limit plastic waste leakage from the waste management process: 1) comprehensive MSW collection coverage; 2) controlled disposal; and 3) litter prevention and removal. All three levers must be activated simultaneously to produce a demonstrable change. For instance, even if collection coverage was increased to 100%, on its own, it would have little impact if leakage still occurred downstream at disposal facilities.

Within this intervention, the most significant drop in plastic leakage (41,000 tonnes) comes from improving and expanding safe disposal facilities. This involves phasing out dumpsites (moving to engineered landfills only) by 2028 and stopping leakage from engineered landfills by 2023. Expanding collection coverage is almost as impactful, reducing plastic leakage by nearly 40,000 tonnes. Behaviour change efforts focused on reducing littering will further drive down the amount of plastic waste leaking into waterways. It's worth noting that, according to circular economy principles, disposal is the last resort. However, in Viet Nam, where recycling capacity is still limited, safe disposal is an essential short- to medium-term solution.

Figure 19 below shows the compounding effect of all the interventions (expansion of engineered landfills and phasing out of dumpsites, increase in waste collection coverage and reduction of littering in addition to previously highlighted interventions of reduction and substitution, and significantly expanding economically viable recycling) on the sources of plastic leakage.

Figure 19: Summary of reductions in the sources of plastic leakage into waterways under *realistic* SCS



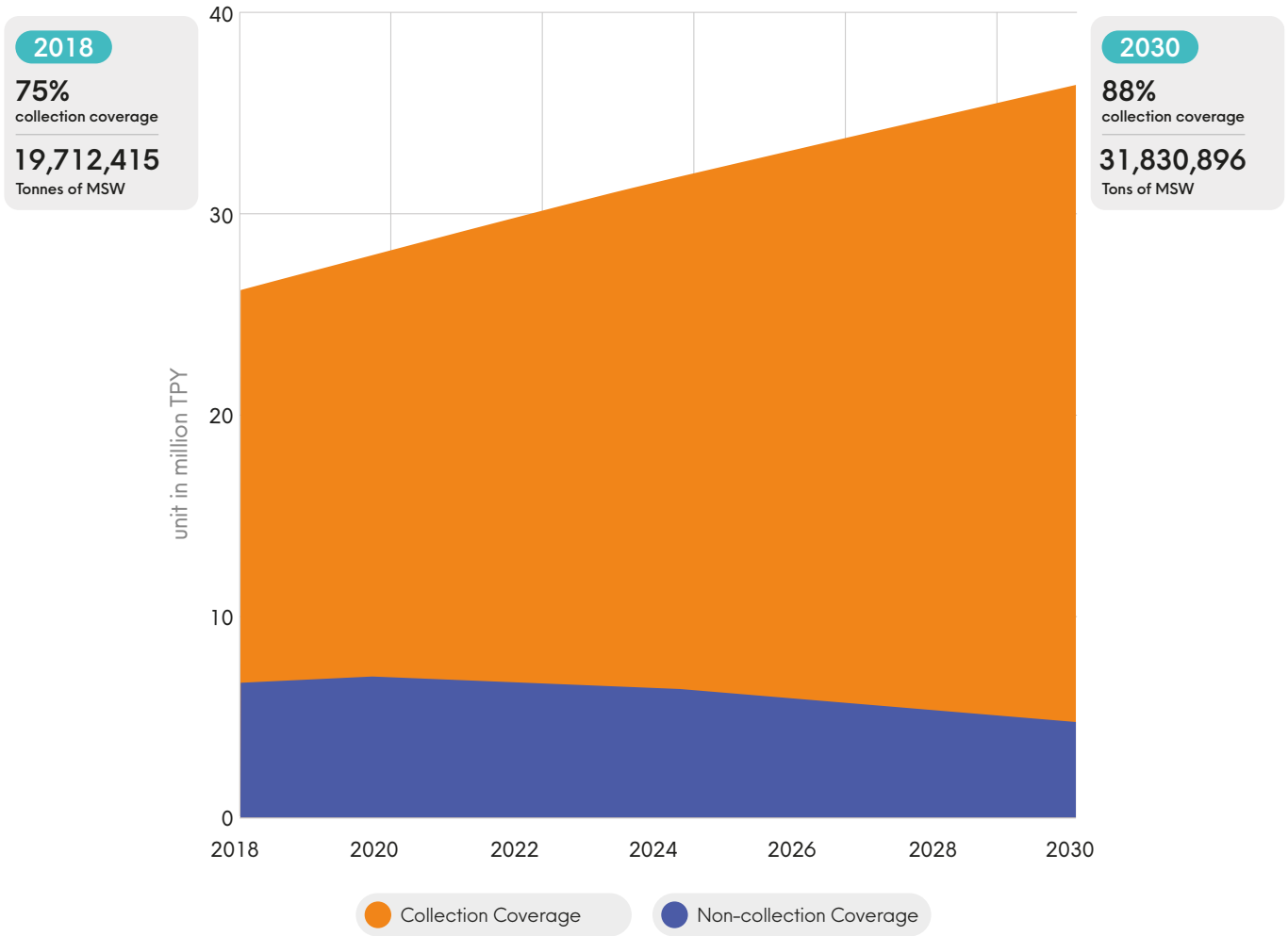
Leakage into waterways due to littering reduces from 5% to 3% in collection coverage areas, but due to increased collection coverage, the total tonnage remains level. In non-collection coverage areas, littering is accounted for by way of direct dumping and dumping on land, which reduce significantly due to improved collection coverage.

3.4.1 Expand comprehensive MSW collection coverage

Expanding the MSW collection coverage is the most important measure to reduce plastic leakage, especially in remote and rural provinces. The *realistic* SCS would increase national MSW collection coverage from 75% in 2018 to 88% in 2030, which could reduce direct plastic dumping into waterways by 31%. The collection service quality and frequency, however, remain key challenges for this intervention.

Under the ***realistic*** scenario, this intervention increases MSW collection coverage from 88% in urban areas and 62% in rural areas in 2018 to 95% and 80% respectively by 2030. This is an increase for the national collection coverage from 75% in 2018 to 88% by 2030, which will result in 12.1 million tonnes more MSW collection tonnage in 2030 than 2018 (and 2.8 million tonnes more plastic waste than the 2030 BAU maintain scenario (Fig.20)). In other words, an increase by 13 percentage points in nationwide collection coverage from 2018 to 2030 leads to an increase of 61% in MSW collection tonnage. This significant increase is due to increases in population and waste generation between the time period (0.76 to 0.98 kg/capita/day) (Box 5).

Figure 20: A 61% increase in tonnes of MSW collected is required from 2018 to 2030 in the *realistic* SCS



Given that a disproportionate amount of leakage occurs in rural populations throughout Viet Nam, especially in the rural and remote province archetypes due to their poor waste collection coverage, improving waste collection in these zones is most critical. The collection coverage in the rural province archetype is just 35% (on average, 55% in urban populations and 26% in rural communities within these provinces) and in the remote province archetype it is at 27% (on average, 40% in urban populations and 19% in rural communities within these provinces). However, increasing collection in these areas is difficult and costly. Thus, meeting the targets of 95% urban collection coverage and 80% rural collection coverage in the ***realistic*** scenario by 2030 is both challenging and ambitious.

Meanwhile, under the ***ambitious*** scenario, the MSW collection coverage increases to 100% in urban areas and 90% in rural areas to achieve a national rate of 95%. This is an increase by 20 percentage points in MSW collection coverage, but an increase by 71 percentage point in MSW collection tonnage.

While Viet Nam boasts relatively high collection coverage rates and is expected to achieve the global target for middle income countries by 2030, efficacy and comprehensiveness of collection coverage has not been assessed. Even areas covered by formal waste collection services may experience infrequent, irregular or inadequate waste collection. The result may be direct dumping by households either into waterways or on land which could lead to waste subsequently entering waterways. Such issues are not modelled within the baseline assessment, yet based on interviews with stakeholders, they do occur.[91] Comprehensive waste collection implies an improvement in the quality and frequency of waste collection in high-coverage areas along with establishing waste collection to new areas. The contribution of the informal economy to waste collection and recycling has not been recognized or supported by the government.

Box 5: Increasing proportions of plastic waste

As incomes rise and consumption patterns change, it's reasonable to assume that, as part of increases to the total waste generated, there will be a more than proportional rise in the amount of plastic waste too. Governments must work harder to maintain the current collection rates, expanding investment in infrastructure and logistics to keep up. While solid waste generated is slated to increase by 33%, from 0.76 kg/capita/day to 1.01 kg/capita/day between 2018 and 2030, increasing at an overall rate of 45% (considering population growth), plastic waste generation is anticipated to grow at almost 103%! The system interventions become even more critical when factoring in that the growth of plastics in the composition of municipal solid waste is expected to increase from 14% in 2018 to 20% in 2030.

3.4.2 Expand safe disposal: engineered landfills, compost and incineration

In order to expand safe disposal for plastic waste, the *realistic* SCS recommended phasing out dumpsites, stopping leakage from engineered landfills, expanding composting facilities and installing new waste-to-energy facilities, which will need significant funds, political will and governance.

As of 2018, 69% of landfills (receiving 46% of MSW by weight) were dumpsites. These dumpsites must be phased out by 2028, so that by 2030 all waste is only disposed of at engineered landfills. Additionally, the current leakage from engineered landfills must be stopped. To achieve this, under the ***realistic*** SCS, 83 additional engineered landfills need to be built between 2018 to 2030 to handle 165 million tonnes cumulatively. Many of the NPAP Experts Group members advised that they think it's unrealistic to phase out all dumpsites before 2030 and that it's more realistic to achieve this by 2035. This highlights that the ***realistic*** scenario, though called realistic, is still extremely demanding and will require significant funds, political will and governance.

Other than phasing out dumpsites and stopping leakage from engineered landfills, the ***realistic*** scenario requires the expansion of composting facilities (nine new facilities, each with a capacity of 200,000 tonnes) which also double as sorting centres, and the installation of new waste-to-energy facilities to accommodate an increase of 1.4 million tonnes per year of waste by 2030. However, it's important that the installation and operation of any new incineration facilities meet global environmental standards, so they should be more properly classified as waste-to-energy facilities, producing energy for the plant's operations and for onward sale.

Please see **appendix H** for further information on composting and waste-to-energy facilities.

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69%

As of 2018, 69% of landfills (receiving 46% of MSW by weight) were dumpsites. These dumpsites must be phased out by 2028, so that by 2030 all waste is only disposed of at engineered landfills.

3.4.3 Significantly reduce littering

Littering of plastics could be reduced from 5% to 3% in 2030 in collection coverage areas following the *realistic* SCS. This can be achieved by implementing behaviour change initiatives (consistent enforcement, education and awareness building), conducting large-scale clean-ups and changing cultural mindsets.

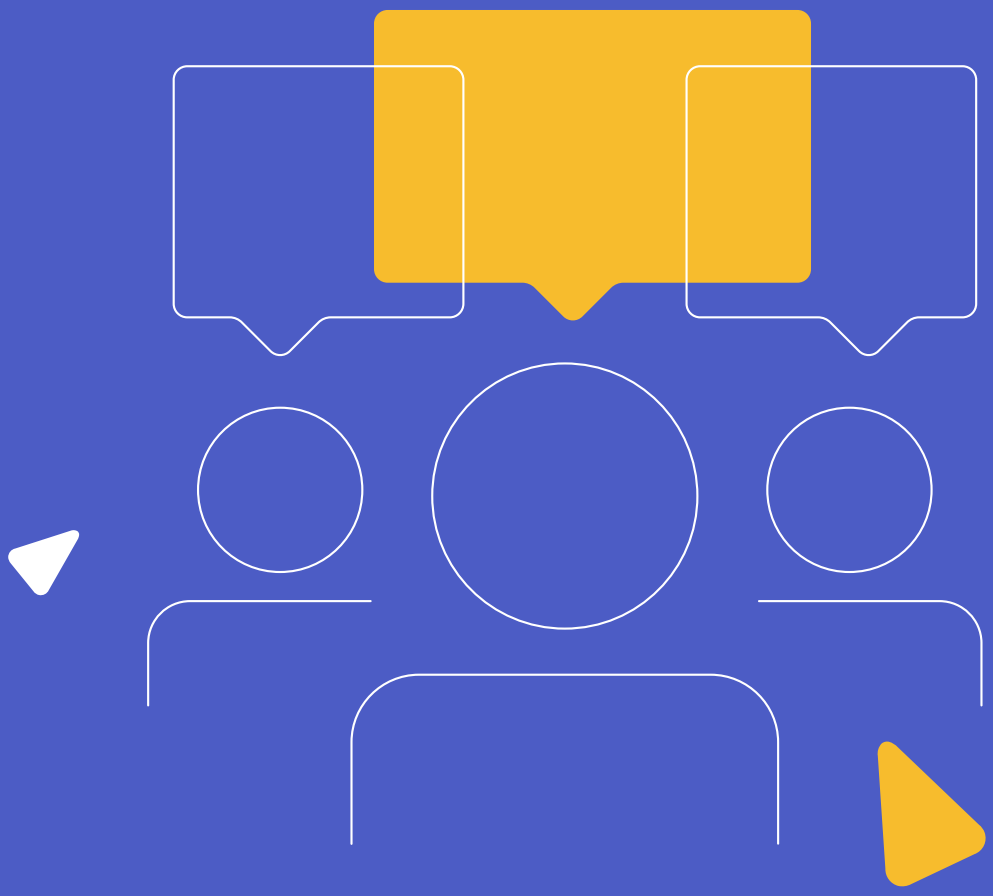
Littering of plastics was estimated at 5% in 2018 in collection coverage areas. Under the ***realistic*** scenario, this can be reduced to 3% in collection coverage areas by 2030. Note that littering behaviours are prompted by different causes, including:

- **Lack of waste collection coverage.** This can cause direct dumping in regions that have no waste collection or in the areas with limited or infrequent waste collection coverage. Behaviour change initiatives must include large-scale clean-ups (including waterway and beach clean-ups) and community action to ensure that entire communities shift away from dumping practices. Note that littering in areas with no waste collection coverage is quantifiably accounted for as direct dumping by residents into waterways and has been discussed in the above sections.

- **On-the-go disposal culture.** With limited bins and waste receptacles in public areas, littering is sometimes the easy option, especially alongside waterways where litter might be washed away. This problem is reinforced by cultural mindsets that view litter as someone else's problem and justify littering because everyone else does it.

Significant behaviour change efforts are required over the long term with consistent enforcement across all socio-economic groups, using a mix of fines, education, awareness building and behavioural nudges. It's crucial that behaviour change campaigns are mainstreamed by national and local media agencies, with consideration given to variances in the geographic causes of littering when designing and communicating relevant messaging.

Behaviour change interventions must also be designed to include diverse demographics and prioritize marginalized communities. Messages aimed at reducing plastic pollution should be appropriately tailored to women as both consumers and household managers. The roles of women and the informal economy must be supported and enhanced as part of efforts to expand source segregation at the community and household levels.



04

Enabling conditions and necessary stakeholder actions

All the presented SCS interventions already exist and their implementation is technically feasible, economically viable and socially acceptable. It isn't a lack of technical solutions that's preventing reductions in plastic leakage, its inadequate regulatory frameworks, poor governance, unhelpful business models, an absence of incentives and deficient funding mechanisms. Achieving a ***realistic*** leakage reduction of 43% will require substantial transformation of waste management, recycling and the plastics industry. The changes must be even more radical to reach the 75% leakage reduction target of the ***ambitious*** scenario. A transition in investment is needed: away from the mature, virgin plastics industries to the nascent, and, at times, riskier provision of new delivery models, substitute materials, recycling facilities, collection, sorting and disposal infrastructure. This shift in investment strategy must commence right away; an immediate concerted effort from all stakeholders (government, industry and enabling institutions) is essential.

The below action plan outlines the enabling conditions for success and the necessary actions for government and the private sector to achieve Viet Nam's leakage reduction ambitions.

4.1 System intervention 1 – Reduction and substitution of plastics

Bans on single-use plastics, new standards for quality and safety of alternative products, materials and solutions, and, especially, an EPR are essential for the reduction and substitution of plastics. Economic instruments, such as incentives and subsidies to support reuse models or alternative materials, as well as funding for innovation, will also be vital to supplement solutions. The active involvement of national government, consumers, the plastics industry and alternative packaging producers are also central to the success of this intervention. Policy interventions should be led by central government and local authorities with support from civil society organizations and industry.

Reduction and substitution can prevent a considerable amount of plastic consumption and, as a result, cut plastic leakage. To do this, many of the policies and incentives that have established the powerful virgin plastic ecosystem must be overhauled in favour of successful adoption of reduction and substitution. The petrochemical and plastics industry must be co-opted into the process so that they can improve manufacture to include recycled content and provide innovative alternatives.

The policies, economic activity and innovation required to create the enabling environment for success are:

- **Regulatory limits.** Policy options and regulations that limit the manufacture of excess and hard-to-recycle packaging and which drive businesses to **reduce** or **substitute** packaging. These policy options should ideally comprise a mixture of taxes, bans and EPR tools. EPR schemes must be gender-responsive and socially inclusive and intentionally support informal economy workers. To incentivize product innovation, eco-modulation principles should be part of any EPR scheme. A ban on single-use plastics (SUP) is strongly supported by the Vietnamese public: in 2019, between 74% and 94% of the population favoured a plastic bag ban.[92] To ensure bans are successfully enforced, awareness and public education campaigns should be aimed at different groups of consumers and producers. SUP and non-degradable plastic bags must not be circulated after 2025 in supermarkets, malls, resorts or hotels, and the production and import of SUP, plastic bags and goods containing microplastics must be halted by 2030[93].
- **Introduction of targets** requiring the reduction or phasing out of certain types of plastics will encourage industry-wide efforts. These could, for example, include targets that impose ceiling on the amount of plastic introduced, increase the volume of reusable materials, and that boost the amount of recycled content in products.
- **Standards that ensure** the quality and safety of alternative products, materials and solutions should be introduced along with standards that ensure plastic waste disposal is as effective as the available infrastructure allows (reverse logistics for reuse models, composting facilities for biodegradable plastics). Certification schemes for sustainable materials and sources of recycled content will promote increased availability of quality alternatives.

Products should be labelled to indicate whether they or their packaging contain microplastics.

- **Policy options, such as economic incentives and subsidies,** that develop the infrastructure to support reuse models or alternative materials (such as composting facilities for biodegradable plastics) also reduce the flow of plastics into the environment. Although taxing non-recyclable plastics risks passing costs onto consumers, it can protect vulnerable and low-income groups too, helping to offset any disproportionate impacts (for example, ringfencing to ensure that tax revenues are used to support waste management or recycling infrastructure). Incentives and financial support can encourage businesses and consumers to substitute more environmentally friendly alternatives and boost the recycling industry.
- **Voluntary commitments by industry players** to accelerate commitments. These commitments also require consumer acceptance to drive demand: reduce usage and eliminate plastics, develop new reuse and delivery models, and expand use of and innovation into viable alternative materials, such as paper and compostable paper packaging.
- **Policy options that help fund innovation** in new materials and reduced packaging design, as well as scaling recovery systems for alternative materials, such as paper, glass and metal, and improving system design for viable reuse models. Consumer acceptance and community action is needed to fuel demand for the reduced packaging and new delivery models.
- **Behaviour change interventions for plastic-use reduction,** such as the development of infrastructure for reuse and refill models, including refillable bottles and automated drinking-water delivery systems in public places. Behaviour change interventions must be developed to include diverse demographics and prioritize marginalized communities. These interventions must be tailored to meet the unique communication needs of women as both consumers and household managers. The roles of women and the informal economy must be enhanced as part of efforts to expand source segregation at the community and household levels.
- **Intersectional gender, inclusivity and diversity mainstreaming and guidance** is necessary for the plastics and consumer goods industries. It must cover all areas of operation, including recruiting targets and approaches to recruitment, human resources policies, flexible working, removal of structural barriers, visible diverse role models and opportunities for career advancement, mentoring and training for women and vulnerable groups involved in the production and consumption of plastics.

The below table summarizes the policy options and necessary actions by key stakeholders.

Table 4: Stakeholder actions needed for reduction and substitution intervention

Sub-interventions	Action	National government	Consumer goods industry	Plastics industry	Alternative packaging manufacturer	Civil society organizations
Reduce plastic usage through levers of elimination, reuse and new delivery models (13% reduction for *realistic* scenario, 26% for ambitious)	**Product bans** on single-use plastics, hard to recycle items	✓✓	✓		✓	
	Taxes or other economic disincentives for low-value single use plastic products without locally and culturally appropriate alternatives	✓✓				
	Policy to discourage importation of plastic products that can't be recycled or processed	✓✓	✓	✓	✓	
	Internal commitments to reduce plastic usage through reuse and new delivery models		✓✓	✓✓		
	Funding and **public procurement** for reuse and delivery models	✓✓	✓			✓
	Gender-targeted behaviour change communication for plastic-use reduction	✓✓	✓	✓	✓	✓
Substitute plastics with suitable alternative materials: paper, coated paper and compostables (9% reduction for both scenarios)	**Subsidies and tax incentives** for compostable and environmentally friendly packaging businesses	✓✓				
	Economic incentives and subsidies that support infrastructure for alternative materials (such as composting facilities for biodegradable plastics)	✓✓			✓	✓
	Internal commitments to transition to alternatives. Building capacity to scale alternative production		✓✓		✓✓	

Note: Key actors are indicated with two ticks ✓✓ while supporting actors are indicated with a single tick ✓

4.2 System intervention 2 – Significantly expand economically viable recycling

To promote the recycling of plastics, key enabling measures must be implemented simultaneously: (i) enhance product design for recycling through an efficient EPR scheme; (ii) promote recycling technology through incentives, subsidies and landfill limits; (iii) enhance recycled plastics market by developing standards, green procurement and disincentivizing the use of virgin plastics; and (iv) recognize the informal economy and limit the import of plastic scrap. The national government will play a key role while consumers and plastic producers are also very important stakeholders in enabling these conditions.

Significantly expanding economically viable recycling requires multiple actions to combine. Most importantly, scaling the markets for recycled materials so they can fuel growth requires both policy and economic support. Scaling the existing recycling industry requires input from plastics manufacturers as well as policy and infrastructure support from governments. Implementing EPR measures and standards to improve recyclability and incentivize collection for recycling is essential. Engaging the petrochemical industry to align with recycling technologies and innovate new solutions that incorporate post-consumer feedstock instead of virgin plastic is also critical.

The required policy, economic and social innovation-focused actions to create the enabling environment for success are:

- **EPR measures that incentivize innovation to improve recyclability.** Policy interventions are needed that clearly identify the required actions of obliged parties, such as incentivizing producers to consider what happens to their products once used. Policy should also ensure that all materials produced are recyclable, both technically and economically. One policy option could be fee modulation based on recyclability.
- **Design-for-recycling standards.** Design for recycling is a critical component to increasing recycling rates and the value obtained from recycling. Collaboration is needed throughout the plastics value chain, with government stakeholders, academia and other research bodies setting the design-for-recycling standards.[94] These standards should incorporate an intersectional gender analysis and address the needs of marginalized and disproportionately affected communities as well as existing consumer preferences.
- **Increased public and private sector R&D investment into design and innovation for recycling.** This includes support for further innovation to enable brand differentiation and product delivery without the contamination associated with mixed polymer (multimaterial) use. In addition, enable and incentivize local innovators to develop locally and culturally appropriate product and packaging designs and new business models that consider the livelihood of women and informal economy workers.
- **Promote behaviour change efforts.** Behaviour change efforts for design-for-recycling will need to promote and fund at-source segregate and separate collection systems for recyclable and non-recyclable waste. Engaging with communities and enforcing behaviour will help sustain change.
- **Support the market for recycled plastics.** Policy options include establishing targets for recycled content, ensuring that green public procurement policies incorporate requirements for recycled content, creating EPR devices, such as eco-modulation of fees or price incentives (as highlighted in section 3), and running extensive consumer campaigns to build awareness and demand for recycled materials.
- **Make the alternatives to recycling less attractive.** Policy options that increase tariffs or fees for disposal make recycling a more economical option and incentivize the public and private sectors to choose recycling. Additionally, if governments and other funding bodies increase and de-risk investment into recycling initiatives, it will make recycling even more attractive. Policy can also be used to gradually limit landfilling and regulate a deposit for recovery scheme once landfills close.
- **Gradually disincentivize the use of virgin plastics.** This can be achieved through policies that help drive down the demand for virgin plastics, especially when low oil prices discourage demand for generally higher-priced recycled materials. Taxes

or other economic disincentives for virgin plastics will help raise demand for recycled plastics.

- **Incentives and subsidies to support recycling technologies that are locally and culturally appropriate** help policy-makers scale local recycling capacity. This better prepares the industry to accommodate the additional plastics diverted through the simultaneous deployment of other system interventions.

- **Standards and certifications for the quality of recycled materials.** Policy options that ensure good standards for recycling output are critical for boosting demand for quality recycled content. By verifying that environmental, health and safety standards are maintained through the recycling processes, policy makers can ensure that low quality operators don't spoil the market for recycled products. Appropriate standards will also maintain consumer trust in products which use recycled materials. Moreover, higher quality recycled content commands a better price, so policies that improve quality make the recycling industry more investable.

- **Recognize the informal economy.** Policy options that support, integrate and allow for the continued participation of the informal economy are an important part of the overall solution. Mobilizing the informal economy, without necessarily formalizing it, by providing access to technology, equipment, healthcare, safe working conditions (including protection against gender-based violence), social protection, insurance, financial rewards and training will be vital. Promoting cooperatives and unions is one way to achieve improved conditions for the informal economy and enhance its power and voice within policy development, creating opportunities to transition to the formal sector if desired and establishing networks. Gender equality and social inclusion should be promoted too, recognizing the role of women in informal waste management and identifying gender-specific opportunities to improve the quality of life for women who work there.

- **Control the import of plastic scrap.** Viet Nam still depends on imported virgin and scrap materials for plastic production. It's essential to swiftly and strictly control the importation of plastic recyclables for domestic production (but not for recycling to plastic pellets and exportation) and to promote the recycling of domestic scrap.

Table 5: Actions needed to significantly expand economically viable recycling

Sub-interventions	Actions / Policy options	National government	Consumer goods industry	Petrochemical and plastic manufacturers	Waste management sector (formal and informal)	Civil society organizations
Design products and packaging for recycling	**EPR** to shift burden of designing for recyclability to producers, incorporating intersectional gender analysis and needs of marginalized and affected communities	✓✓		✓✓		✓
	Regulation restricting polymer types and product designs which inhibit recycling	✓✓				
	Labelling requirements to inform recycling methods	✓✓	✓✓			
	Statutory targets for recycled content usage	✓✓				
	Funding and incentives for locally and culturally appropriate product and packaging design and business models that consider diverse consumers' preferences and needs	✓✓	✓✓	✓		✓✓
	Voluntary commitments to design for recycling and to increase recycled content		✓✓			

Table 5 Continued

Sub-interventions	Actions / Policy options	National government	Consumer goods industry	Petrochemical and plastic manufacturers	Waste management sector (formal and informal)	Civil society organizations
Make the recycling system economically viable for growth by way of policies and economic instruments	**Statutory targets** for plastic recycling rates	✓✓			✓✓	
	EPR to shift the burden for collection and recycling of packaging to industry	✓✓	✓	✓	✓✓	
	Voluntary commitments to expand collection and recycling of packaging through EPR tools such as price incentives		✓✓	✓✓	✓✓	
	Removal of subsidies to virgin plastic production	✓✓				
	Fund gender-sensitive **behaviour change communication campaign** for source segregation and appropriate recycling behaviour	✓✓	✓	✓	✓✓	✓✓
	Recognition and support to the informal economy through access to innovative technologies and equipment, health care, safe working conditions (including protection against gender-based violence), social protection, insurance, financial benefits and training. Create opportunities to transition to formal sector, and/or establish networks/collectives to boost the sector's power and voice in waste -management policy-making. Enhance bid capacity for informal economy to get government contracts	✓✓	✓	✓	✓✓	✓
	Scaling investments in mechanical recycling and plastic-to-fuel conversion capacity	✓	✓✓	✓✓		✓

Note: Key actors are indicated with two ticks ✓✓ while supporting actors are indicated with a single tick ✓

4.3 System intervention 3 – Expansion of MSW collection coverage, safe disposal and littering prevention

To improve MSW collection coverage, safe disposal and litter prevention, key enabling conditions include: increased funding and allocation of budget for expanded collection coverage and proper waste disposal sites; stricter enforcement of leakage control measures at landfills and dumpsites; implementing behaviour change actions and; applying pay-as-you-throw mechanisms. The key stakeholders needing to implement these measures are national and local governments, collection companies, research institutions and civic bodies.

This intervention requires strong government action at both national and local levels to ensure proper collection and disposal of all waste, including plastics. Allocating national budgets to scaling waste management may help attract additional institutional funding to support the high infrastructure costs, including transportation and logistics, disposal sites, sorting facilities, composting amenities and waste-to-energy plants.

The required policy, economic and innovation-focused actions to create the enabling environment for success are:

- **Increased funding and state budgets to expand collection coverage and proper waste disposal sites.** The biggest challenge to waste collection and safe disposal is that limited funding means limited infrastructure, in terms of both collection capacity and frequency. To achieve waste collection targets, a sizeable investment in logistics, planning and infrastructure is needed. As can be seen in Figure 21, the total additional funds required between 2018 to 2030 to achieve the ***realistic*** SCS (compared to BAU ***do-nothing*** scenario) is estimated to be ~$2.7 billion for MSW capex and opex. As a comparison, the difference in cost between the ***realistic*** SCS and BAU ***maintain*** is an increase of ~$600 million. Increased access to engineered landfills and other waste treatment facilities, coupled with strict enforcement of anti-dumping legislation, is necessary to divert waste away from dumpsites and prevent it leaking into the environment. Access to land and logistics is required to build additional landfills, and, in the long term, direct landfilling of MSW must be restricted.

For this intervention, the chart below illustrates the capital expenditure (capex) and operating expenditure (opex) needed for plastic and non-plastic waste management under the three scenarios. The significant increase in total waste management cost between the do-nothing and maintain scenarios is due to the capital expenditure associated with the increased waste collection and treatment capacities.

Please see **appendix I** for further cost information.

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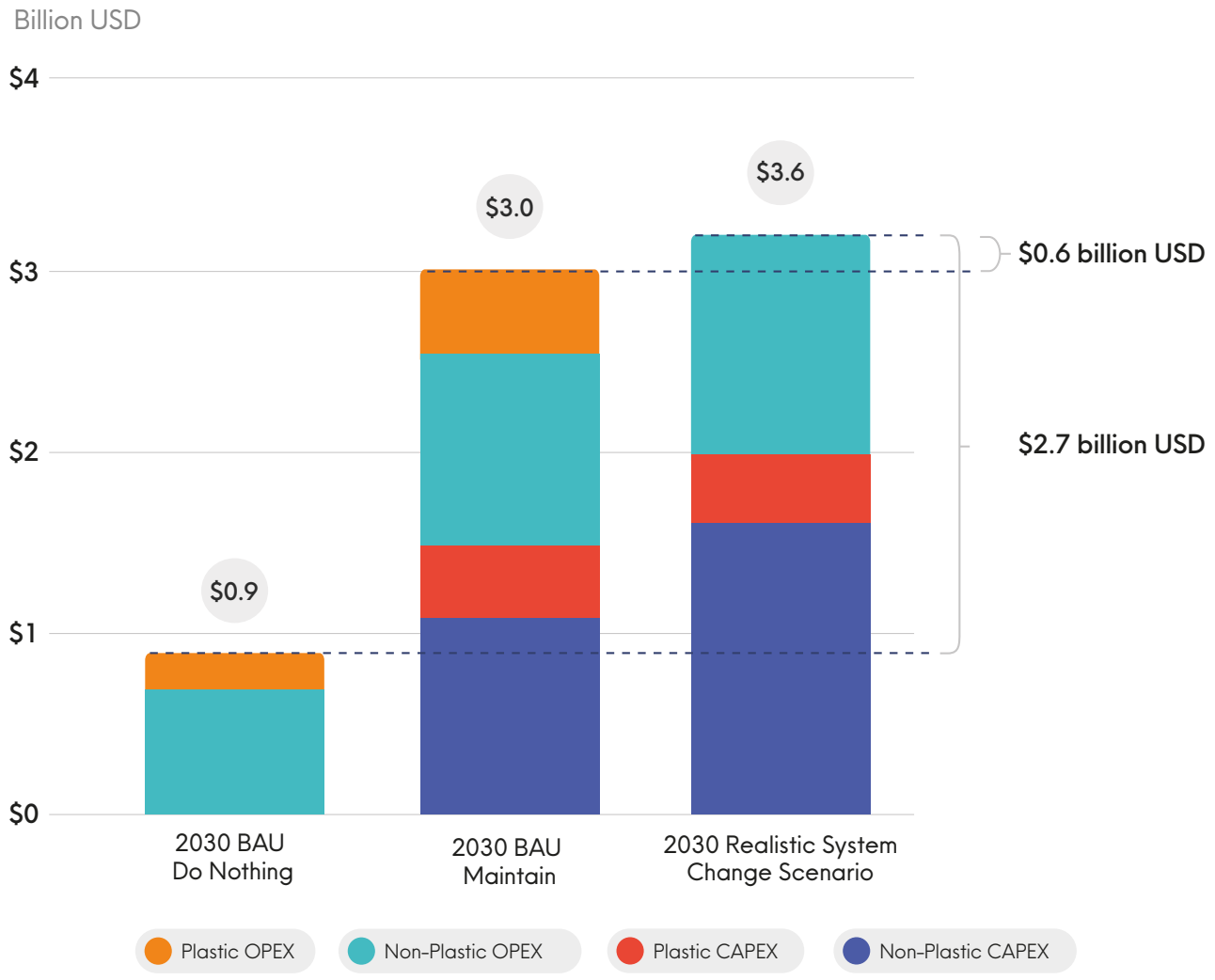
Figure 21: Cost difference between 2030 *BAU do-nothing scenario, 2030 BAU maintain scenario and 2030 realistic scenario*



Note: The unrounded costs for the BAU do-nothing, BAU maintain and *realistic* scenarios are $893,330,600, $2,998,466,800 and $3,599,860,800 respectively.

- **Stricter enforcement of leakage control measures at landfills and dumpsites.** It's critical to enforce leakage control measures at existing dumpsites and landfills. Special surveillance of leakage spots by a task force ready to fix and prevent waste leaks should be allied with awareness raising among the informal economy operating at landfills and dumpsites on how to restrict leakage. These initiatives require national legislation, local government support and regular reviews of the progress of transition from dumpsites to engineered landfills.

- **Behaviour change.** There should be strict regulation on the ban of discharge of plastic waste into waterways. Nationwide behaviour change campaigns must be accompanied by efforts to collect more waste. National and local media agencies should be mobilized as key drivers in awareness-raising campaigns. Strong enforcement of anti-littering regulations, in addition to encouraging source segregation of waste, is important too. To ensure continued commitment and no return to old habits, a system of targets and reviews should be implemented. The roadmap should ensure that the informal economy isn't disadvantaged by or excluded from any dialogue aimed at developing specific guidelines or actions on behaviour change; these activities must address the challenges faced by women, youth and marginalized groups.

- **Pay-as-you-throw mechanism to reduce solid waste generation.** MSW should be segregated, and disposal charged for based on volume or weight encouraging households to reduce the amount of waste, including plastic waste, they generate. This mechanism has been implemented in countries including Korea and Japan.

- **Recognition and support for the informal economy.** Waste collectors, particularly those in the informal economy, should be provided with skills training. There should also be more funding for infrastructure, equipment, social protection and health insurance for the informal economy, as well as the introduction of pricing tools to ensure transparency, fair income protection for women informal collectors, and engagement with associations and collectives representing informal workers to raise their voices in the policy-making and profit-making processes.

Table 6: Actions needed to expand MSW collection coverage, safe disposal and littering prevention

Sub-interventions	Action	National/ Municipal/ Local government	Private waste collection businesses	Plastics and consumer-good industries	Institutions and civic bodies	Informal waste collection economy
Expand MSW collection coverage in urban and rural areas (to national average of 88% for *realistic* scenario and 95% for ambitious)	**Statutory targets** to expand and improve urban collection from 88% to 95%	✓✓	✓	✓		✓✓
	Statutory targets to improve rural collection from 62% to 80%	✓✓	✓	✓		✓✓
	Funding and expansion of waste collection services, providing incentives for companies to recruit informal waste workers	✓✓	✓		✓	✓
	Statutory targets for source segregation and to improve infrastructure plus incentives for waste segregation at source	✓✓			✓	✓

Table 6 Continued

Sub-interventions	Action	National/ Municipal/ Local government	Private waste collection businesses	Plastics and consumer-goodx industries	Institutions and civic bodies	Informal waste collection economy
Expand controlled disposal to eliminate dumpsites and improve engineered landfills to completely stop plastic leakage (eliminate leakage from engineered landfills by 2023; stop dumpsites by 2028)	**Statutory targets** for proper disposal and engineered landfills. **Funding and expansion** of waste disposal services	✓✓	✓✓			✓
	Regulations to close uncontrolled dumpsites and to prevent illegal dumping or use of closed dumpsites. Regulations to ensure hygienic and safe working conditions for both informal and formal workers at dumpsites	✓✓	✓			✓
	Leakage prevention efforts in existing dumpsites and landfills	✓✓	✓			
	Statutory targets and funding for composting and waste-to-energy facilities	✓✓	✓✓		✓	✓
Significantly reduce littering via behaviour change campaigns, fines and cleaning.	**Funding and investment** in extensive behaviour change campaigns that target diverse demographics and audiences	✓✓		✓	✓	
	Regulations promoting zero tolerance of littering through taxes and fines	✓✓			✓	
Enhancing the role and capacity of informal economy in waste collection and disposal	Map, engage and organize **informal workers into associations and cooperatives** to give them voice and agency in waste management policy-making	✓✓			✓✓	✓✓
	Enhance informal economy's access to infrastructure, equipment and technology to share waste collection opportunities. Provide skills training, capacity building, social protection, health insurance and safe working conditions (for example, protection against gender-based violence among women informal collectors)	✓✓	✓✓		✓	✓✓

Note: Key actors are indicated with two ticks ✓✓ while supporting actors are indicated with a single tick ✓

The time is now. These actions need to be taken immediately to avoid more than 900,000 additional tonnes of plastic leaking into waterways.

Achieving the SCS targets demands a multitude of actions with a complex interplay between different stakeholders. Adding to this complexity is the urgency of the situation. With every passing year, the nature and intensity of the necessary interventions gets significantly more challenging. The system change interventions listed in this report, while feasible, are extremely ***ambitious*** and must be embarked upon without delay. The model used for this roadmap shows that delaying the implementation of system change interventions until 2025 will result in more than 907,000 tonnes of additional plastic leakage into the waterways, as per Figure 22 below. Although progress in some policy areas is being made in Viet Nam through the Law on Environmental Protection 2020 (Box 6), the country should immediately enact the SCS interventions and enabling conditions.

As there are other programmes on plastic waste reduction being managed by partners and multilateral and bilateral development agencies, all bodies should work together to avoid duplicating efforts and achieve common goals. Furthermore, solutions should be conducted with a co-benefit approach in mind, resolving plastic pollution but also addressing other developmental stressors, such as climate change, air and water pollution and biodiversity loss.

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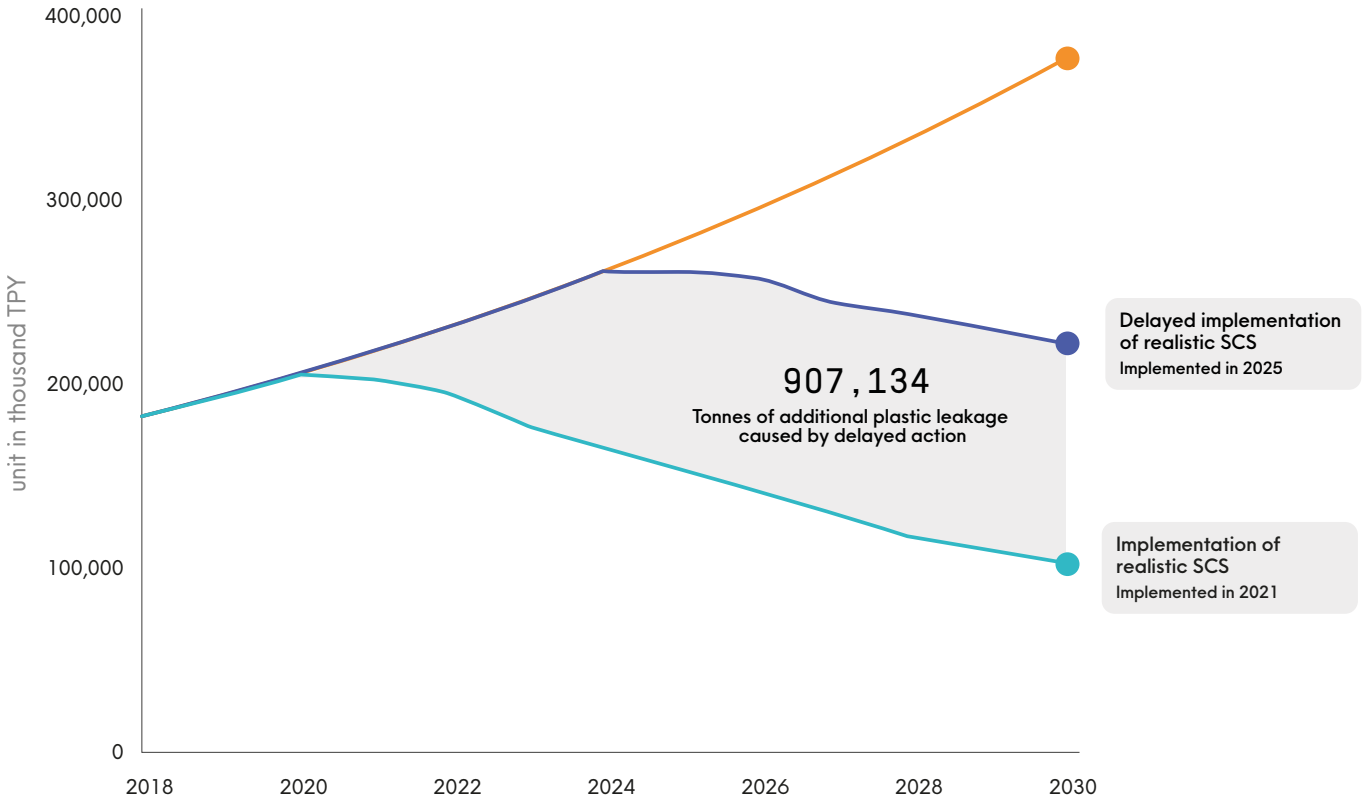
The model used for this roadmap shows that delaying the implementation of system change interventions until 2025 will result in more than 907,000 tonnes of additional plastic leakage into the waterways.

Figure 22: Implications of delaying the implementation of *realistic* SCS for plastic leakage into the ocean



Box 6: Policy progress on plastic waste management in Viet Nam

The circular economy has been institutionalized by the Law on Environmental Protection (LEP) 2020

The circular economy (CE) concept has been defined by LEP 2020 as economic models which reduce resource and materials use, expand the life cycle of products and materials, reduce waste and limit environmental impacts. The CE will be integrated into policy and plans, and the government will issue enabling policies for its development. Decree 08/2022/ND-CP stipulating details of a number of articles of LEP 2020 has established criteria for the CE. It requires a national action plan on the CE to be developed (LEP 2020, Article 142; Decree 08/2022/ND-CP, Article 138-140).

Extended producer responsibility (EPR) has been introduced to promote plastic recycling

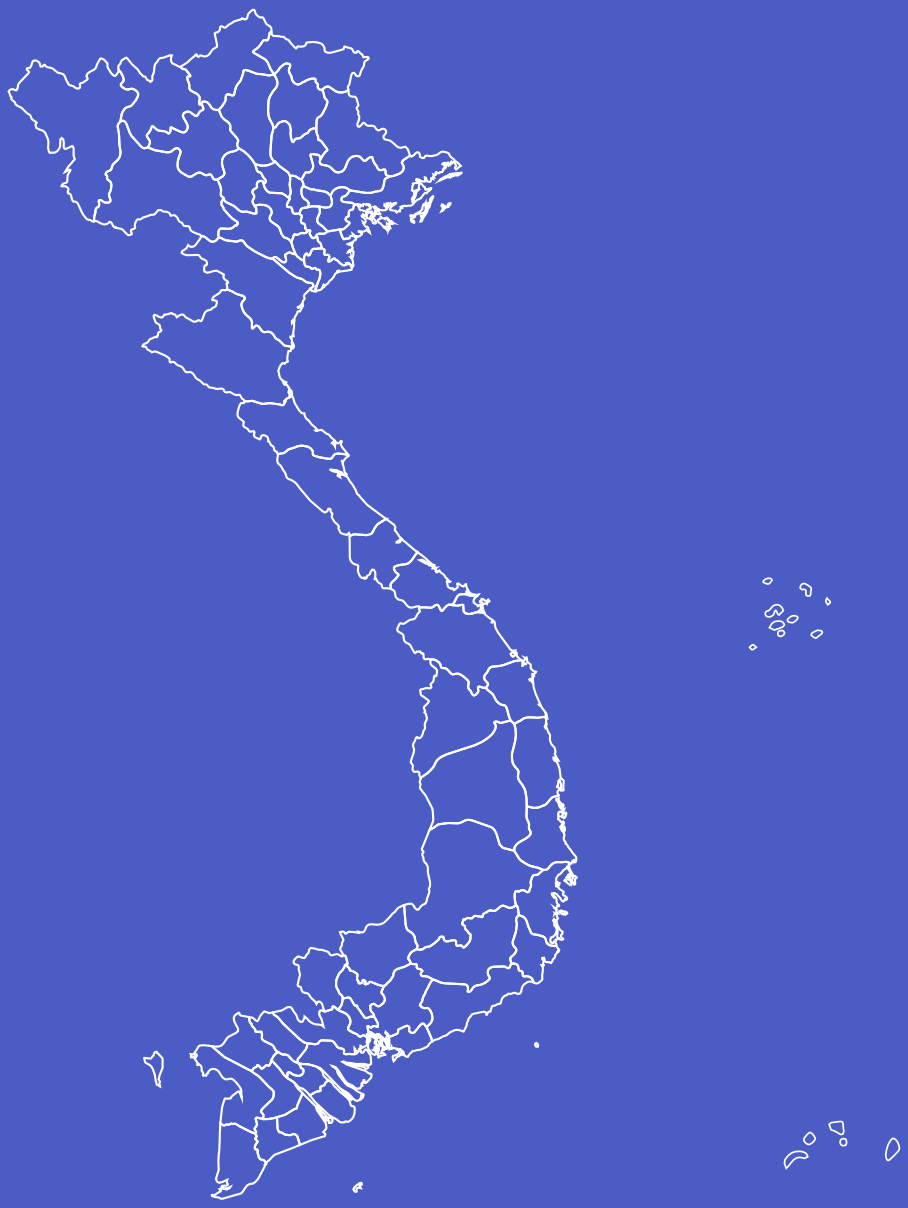
The LEP 2020 and Decree 08/2022/ND-CP regulate that producers and importers have to collect and recycle six categories of packaging and discarded products: (i) packaging (including plastic), (ii) technical oils, (iii) batteries, (iv) tyres, (v) electrical and electronic products, and (vi) end-of-life vehicles. Each producer has its own recycling target for each product. The importers and producers must collect and recycle products and packaging or pay a recycling fee to the environmental protection fund, which uses the fee to organize collection and recycling. For recycling, there are three options for producers and importers to choose: (i) recycle themselves, (ii) contract with a recycling company, or (iii) empower a third organization (PRO) to implement collection and recycling.

Work to reduce, collect and safely dispose of waste and plastic waste is underway

Ban of *non-degradable single-use plastic bags and other single-use plastics*. From 2026, LEP 2020 and the Decree 08/2022/ND-CP prohibit the use of non-degradable plastic bags and SUP in supermarket, malls, resorts and hotels. After 2030, the production and importation of SUP, plastic bags and goods containing microplastics will stop.

Enforcement of at-source segregation of MSW and commencement of pay-as-you-throw mechanism. MSW is segregated into three categories: (i) recyclable, (ii) food waste, and (iii) other (LEP 2020, Article 75). The segregation and pay-as-you-throw mechanisms will begin by 31 December 2024 at the latest. The LEP bans the discharge of plastic into waterways from 2022 (Article 73), and the National Strategy on Environmental Protection (NSEP) guides an increase in waste collection.

Landfilling is being gradually restricted, and landfill facilities must pay a deposit for environmental recovery. The LEP 2020 requires the creation of a roadmap to limit direct landfilling of MSW (Article 78). The NSEP sets a nationwide maximum target of 30% MSW to be landfilled in 2025 and 10% in 2030. On top of this, landfill owners must pay into a deposit for recovery fund for restoration of the environment after a landfill is closed (LEP 2020, Article 137).



05

Case studies of locally led and locally driven actions in Viet Nam

Case Study 1:

Reduce and substitute

Initiative name: AnEco: 100% compostable plastics products

Organization name: An Phat Holdings (APH)
Resources: https://anphatholdings.com/ and https://aneco.com.vn/vi/

Fast facts:

- APH's brand *AnEco* replaces conventional non-biodegradable single-use plastics with single-use products made of 100% compostable materials.
- In 2021, APH sold more than 10,000 tonnes of compostable single-use products, reducing the volume of conventional plastic products leaked into the environment.

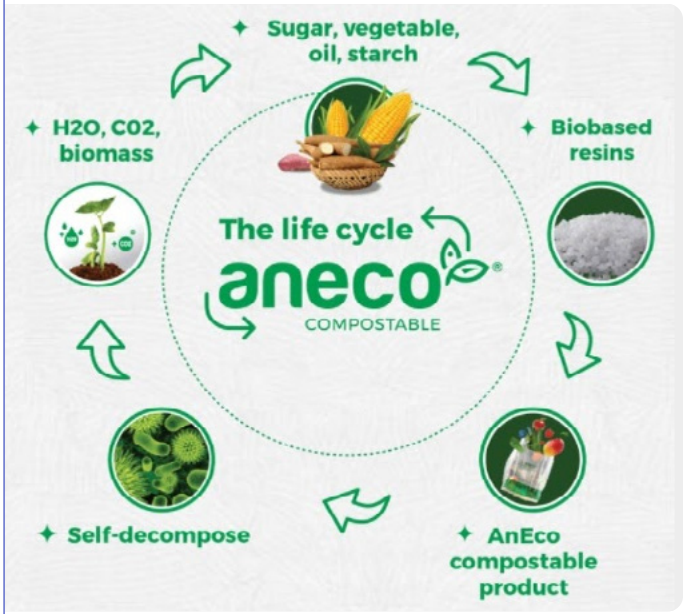
Challenge addressed: In Viet Nam, around 3.7 million tonnes of plastic waste is generated annually. Of this total, 1.5 million tonnes is unmanaged and 182,000 tonnes leaks into the ocean every year. As well as the ongoing downstream efforts – collection, sorting and recycling – there's an urgent need for upstream innovation to reduce waste by substituting plastic products with compostable alternatives. APH has designed a solution that addresses the following complex challenges:

High price of raw materials leads to high selling price of products

- Limited public awareness makes it challenging to change consumer behaviour around single-use plastic products.
- Lack of standards and certificates for compostable materials in many countries, including Viet Nam.
- Competition from oxo-degradable plastic products which are now banned in many developed countries.

Action taken: APH's brand *AnEco* replaces single-use products made of conventional non-biodegradable plastics with single-use products made of 100% compostable materials which are renewable and sustainable (including bags, tableware, straws, wraps and cutlery).

Impact achieved: *AnEco* has contributed to changing consumer habits concerning the use of plastic products, subsequently reducing the volume of plastics leaked into the environment. As an ecosystem of local enterprises, APH aims to create an incentivized value chain that encourages the use of natural, renewable, bio-degradable and sustainable materials. As the leading plastics company in Viet Nam, APH can play an important role in helping to make Vietnamese businesses greener and more sustainable.



Case Study 2:

Reduce and substitute

Initiative name: Refill

Organization name: Environment for Humanity Social Enterprise (EHSE)

Resources: http://refillday.vn/

Fast facts: By encouraging consumers' use of refillable containers, Refill aims to reduce single-use plastics and limit virgin plastic from entering the environment.
The initiative partners with the national Women's Union and the Youth League to create jobs for women and young people who often face greater barriers to employment in Viet Nam.

Challenge addressed: There's no viable alternative to essential fast-moving consumer goods (FMCG) sold in plastic containers. aims to provide that alternative and, ultimately, reduce the amount of plastic leaking into the environment.

Action taken: Refill is an innovative concept synthesizing two existing ideas of motorbike delivery and refill shops. It provides a convenient alternative to single-use plastic by refilling FMCG products into reusable containers at customers' homes and offices. Through its partnership with the Women's Union, Refill has created refill stations in local communities around Viet Nam.

Results achieved: Through its waste audit research,EHSE examined 59 households and identified that 33% of a household's rubbish is plastic, with each person generating three litres of rubbish per day, about one litre of which is plastic. Refilling products into reusable containers an estimated 0.85 litres. There are currently two refill shops, one in Ho Chi Minh City and the other in Ha Long (Quang Ninh province), and plans for expansion are ongoing.

Case Study 3:

Recycle

Initiative name: A Pilot Project on Multi-stakeholder Collaboration to Establish Plastic Circular Economy Model in Viet Nam

Organization name: Center for Environment and Community Research (CECR), with support and funding from Dow Viet Nam

Fast facts:
A pilot circular economy model for low-value and hard-to-recycle plastic waste that connects all stakeholders in the value chain. The project partners are:

- CECR
- Women's Union and households in Hoan Kiem district, Hanoi
- URENCO Hanoi and informal waste collectors
- Hoan Kiem district authorities
- Hoa Viet and Vinh Thanh, private recyclers that convert waste into useful applications.

Challenge addressed: Urban domestic waste has doubled over the past 15 years, but very little is collected for recycling. In Hoan Kiem, the central district of Hanoi, low-value plastic waste is estimated to be 292 tonnes per year for a population of only around 135,000 people. To improve the district's sustainability, it's important to connect all stakeholders in the value chain and create economic value for waste through recycling and upcycling.

Action taken: With support and funding from Dow Viet Nam, CECR has been actively working with all stakeholders to co-ordinate a pilot circular economy project in Hoan Kiem district that includes three strategic pillars:

- Education and behaviour change: a series of workshops with households to raise awareness of the value of waste and improve segregation and collection.
- Waste segregation and management: a full pilot model (from collection and segregation to recycling) that can be rolled out to other areas.
- Innovation and technology: private recyclers are actively and directly involved throughout to ensure the waste produced is suitable for recycling.

Impact achieved: The holistic approach of the pilot project can be rolled out to other localities. The project will identify what support is needed (both financial and non-financial) which will be vital detail for the incoming regulations on extended producer responsibility (EPR).

Case Study 4:

Collect and dispose

Initiative name: Municipal Plastic Waste Management in World Heritage Ha Long Bay, Viet Nam

Organization name: Centre for Marinelife Conservation and Community Development (MCD)

Resource: http://mcdvietnam.org/category/projects/mcd-69/

Fast facts:

- Successfully implemented a pilot model to improve the efficiency of waste management in the coastal area of World Natural Heritage site, Ha Long Bay.
- Promoted innovative waste collection, sorting and treatment activities in the project area.
- After two years of project implementation, more than 500 tonnes of plastic waste were collected through the project guidance, support and promotion, contributing to the reduction of marine plastic waste and environmental protection in Ha Long Bay.

Challenge addressed: Insufficient collection and improper disposal of municipal and marine plastic waste, including leakage into the sea, are key challenges at Ha Long Bay. Local authorities and communities urgently need capacity building, technical and administrative support to improve waste management.

Action taken: The project, which operated between 2018 and 2020, used an integrated coastal-zone management approach and a source-to-sea perspective. It aimed to improve the collection, sorting and treatment processes of on- and off-shore solid and plastics waste in the coastal areas of Ha Long Bay, reducing plastic pollution into the marine environment.

Impact achieved: 1,902 people engaged in capacity building activities (via trainings and awareness-raising sessions); 111,321 people were directly involved In project activities (63% women, 92% youth); and 2,628,433 people accessed project information. The project engaged 15 agencies, businesses and community organizations and covered a large number of local communities to improve solid waste management and reduce plastic waste. During two years of the project, more than 500 tonnes of plastic waste was collected.

Case Study 5:

Inform policy

Initiative name: Science-based decision and multisectoral participation in shaping the action plan for reducing plastic waste in fisheries sector

Organization name: IUCN

Resource: https://www.iucn.org/news/viet-nam/202103/viet-nam-develops-action-plan-reducing-plastic-waste-fisheries-sector

Challenge addressed:

- Plastic waste spoils beach landscapes and negatively affects the marine economy, including fishing and tourism activities. Floating abandoned fishing nets (ghost nets) are also recognized as a threat to marine life and fishing.
- The Government of Viet Nam has set a target to eliminate all single-use plastic products and bags at beaches, marine protected areas (MPA) and coastal tourist attractions by 2030. However, there has been lack of quantitative analysis or plastic pollution monitoring and assessment to guide the actions at the provincial and local levels.

Action taken:

- Between 2019 and 2020, IUCN Viet Nam, GreenHub and WWF-Viet Nam joined forces with the management boards of 11 MPAs and National Parks to conduct seasonal monitoring and assessment of beach debris. This was the first quantitative study of plastic waste in coastal Viet Nam.
- In October 2019, IUCN and the Viet Nam Directorate of Fisheries at the Ministry of Agriculture and Rural Development (MARD) co-hosted the first national workshop, *Ocean Plastic Pollution: Action Plan of the Fisheries Sector*. The workshop kickstarted the development of an action plan on plastic waste management by the fisheries sector.

Result: On 5 February 2021, MARD issued Decision 687/QD-BNN-TCTS approving the action plan on marine plastic waste management in the fisheries sector (2020 to 2030). Public-private partnerships and multi-stakeholder participation have been central to supporting the action plan's development, with IUCN Viet Nam one of the primary partners.

Impact achieved: The fisheries sector pioneered the issuance of a sector-specific action plan to tackle plastic waste pollution. This is the foundation for consistent and challenging measures to eliminate and reduce plastic waste leakage from the economic activities of fisheries. IUCN, through the MARPLASTIC project and national partners, is committed to providing technical and financial support to implement the priorities of the action plan.

Case Study 6:

Inform policy

Initiative name: Viet Nam's active role in developing a new legally binding global agreement on plastic pollution

Organization name: WWF-Viet Nam

Resource: https://vietnam.panda.org/en/?uNewsID=369576

Challenge addressed: Despite Viet Nam's recent efforts in tackling the issue at the national level, plastic pollution remains a transboundary, cross-sectoral problem. A new legally binding global agreement on plastic pollution, addressing the plastic life cycle, is fundamental to Viet Nam's - and the world's - efforts to solve the problem at pace and scale.

Action taken: Since 2019, WWF-Viet Nam has assisted the Government of Viet Nam, with input from the Ministry of Natural Resources and Environment, by providing analyses and evidence-based recommendations towards a new, international agreement. WWF-VN provided technical and operational support for Viet Nam in regional and international dialogues (by, for example, sharing technical and geopolitical information, strategic communication for capacity building, assistance for international exposure and government projections).

Result: In September 2021, Viet Nam led calls for a new agreement by co-hosting (with Ecuador, Germany and Ghana) the first global Ministerial Conference on Marine Litter and Plastic Pollution. Most importantly, the Prime Minister's Decision No. 1407/QD-TTg in August 2021 approved the "Viet Nam actively prepares for and participates in the formulation of a Global Agreement on Marine Plastic Pollution" proposal, giving the country a clear position from which to negotiate for an agreement.

Impact achieved: Over the last two years, the Government of Viet Nam has become a vocal supporter of a global agreement on plastic pollution. Through a succession of statements and declarations, Viet Nam reaffirmed its support for an agreement at the fourth ad-hoc, open-ended expert group on marine litter and microplastics (AHEG-4) meeting and the SEA of Solutions 2020 Conference, and, in solidarity with nearly 80 UN member states, called for the rapid commencement of negotiations by endorsing the Ocean Day Plastic Pollution Declaration. Governments are expected to adopt a formal negotiation mandate at the fifth session of the UN Environment Assembly in February 2022 as a precursor to agreement negotiations that could require states to eliminate the direct and indirect discharge of plastic into oceans.

Case Study 7:

Boost innovation

Initiative name: Maximize the Collected Recyclable Packaging Waste by Improving Waste Segregation at Source

Organization name: PRO Viet Nam - Packaging Recycling Organization Viet Nam (PROVN)

Resource: https://provietnam.com.vn/en/

Fun facts:
In collaboration with a number of stakeholders and partners, PROVN launched a variety of communication and waste collection activities targeted at consumers, students, households and informal collectors to encourage segregation at source.

- Stream 1: Improve waste collection capabilities and infrastructure by establishing a recyclable packaging waste buy-back centre in Ho Chi Minh City.
- Stream 2: Improve awareness and education about waste segregation at source via waste collection and communication to 1,000 schools.
- Stream 3: Improve awareness and education about waste segregation at source via waste collection and communication to households.
- Stream 4: Improve awareness and education about waste segregation at source via waste collection and communication to consumers in supermarkets and shopping malls.

Challenge addressed: Inefficient at-source segregation has always been a challenge for solid waste management in Viet Nam. Effort is needed to create a convenient and clear waste segregation procedure and public behaviour change. PROVN set very ambitious goals for the project, with seven key partners working together on activities across four streams.

Action taken: Launched in May 2021 with the support of CL2B, a circular economy acceleration firm, and ICED (The Institute for Circular Economy Development), the project has already taken key actions:

- The team has built the approach and baseline of stakeholder understanding. This will particularly help gauge the motivation of consumers, households and informal workers to contribute to segregation at source.
- Several activities have commenced, including waste collection and communication at 23 Saigon-Co.opMart stores – one of the biggest supermarket chains in Ho Chi Minh City.
- The buy-back centre for recyclable waste is under construction and is expected to open in March 2022.
- PROVN responded quickly to the COVID-19 pandemic, adding new activities to support front-line waste collectors.

Impact achieved: By testing different assumptions for various municipal waste streams, the project expects to:

- Validate the potential volume, quality and feasibility of collecting both high-value (PET) and low-value (UBC, laminates) recyclable packaging waste from the source of its generation.
- Leverage local waste collection capabilities and awareness to maximize the amount of recyclable waste collected.
- Reduce the impacts of solid waste mismanagement on the environment.
- Create recyclable packaging networks of environmentally conscious communities, ethical collectors and recyclers.

PROVN's Manifesto

Vision
To be a key contributor in making Viet nam green, clean and beautiful

Mission
To drive the circular economy in Viet nam and make packaging recycling more accessible and sustainable

Ambition
By 2030, all packaging material that its members put into the market shall have the ability to be collected for recycling

PROVN waste collection bin at one of 23 Saigon Co.opMart stores testing waste collection from retailers.

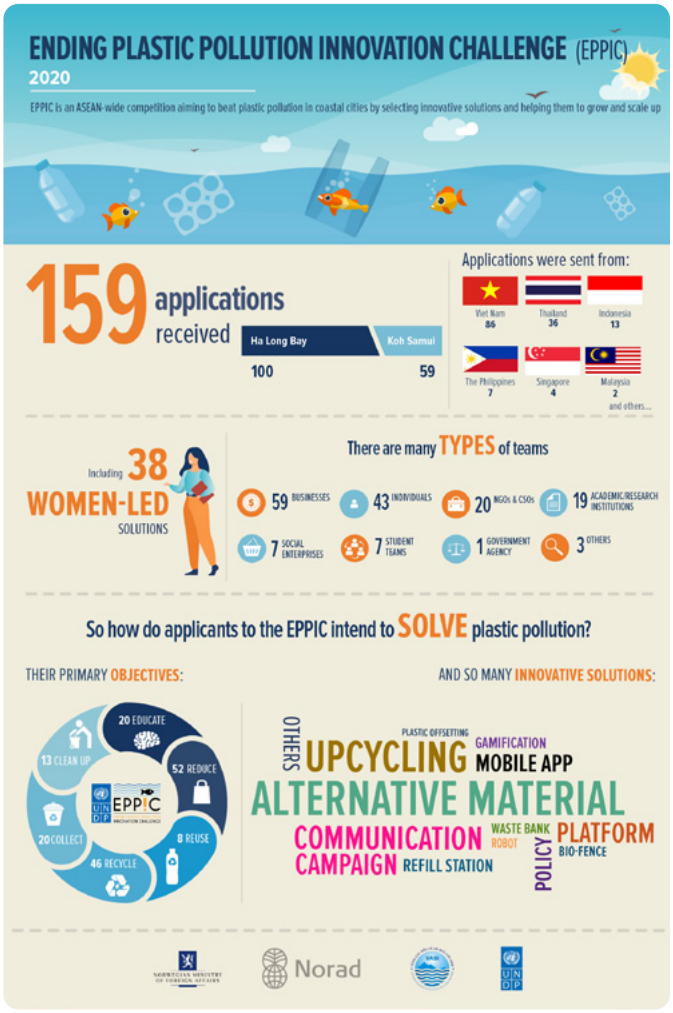
Case Study 8:

Boost innovation

Initiative name: Ending Plastic Pollution Innovation Challenge (EPPIC)

Organization name: UNDP Viet Nam

Resource: http://www.plasticchallenge.undp.org.vn/ and https://www.vn.undp.org/content/vietnam/en/home/library/environment_climate/15-lessons-learned-from-running-an-innovation-competition-to-tac.html



Fast facts:

- Phase one of the innovation challenge attracted 159 applications, with 14 teams selected for a 12-month incubation programme to fine tune, implement and scale up their innovations in Ha Long Bay, Koh Samui, and across ASEAN member states. These teams are seeking a combined investment of more than $300,000.
- Phase 2 saw another 139 applications, and, this time, 18 finalists were selected to develop their initiatives for addressing plastic pollution in Indonesia and the Philippines.

Challenge addressed: This project aimed to get innovators thinking about a dynamic circular economy for plastics instead of a linear take-make-waste model. The principles of EPPIC were to make innovations part of a supportive local ecosystem and ensure that the programme's ambassadors were ready for their next challenges regardless of their success in the competition.

Action taken: EPPIC is looking for grassroots and scalable solutions to reduce plastic pollution in the ASEAN region. The programme's objective is to narrow the scope of the problem to focus on two project sites (Ha Long Bay in Viet Nam and Koh Samui in Thailand during Phase I), experimenting with creative solutions within predefined areas and developing strategies for scaling up across the wider ASEAN region. Four EPPIC 2020 winners were selected: Galaxy Biotech' breathable biobag made from industrial cassava (tapioca) starch; Green Joy's biodegradable straws made from the natural grass Lepironia, Refill Day's service to refill products from trusted brands and deliver them to customers' homes, and CIRAC's system to transform aluminium-laminated thermoplastic in snack and food packaging into valuable products and materials.

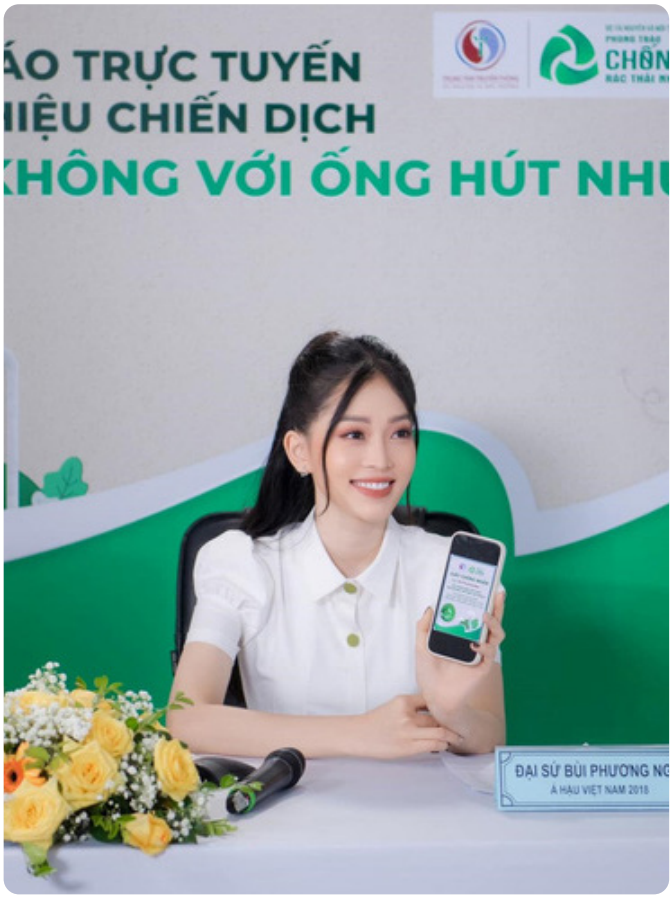
Impact achieved: UNDP has been promoting a portfolio approach to tackling complicated problems, recognizing that siloed interventions fail to deal with today's complex, cross-boundary challenges. As such, the selection process aimed to catalyse the accumulated impact of all innovations as opposed to pushing stand-alone solutions. The EPPIC finalists are a testimony to the rich breadth of this portfolio, which includes alternative materials, upcycling technologies, mobile apps, education campaigns, bio-fences, reuse mechanisms, plastic offsetting, marketplaces and more.

Case Study 9:

Transform behaviour

Initiative name: Say No to Plastic Straws campaign

Organization name: Communication Centre for Natural Resources and Environment, Ministry of Natural Resources and Environment (MoNRE) and Nestlé Viet Nam



Challenge addressed: Plastic straws take 200 to 500 years to decompose and are a huge contributor to plastic pollution. Bold steps and practical initiatives are needed to tackle environmental issues in Viet Nam, especially to encourage the younger generation to create new consumption habits and be mindful of the environment.

Action taken: MoNRE worked with one of the biggest food producers in Viet Nam, Nestlé Viet Nam, to launch the campaign "Say no to plastic straws." As part of its efforts to find more sustainable product alternatives, Nestle Viet Nam has switched from plastic to paper straws for its MILO products. The campaign aims to raise public awareness of the plastics problem, encourage community action and galvanize social change towards sustainability.

Impact achieved: The initiative contributes to raising awareness about the removal of single-use plastics from urban markets, convenience stores and supermarkets in 2021 and the target of a nationwide ban by 2025.

Case Study 10:

Transform behaviour

Initiative name: Empowering Local Women - A Journey of Turning Trash into Flowers

Organization name: Centre for Supporting Green Development (GreenHub)

Resource: https://greenhub.org.vn/pan-coca-cola-foundation/

Fast facts: The project, funded by the Coca Cola Foundation, focused on the empowerment of women as the leverage point to: enhance awareness raising and behaviour change around waste separation, plastic waste collection and recycling; amplify collaboration and knowledge sharing about environmental education, the understanding of health risks and participatory community approaches; and boost efforts to reduce, reuse and recycle (the 3Rs) and develop waste collection models.

Challenge addressed: Ha Long Bay—one of the world's seven wonders of nature and an important coastal tourism destination for Viet Nam—has endured a growing plastic pollution issue that has reached alarming proportions. To transform public perceptions of waste collection operations, a leverage point is needed to ensure equity and inclusivity in designing and implementing sustainable solutions that tackle plastic waste and pollution.

Action taken:

- Implemented an effective network of 30 leaders at national and local levels, comprising local communities, women, youth, local businesses, government and NGOs by mid-2021 through the Plastic Action Network.
- Enhanced community sanitation in Ha Long city by mid-2021 through mobilizing technology pilots for waste reduction and supporting the local women's waste collection model.
- Increased community engagement in 3R actions for plastic by empowering 250 women waste pickers in Ha Long city by mid-2021 through collection and recycling models.
- Supported implementation by 2020 of the Quang Ninh province and national action plans on marine litter developed by the Ministry of Natural Resources and Environment (MONRE).

Impact achieved: Three years after the project's completion, the two models of plastic waste collection and upcycling it into craft products continue to develop and grow under the management of local women in Ha Long city. By integrating the commercialization of reused and recycled products, these models not only help create livelihoods and extra incomes for local women, but also reduce a large amount of waste into the environment, releasing pressure on landfills.

Case Study 11:

Transform behaviour

Initiative name: Rethinking Plastics: circular economy solutions to marine litter (pilot project Plastic Alliance) and the Role of Communication in Changing the Behaviour of Public Community

Organization name: Expertise France and Institute of Strategy and Policy on Natural Resources and Environment (ISPONRE), Ministry of Natural Resources and Environment (MONRE)-Viet Nam

Resource: https://beatplasticpollution.eu/rethinking-plastics/ and https://chungtaygiamnhua.com/trien-lam-anh/

Fast facts: The Plastic Alliance includes 16 supermarkets and retailers committed to reducing the use of single-use plastic bags in Hanoi through various forms of communication, including musical film, online photo exhibitions and singing contests.

Challenge addressed: According to MONRE's statistics, Hanoi and Ho Chi Minh City alone release 80 tonnes of plastics and plastic bags into the environment every day. It's estimated that plastic waste and plastic bags accounts for an average of about eight to 12% of total domestic solid waste nationally. One person uses and discards approximately one plastic bag each day and more than 31.4 billion plastic bags are discarded in Viet Nam each year, of which only 17% are reused. Changing public behaviour towards single-use plastics will require time, effort and, in particular, effective communication tools.

Action taken: Through the Plastic Alliance pilot project, ISPONRE has been utilizing multiple online-offline communication channels and a wide range of materials to advocate, campaign and gradually change the behaviour of customers, retailers and communities around their use of single-use plastic bags, encouraging them to reuse bags for shopping. The wide-ranging forms of communication include musical film, an online photo exhibition and a singing contest.

Result achieved:
An official website (https://chungtaygiamnhua.com/) was created to host a virtual gallery and community outreach events. The website is a part of a national media campaign that combines diverse activities on multiple platforms, including TikTok challenges, public exhibitions and musical video challenges. The project has contributed to reducing ocean plastic waste by advocating, mobilizing and encouraging supermarkets and consumers to utilize reusable bags for shopping.

Photo credit: Bao Dai bieu Nhan Dan.

Photo credit: Bao Tai nguyen Moi truong.

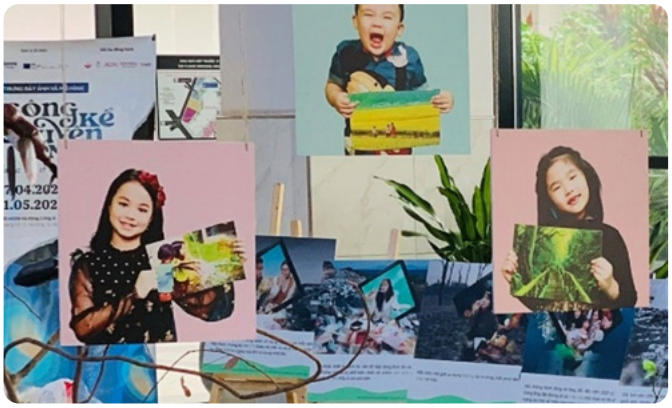


Photo credit: AEON Viet Nam.

Case Study 12:

Transform behaviour

Initiative name: Private sector engagement in plastic waste reduction

Organization name: WWF-Viet Nam

Resource: https://plastic-action.asia/

Fast facts: Forty businesses in the HORECA (food service) sector in Phu Quoc have joined WWF's plastic reduction effort by applying good practices in solid waste management at their properties. As a result of the programme, each business can eliminate 0.017 kg of plastic per capita (guests and staff) per day.

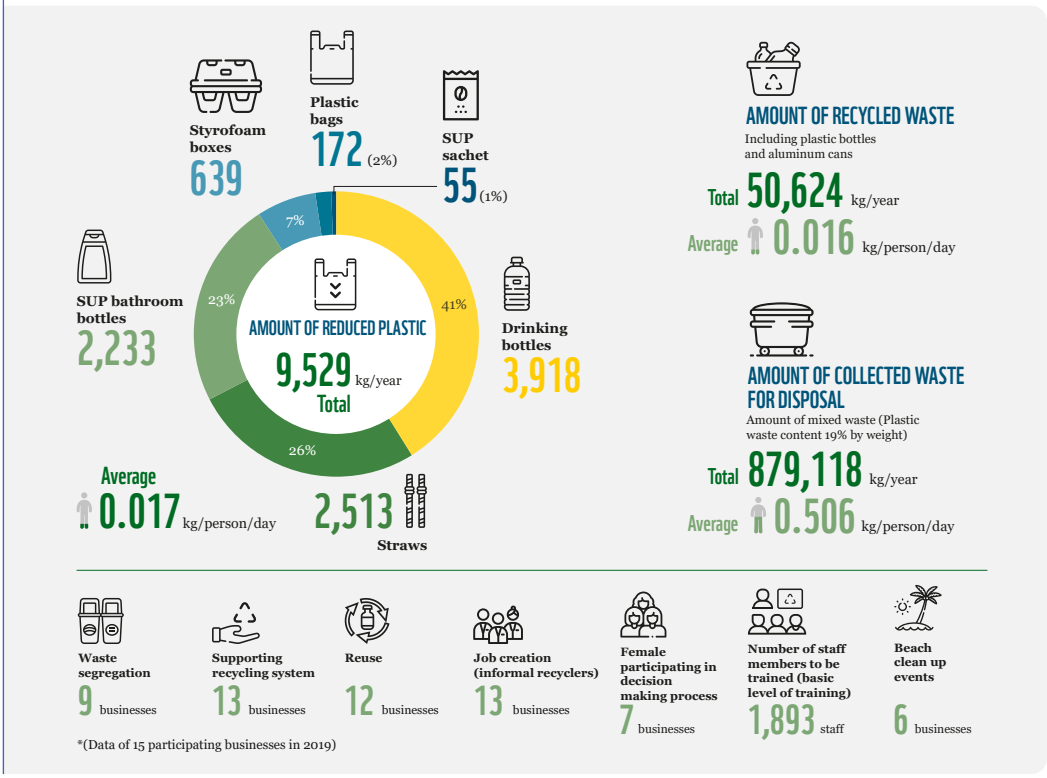
Challenge addressed:

- A lack of framework for public-private partnership and poor support from the local government in terms of coordination and incentivization is a barrier to more businesses joining this initiative.
- Reaching out to businesses individually for engagement and accompanying their journey required time and human resources.
- In 2020 and 2021, the COVID-19 pandemic severely affected HORECA businesses in Phu Quoc, deprioritizing their intention to join this initiative.

Action taken: The objective of this initiative is to encourage businesses in the HORECA sector in Phu Quoc to join a voluntary platform of plastic action that helps protect the island environment from plastic pollution. Between 2018 and 2019, WWF-Viet Nam engaged 40 businesses, comprising 20 companies involved in the tourism sector (resorts, hotels and tour operators) and 20 food and beverage businesses (coffee shops, restaurants, bars and street vendors) to implement best practice and reduce plastic waste in their operations. A performance survey from 15 participating businesses showed a reduction of roughly 9.5 tonnes of plastics and an additional segregation of more than 50 tonnes of recyclable items in 2019. Of all the practices implemented, the project found that:

- The most applied practice was replacing plastic straws with eco-friendly or reusable alternatives.
- The most efficient practice was installing a water-refilling station and replacing plastic water bottles with reusable ones.
- The most challenging practice was reducing plastic bags from suppliers.

Impact achieved: This initiative was the first pilot of a voluntary business platform to implement best practice on plastic action. Its achievements showed promise in engaging the private sector on environmental initiatives. Lessons learned from this initiative helped WWF-Viet Nam shape its national strategy to scale up a business platform on plastic action. Businesses participating in this initiative were recommended to join a wider network like Plastic Action (PACT) to learn and share from others.



Case Study 13:

Promote inclusivity

Initiative name: Support and recognize informal waste collectors as the key actors toward better plastic waste management in Ho Chi Minh City

Organization name: Environment and Development in Action (ENDA Viet Nam)

Fast facts:

- ENDA Viet Nam supports independent waste collectors and street waste pickers to access social protection.
- More than 5,500 independent waste collectors and street waste pickers were engaged and given support, and Dong Tam's Cooperative Alliance and 23 other cooperatives were established, giving legal status to informal workers in waste collection.

Challenge addressed: Independent waste collectors (IWCs) have a vital role in solid waste management in Ho Chi Minh City (the largest municipality in Viet Nam with a population of over 9.2 million people), collecting 60 to 65% of municipal domestic waste (6,000 tonnes/day). IWCs separate waste and supply inputs for recycling systems. Unfortunately, these collectors have low incomes based on collection fees paid by households and must work in high-risk and unsafe conditions, especially during the COVID-19 pandemic.

Action taken: Since 2006, ENDA Viet Nam has helped more than 5,500 IWCs and street waste pickers access social protection through the provision of necessary protective devices, insurances, capacity building and the establishment and strengthening of worker cooperatives. ENDA Viet Nam cooperates continuously with IWCs, working as a bridge to connect them with local authorities and help administrators better understand the difficulties of these informal workforces. ENDA Viet Nam also conducts advocacy to encourage authorities to institute regulations related to IWCs' living and working conditions, in particular in city solid waste management.

Impact achieved: Through governmental advocacy, ENDA Viet Nam has contributed to the improvement of the administrative process, giving informal economies access to social welfare programmes. The programme has supported the establishment of cooperatives and alliances to ensure that IWCs have their own legal status and that their perspectives are considered by authorities and communities.

Appendices

Appendices are available online at globalplasticaction.org/vietnam

Endnotes

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