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A photograph of a person splashing water in a lake at sunset. The person is in the foreground, splashing water upwards. The background is a bright sunset over a body of water, with the sun low on the horizon. The water splashes are illuminated by the golden light of the setting sun.

TOWARDS A TREATY TO END PLASTIC POLLUTION

GLOBAL RULES TO SOLVE
A GLOBAL PROBLEM

About WWF

World Wide Fund for Nature (WWF) is one of the world's largest and most experienced independent conservation organizations, with over 5 million supporters and a global network active in more than 100 countries. WWF's mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature by conserving the world's biological diversity, ensuring the sustainable use of renewable natural resources, and promoting the reduction of pollution and wasteful consumption.

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“ *The negotiations for a plastic pollution treaty mark a pivotal point in history; our actions now – or lack thereof – will influence generations to come in an irreversible way. The volume of plastic in our oceans and broader environment has reached crisis levels and continues to grow exponentially. This requires not just ‘any treaty’ - but one built on global rules that tackle the most polluting plastics through urgent and targeted measures. Now is the time to be bold.*”

Marco Lambertini, Director General, WWF International



“ *Plastic is one of the most useful and versatile materials in existence, but the pollution it causes has now spiralled out of control. As the plastics value chain transcends national boundaries, by definition, we need global rules to address the problem. Fortunately, this approach also brings benefits to businesses by creating a level playing field, incentivizing innovation, and reducing operational complexity across markets.*”

Sam Putt del Pino, Interim Global Markets Practice Leader, WWF International



“ *Successful treaties in the past have demonstrated how strong and fast our collective power can be when governments come together. However, if negotiations focus on the lowest common denominator, this could become an empty treaty – and we will have missed our chance to change our plastics trajectory. I urge each negotiator to bring the ambition and tenacity required to the table, and to hold each other accountable for delivering a decisive treaty.*”

Eirik Lindebjerg, Global Plastics Policy Manager, WWF International



“ *While the ocean is often the final destination of much of the world’s plastic pollution, the impacts are increasingly felt by wildlife and people in every ecosystem. By taking a marine lens, it is possible to use coastal and ocean plastic pollution as an indicator for how well we are cleaning up our activities further up the plastics value chain.*”

Pepe Clarke, Global Oceans Practice Leader, WWF International



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EXECUTIVE SUMMARY

In March 2022, UN member states made the historic decision to develop an international, legally binding instrument to end plastic pollution. This is a unique opportunity to unlock systemic change across the global plastics economy.

An effective treaty will deliver decisive impact across the full value chain. If not structured properly, however, there is a real risk that the new treaty will fall short of what is needed to turn the tide on plastic pollution. Recognizing that many aspects of the proposed treaty will be under consideration during the negotiation process, this report makes three contributions by outlining: 1) global rules as the foundation for an effective treaty; 2) the need to prioritize the most problematic categories of plastic; and 3) the specific policy levers that will be most impactful.

1 APPROACH: GLOBAL RULES ARE ESSENTIAL TO UNLOCK SYSTEMIC CHANGE AT THE REQUIRED SPEED AND SCALE

The failure of existing efforts to curb plastic leakage over the past three decades has demonstrated that we cannot rely on voluntary, country-driven action alone. Even over the past five years, despite 60% growth in national and subnational policies, total plastic in the ocean has increased by more than 50%. This is because voluntary national actions – while likely useful for complementary context-specific measures – do not deliver by themselves on such a global, transboundary problem. Structuring the treaty around voluntary national action would be a continuation of the existing unsuccessful approach.

The unique potential of a global treaty is to hold all signatories to a high common standard of action. This will create a level playing field that incentivizes and supports national actions. The power of moving beyond fragmented national plans is demonstrated by other successful multilateral environmental agreements. For example, through global bans, the Montreal Protocol has phased out more than 99% of ozone-depleting substances since its establishment, setting the ozone layer on a gradual but definite path to recovery.

Governments cannot afford to waste time on approaches that have proven inadequate to date. Plastic pollution is still growing at an exponential rate – during the two-year negotiation period, total plastic pollution in the ocean is expected to increase by 15% – and capabilities for large-scale removal do not yet exist.

Common global rules across the plastics value chain are not only needed to end plastic pollution but will also reduce costs for businesses. Harmonization of the current heterogeneous plastic regulatory landscape would reduce technical complexity, operational costs, and compliance costs. It would also create a level playing field across the plastics value chain, and accelerate innovation by providing policy certainty, reducing risk, and concentrating efforts on common global priorities.

50%

INCREASE IN TOTAL PLASTIC POLLUTION, DESPITE

60%

INCREASE IN NATIONAL POLICIES IN THE LAST FIVE YEARS



COMMON GLOBAL RULES...

...WILL MAKE A GREATER AND FASTER IMPACT...

...AND OFFER BENEFITS TO BUSINESSES AND GOVERNMENTS

THREE PRIORITIES:



SINGLE-USE PLASTICS



FISHING GEAR



MICROPLASTICS

Common global rules would also benefit governments, especially in low-income countries. If each country were to individually develop their own regulatory and technical solutions to stop plastic pollution, the aggregate cost to the international community would be significantly higher than if these activities were undertaken jointly. Additionally, many smaller and low-income countries have limited control over the production and design of plastic items that arrive on their markets, leaving costly waste management as their only option to stop plastic leakage. Global rules – including sustainable upstream solutions – would provide them more predictability and control, reducing their domestic waste management burden.

2 PRIORITIES: THE TREATY MUST PRIORITIZE SINGLE-USE PLASTICS, FISHING GEAR, AND MICROPLASTICS

To be effective, the treaty must address as a priority those plastics most prone to leakage, and most harmful once leaked. According to the best available evidence, single-use plastics, fishing gear, and microplastics together account for practically all plastic leakage.

Single-use plastics represent the largest portion of ocean plastic leakage by weight, owing largely to the scale of production and use patterns for many of these products. Fishing gear accounts for a smaller share of coastal plastic by weight but is more prominent in oceanic gyres (constituting an estimated 80% of the Great Pacific Garbage Patch), and is most deadly to marine life. Finally, microplastics are a rapidly growing category, representing an estimated 20% of all plastic entering the ocean each year, and entering the environment at six times the rate of single-use plastics, relative to production volumes.

3 MEASURES: FOR THESE PRIORITY TYPES OF PLASTIC, THE TREATY MUST REDUCE PRODUCTION OF PROBLEMATIC PLASTICS, MANDATE STANDARDS TO ENABLE CIRCULATION, AND IMPROVE WASTE MANAGEMENT

The global rules must lay out specific, high-impact control measures across the plastic lifecycle. The most effective control measures will inevitably vary from one product (sub-) category to another. Therefore, they should be tailored to each category, based on environmental impact.

These measures can be grouped into three levers:



REDUCE: As a priority, phase-out the production of problematic plastic products and polymers, including toxic chemicals and plastics that cannot be reused or recycled in practice.



CIRCULATE: For most remaining plastics, facilitate a circular economy by mandating strict global product design standards, labeling standards and information-sharing obligations.



MANAGE: Only for critically needed plastics that cannot be reduced or circulated,ⁱ ensure that they do not leak into the environment with safe collection and waste management: strictly regulate landfill and prohibit open dumping, provide support for scaling waste management infrastructure, mandate marking of fishing gear and adopt best practices to prevent microplastic leakage.

i. For example, certain medical applications and other critical use cases.

CALL TO ACTION



DELIVERING AN EFFECTIVE TREATY

The negotiation of a new treaty on plastic pollution provides a unique opportunity to unlock systemic change across the global plastics economy by holding states to common, high-impact measures.

A well-structured and ambitious treaty will have many beneficial impacts. Besides protecting the environment, it will significantly reduce plastic pollution lifetime societal costs to the economy. The estimated lifetime societal costs of plastics produced in 2019 alone are \$3.7 trillion, and this number is set to increase every year to \$7.1 trillion for plastics produced in 2040. It will also reduce risks to public health. Incineration, open burning and plastic litter increase the risk of disease; and ingestion of microplastics by humans is linked to a range of potential health issues.

The treaty will be negotiated over five Intergovernmental Negotiating Committee (INC) meetings before the end of 2024. Due to the unique and critical nature of the treaty, WWF is calling on all stakeholders to ensure that we act decisively.

**LIFETIME SOCIETAL
COSTS OF PLASTICS
WILL INCREASE**

~2X

**IN COMING
TWO DECADES**

GOVERNMENT NEGOTIATORS MUST:

- 1) Adopt global rules** as the foundation for an effective treaty that goes beyond voluntary national actions and country-driven approaches.
- 2) Prioritize single-use plastics, fishing gear, and microplastics**, which together account for practically all plastic leakage.
- 3) Implement the most effective control measures per category** to reduce production of problematic plastics, mandate standards to enable circulation, and improve waste management.

Businesses must support the negotiation process by publicly advocating for an ambitious and effective treaty which will deliver global rules across the critical levers for reduction, circulation, and management. To support these advocacy efforts, companies from across the plastics value chain are invited to join the [Business Coalition for a Global Plastics Treaty](#) convened by WWF and the Ellen MacArthur Foundation.

As outlined in this report, negotiators must develop strong global rules on high-impact measures that address the most leakage-prone and harmful plastics. The scale of the problem and the breadth of public and business support for a decisive treaty demand no less. This is our chance to act.

INTRODUCTION

A ONCE-IN-A-GENERATION OPPORTUNITY TO SHAPE A MORE SUSTAINABLE PLASTICS FUTURE

Plastic pollution is an escalating environmental, economic, and social crisis. Since 1950, 75% of all plastic produced has become waste,¹ most of which ends up being discarded into the environment, including the ocean. This has a significant impact on wildlife, with nearly 90% of species assessed affected by plastic marine debris through entanglement and/or ingestion². Evidence indicates it also amplifies climate change, as the accumulation of plastic waste into the ocean limits oceans' carbon absorption capacity.³ Moreover, incineration and open burning of plastic waste release pollution into the air and soil, and plastic litter can block waterways and drains, causing flooding and increasing the risk of disease.⁴ Estimated lifetime societal costs of plastics produced in 2019 are at least ~\$3.7 trillion: more than India's GDP and equivalent to ~60% of global spending on education in 2019.⁵ This number is set to increase every year, with the lifetime societal costs of plastics produced in 2040 estimated at \$7.1 trillion.⁶ The global scope and urgency of the problem require decisive global actions to address the multitude of system failures across country boundaries and the global value chain.

In March 2022, UN member states, through the adoption of UNEA Resolution 5/14, agreed to convene an intergovernmental negotiating committee (INC) to develop an international legally binding instrument on plastic pollution, including in the marine environment.⁷ This officially set in motion the negotiation process, which is expected to finish by the end of 2024. The mandate, as laid out in the resolution, specifies that the new treaty on plastic pollution needs to cover the full plastics value chain, apply circular economy approaches, and tackle plastic pollution in marine and other environments. The historic decision, following years of advocacy and campaigning by different sectors and stakeholders, provides an opportunity to establish comprehensive global measures – under binding obligations for all states' parties – to unlock systemic change across the global plastics value chain.

The critical negotiation period starts now. If no action is taken, the annual flow of plastic into the ocean is expected to triple by 2040.⁸ Even in these two years of negotiation, the total amount of plastic pollution in the ocean is forecast to increase by 15%, or ~35 Mt (million metric tons),⁹ equivalent to 6 trillion plastic bags entering the oceans during deliberations. A decisive treaty is needed that will change the trajectory of this global crisis.

Recognizing that many aspects of the treaty will be under consideration during the negotiation process, this report makes three contributions by outlining: global rules as the foundation for an effective treaty; the need to prioritize the most problematic categories of plastic; and the specific policy levers that will be most impactful.

75% OF PLASTIC EVER PRODUCED IS NOW WASTE

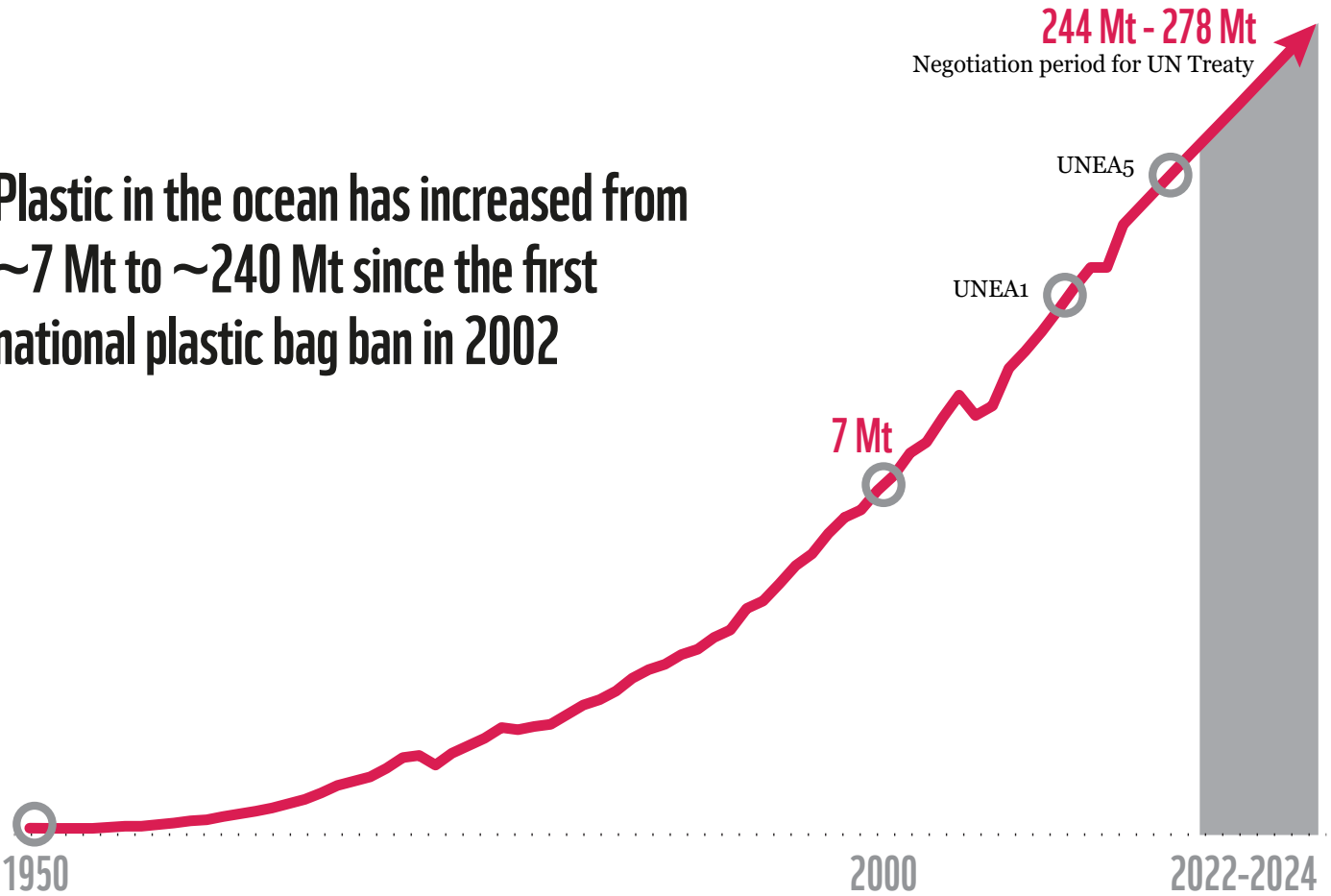
90% OF MARINE SPECIES ARE AFFECTED

\$3.7T LIFETIME SOCIETAL COST OF PLASTIC PRODUCED IN 2019

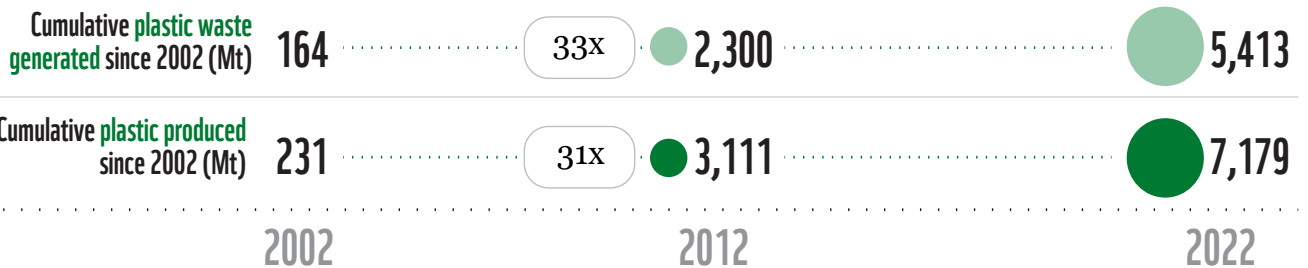
2040
LIFETIME SOCIETAL COST OF PLASTIC WOULD BE **\$7.1T**

PLASTIC INFLOW INTO THE OCEAN WOULD BE **3X** CURRENT RATES

Plastic in the ocean has increased from ~7 Mt to ~240 Mt since the first national plastic bag ban in 2002



Forecasts extrapolated from Geyer et al. (2019) and PEW and SYSTEMIQ (2020)



Forecasts extrapolated from Geyer et al. (2019) and PEW and SYSTEMIQ (2020)

APPROACH

GLOBAL RULES ARE ESSENTIAL TO UNLOCK SYSTEMIC CHANGE AT THE REQUIRED SPEED AND SCALE

Plastic pollution is a global problem with transboundary causes and effects, and must be addressed through a global, harmonized response. While UNEA Resolution 5/14 provides for the development of a legally binding instrument with both binding and voluntary approaches, an effective treaty requires a primary focus on global rules applicable across the global plastics value chain.

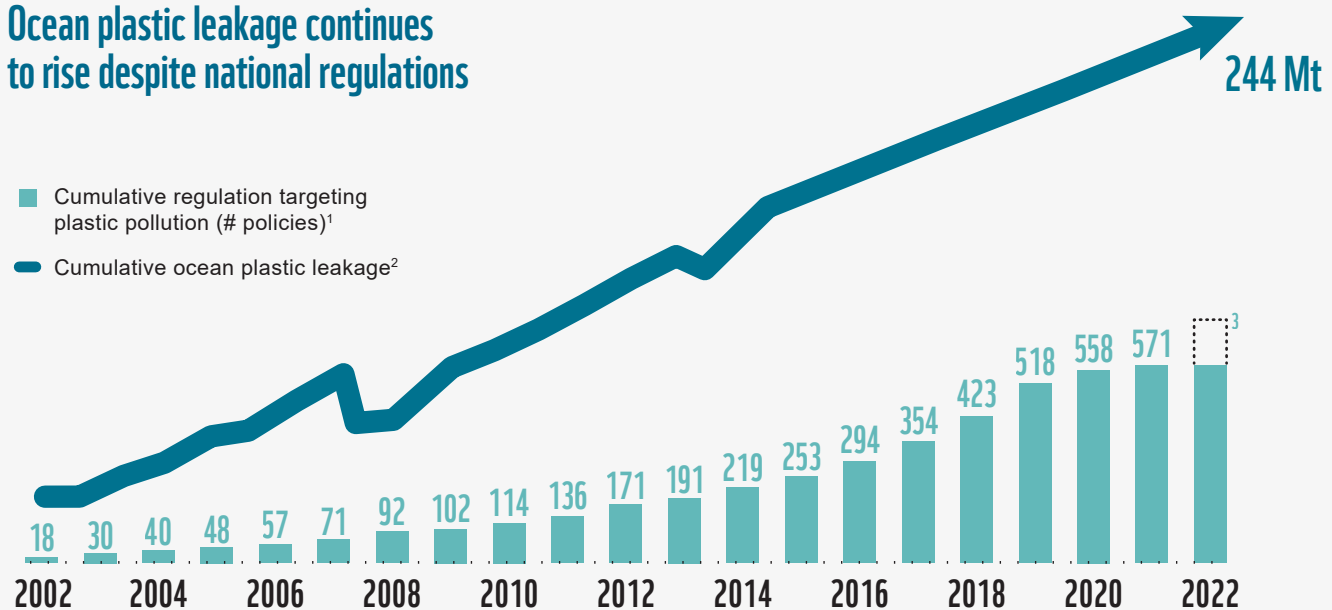
COMMON GLOBAL RULES WILL HAVE GREATER IMPACT THAN OTHER APPROACHES

National plans and strategies could be useful for designing complementary, context-specific measures, and to implement global rules in local contexts. However, history demonstrates that they do not deliver by themselves on a global, transboundary problem such as plastic pollution.

Efforts over the past three decades have demonstrated that we cannot rely on voluntary, country-driven action alone to end plastic pollution.

National and subnational policies targeting plastic pollution have been deployed over many years, with the first ban of a single-use plastic bag enacted in Bangladesh two decades ago. Since then, policies to manage plastic pollution have been introduced in more than 125 countries.¹⁰ Over the past five years, cumulative national regulation has grown by 60%.¹¹ Beyond these regulations, the private sector has launched further voluntary initiatives, including the New Plastics Economy Global Commitment with ~250 companies setting ambitious plastic targets over the last five years.¹² However, these voluntary actions have not been sufficient. In fact, since the above efforts have been underway, plastic pollution in the ocean has increased by >70 Mt.¹³

Ocean plastic leakage continues to rise despite national regulations



1. Nicholas Institute for Energy, Environment and Sustainability, Duke University, plastics policy inventory; 2. Forecasts extrapolated from Geyer et al. (2019) and PEW and SYSTEMIQ (2020); 3. Incomplete year, total expected to increase

Global rules are an established and effective approach to address product-specific environmental challenges. Common policy measures – implemented by all parties in their national legislation – have underpinned efforts to eliminate products of concern from the economy and therefore the environment in several cases comparable to plastic pollution. Examples include the Montreal Protocol on ozone-depleting substances (1987), the Stockholm Convention on persistent organic pollutants (POPs) (2004), and the Minamata Convention on mercury pollution (2017). These agreements have been recognized for their successful impact, with a 98% reduction in ozone-depleting substances resulting in clear signs of ozone layer recovery,¹⁴ a reduction in POP concentrations – even for more recently added chemicals,¹⁵ and a phase-out of mercury in products and processes.¹⁶

Indeed, it is hard to imagine the Montreal Protocol, for example, achieving the same environmental impact if it were based on a set of voluntary national actions. Not least its similar start point to plastics, with a heterogeneous mix of national regulations that spanned warning labels on aerosol spray cans in the Netherlands to bans on nonessential CFC (chlorofluorocarbon) containing aerosols in the US.¹⁷

The treaty must move beyond the fragmented actions of voluntary national plans to date. Many of the regulatory interventions needed to tackle plastic pollution will have to be tailored to regional, national, or local contexts. However, the unique potential of any global treaty is its ability to move beyond a collection of fragmented national plans and hold all states' parties to a high common standard of action. Structuring the treaty solely around voluntary national action would in essence be an extension of the existing unsuccessful approach. To the extent possible, negotiators must therefore develop comprehensive and ambitious global rules.

COMMON GLOBAL RULES WILL HAVE FASTER IMPACT THAN OTHER APPROACHES

Plastic pollution is growing at an exponential scale (>13 Mt/year), from an already large base (>200 Mt of ocean plastic pollution).¹⁸ Once in the ocean, the cost of removing plastic (estimated at \$124/Mt¹⁹ to \$25,000/Mt²⁰) is significantly higher than preventive mitigation approaches (estimated at a net benefit of \$2,241/Mt to a net cost of \$1,945/Mt).²¹ Furthermore, capabilities for large-scale removal currently do not exist. Since 1986, the Ocean Conservancy has removed ~0.16 Mt;²² and the Ocean Cleanup Project has removed 0.0001 Mt since August 2021.²³ Therefore, governments cannot afford delay in action or weak, pacifying treaty texts that focus on national actions alone and negate the essence of binding global solutions and control measures, especially as these approaches have already proved inadequate to date.

Decisive global rules offer the best prospect for rapid and systemic impact.

All countries acting in concert (to stop producing certain problematic plastics and to unlock a circular economy at a global scale) will have an immediate global impact, in contrast to waiting on a range of voluntary and often disparate actions taken at a national level – if they are taken at all. The speed with which global rules can have an impact is demonstrated by the success of the Montreal Protocol, which applied binding, time-bound, and measurable obligations.

A TREATY'S UNIQUE POTENTIAL IS TO HOLD PARTIES TO A HIGH COMMON STANDARD OF ACTION

GOVERNMENTS CANNOT AFFORD DELAYS OR PACIFYING TREATY TEXTS

GLOBAL RULES OFFER BENEFITS AND OPPORTUNITIES FOR BUSINESSES

HETEROGENOUS REGULATION IS COMPLEX AND COSTLY

The current plastic regulatory landscape is heterogeneous between and within countries, and is increasingly complex and costly for companies to navigate. This complexity brings two primary cost drivers: operational costs and compliance costs. On the operational side, the heterogeneity of regulations (including product and packaging standards) increases supply chain complexity and therefore cost, while the changing regulatory requirements add significant operational cost with each change. On the compliance side, companies must increasingly invest in compliance teams to scan for new regulatory changes, pay legal fees to help manage changes, and at times financial penalties. Indeed, a senior director at a major bottling company observed that “compliance costs for the patchwork of plastic regulations have increased six times in ten years.”²⁴ Global rules, with harmonized, common obligations and standards, offer the opportunity to reset this operating environment, while a treaty which is anchored on country-by-country actions may, if anything, exacerbate these costly trends.

Global rules will accelerate innovation by providing policy certainty, reducing risk, and concentrating efforts on common global priorities (preventing duplication and misalignment). For example, after the introduction of the Montreal Protocol, leading CFC manufacturers successfully developed substitutes much earlier than expected, resulting in business implementation costs 1.4–2.5 times lower than estimates – with costs in specific cases being up to 125 times lower.²⁵

Global rules will also create a level playing field across the plastics value chain, and benefit businesses complying with regulation and successfully implementing measures. A public affairs manager at a large consumer goods firm explained: “It’s about creating a level playing field. A fair distribution of responsibilities across our own supply chain – which runs through many different countries – is required for us to be able to have our desired impact.”²⁶

GLOBAL RULES OFFER BENEFITS TO GOVERNMENTS, ESPECIALLY IN DEVELOPING ECONOMIES

JOINTLY DEVELOPED SOLUTIONS COME AT LOWER AGGREGATE COSTS

Beyond opportunities in the private sector, there are appealing cost-saving opportunities in the public sector. Global rules would provide clarity and reduce implementation costs, such as lobbying, administrative fees, developing complex monitoring and reporting mechanisms, reconciling legislation, and monitoring with other countries. Moreover, governments would also benefit from economies of scale and the ability to roll out more effective plastic waste collection and management infrastructure.

The aggregate cost for every country to individually develop their own solutions – such as product design standards, definitions, lists of restricted additives or accepted polymers, and waste management standards – would be significantly higher than if these activities were undertaken jointly.

Furthermore, the level playing field across the plastics value chain applies to governments too. When regulations such as prohibiting the use of certain harmful additives or banning certain single-use plastic products are applied as common global rules rather than between and within countries, countries do not face the risk of investors or businesses moving their operations elsewhere.



Also, global rules offer critical support for middle- and low-income countries by improving control over plastics entering circulation and streamlining waste management needs. Many low-income countries, or countries with little to no domestic plastic production, are mostly on the receiving end of plastic products and – often – waste. They often have limited control over the production and design of plastic that enters their markets, leaving costly waste management infrastructure as their only choice to avoid plastic leakage.ⁱⁱ In low- and middle-income countries, waste management can be up to 20% of city budgets (versus 4% for high-income countries).²⁷ Negotiation on global rules that include sustainable upstream solutions for plastic would improve control over plastics entering their economies, reducing the burden of domestic waste management.

ii. Besides undesirable non-tariff barriers to trade and market-access restrictions, which would require countries to develop their own alternatives to plastic products and the many other essential consumer goods that come in plastic packaging.

PRIORITIES

THE TREATY MUST PRIORITIZE THREE TYPES OF PLASTIC: SINGLE-USE PLASTICS, FISHING GEAR, AND MICROPLASTICS

To be effective, the treaty must prioritize the most polluting plastics. Some plastic products are more prone to leakage and more harmful as pollutants than others. While comprehensive plastic pollution data does not exist, ocean plastic pollution data can be a useful indicator for total plastic leakage into the environment. The best available data are from coastal cleanups and recent research on marine pollution. These indicate that **single-use plastics, fishing gear, and microplastics** account for practically all ocean plastic pollution.²⁸

Single-use plastics is the largest ocean plastic pollution category by weight, representing 70% of plastic pollution found in coastal cleanups.²⁹ Single-use plastics include items that are intended to be used only once before being discarded, such as plastic carrier bags, bottles, food packaging, cups, straws, and cutlery. They account for more than half of all plastic that is produced.³⁰



Single-use plastics

A single-use plastic is a product that is made wholly or partly from plastic and that is not conceived, designed or placed on the market to accomplish, within its life span, multiple trips or rotations by being returned to a producer for refill or reused for the same purpose for which it was conceived.³¹



These plastics pose a significant obstacle to ending plastic pollution for two principal reasons:

Firstly, their single-use pattern has led to an exponential increase in volumes and rapid accumulation of waste.

Every minute, the world uses ~10 million plastic bags and purchases ~1 million plastic bottles.³² A plastic bag is typically used for 12 minutes and takes up to 1,000 years to decompose; plastic bottles are mostly discarded after consumers finish their drink.³³ If consumption of single-use plastics continues to increase, the situation will further deteriorate as waste management systems are unable to scale sufficiently to address growing waste generation.

Secondly, while efforts to increase global recycling are underway,³⁴ recyclability of many single-use plastics is limited.

Almost 25% of single-use plastics are multimaterial/multilayer plastics, and this number is growing.³⁵ These plastics are difficult and costly to separate into their component parts, which prevents widespread recycling at scale. A further 45% are flexible monomaterials, which have low recycling rates due to difficulties in the collection and sorting phases of waste management.³⁶ As a result, residual values are prohibitively low, meaning there is little incentive to collect them or prevent leakage.

Mirroring the EU's directive on single-use plastics,³⁷ the treaty should target those specific (sub-) categories of single-use plastics most frequently found in oceans and the environment. For example, cigarette butts, plastic beverage bottles and caps, food wrappers, plastic grocery bags and other plastic bags, plastic lids, straws and stirrers, and foam take-away containers are often found in international coastal cleanups.³⁸

Fishing gear

Abandoned, lost, or otherwise discarded fishing gear (ALDFG) includes all items related to the fishing industry and aquaculture, such as nets, lines, traps, and ropes. It is found in coastal areas, and is the most prominent source of plastic pollution in oceanic gyres. It is the deadliest form of plastic pollution for wildlife.

Fishing gear is most prominent in oceanic gyres, and is the deadliest form of plastic pollution for wildlife.

Annual leakage estimates range from 0.5 Mt³⁹ to over 1 Mt.⁴⁰ While the proportion of fishing gear found in coastal cleanups is ~10%, it constitutes an estimated 80% of the Great Pacific Garbage Patch.⁴¹ Once abandoned, lost, or discarded, the fishing gear continues to fulfill the purpose for which it was designed – to capture and kill – for many years afterwards.⁴² Animals that get caught or entangled die needlessly,⁴³ and valuable marine habitats are damaged.⁴⁴

The risk of leakage varies between categories of fishing gear: an estimated 5.7% of all fishing nets, 8.6% of traps and pots, and 29% of all fishing lines used globally are abandoned, lost, or discarded.⁴⁵ Also, some are more damaging than others: gillnets, pots and traps, and fish-aggregating devices were ranked as the top three harmful categories by the Global Ghost Gear Initiative.⁴⁶ The treaty should use existing research to target categories based on their risk of leakage and harmful impacts when leaked.





Microplastics

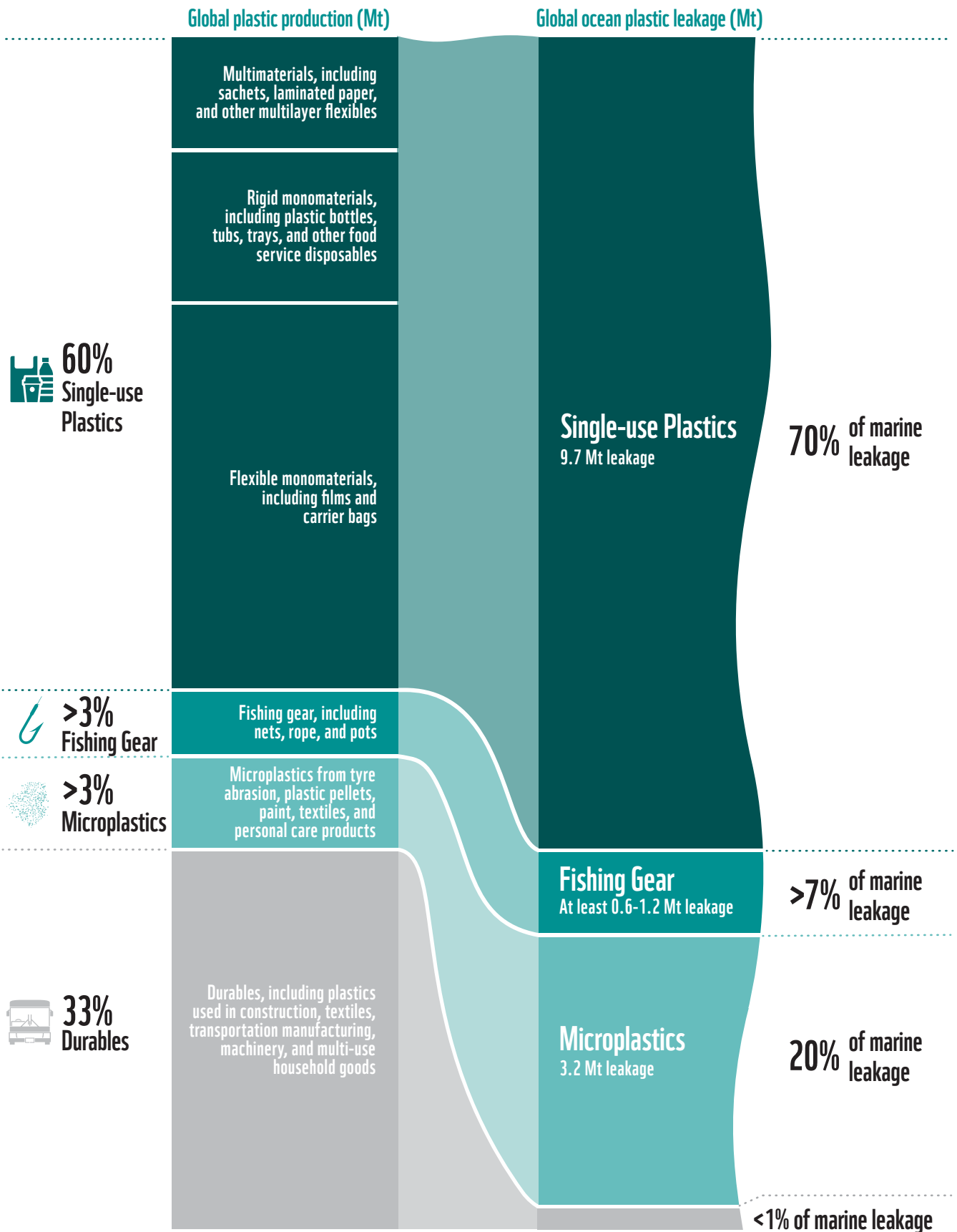
Microplastics represent an estimated 20% of all plastic entering the ocean each year but leak at six times the rate of single-use plastics, relative to production volumes.⁴⁷ Microplastics are defined as plastic particles less than 5 millimeters in diameter,⁴⁸ and can be classified as primary and secondary, depending on the source. Primary microplastics are produced or directly released into the environment as micro size particles. Examples include polymers from paints and microfibers from synthetic textiles. Secondary microplastics are tiny fragments resulting from degradation of larger plastic waste in the environment (including single-use plastics and fishing gear).^{49,iii}

Microplastics are particularly challenging to stop entering the environment, and impact marine and human health. An estimated 66% of microplastic ocean leakage is through road runoff, and a further 25% through suboptimal wastewater treatment.⁵⁰ The impact of microplastics on nature and human health is concerning. Marine microplastic debris can have a negative impact on the function and health of zooplankton – which are integral to the marine ecosystem regulation of carbon dioxide.⁵¹ Humans also ingest microplastics, for example through tap water, bottled water, and food. These may cause hormonal changes, acute and chronic toxicity, carcinogenicity (the tendency to develop cancer), and developmental toxicity (interference with fetal development).^{52,53}



iii. Microplastics from fertilizers excluded (in line with PEW and SYSTEMIQ, 2020) due to insufficient data.

THREE PRIORITY PLASTICS ACCOUNT FOR PRACTICALLY ALL MARINE LEAKAGE



Source: PEW and SYSTEMIQ, 2020; Note: Volume of plastic fishing gear production is indicative only given lack of reliable global estimates. Absolute volume of fishing gear 'leaked' follows previous WWF estimated ranges, while acknowledging some sources find significantly higher proportions of fishing gear in marine samples (~80% of the Great Pacific Garbage Patch, The Ocean Cleanup Project, 2022).

MEASURES

THE TREATY MUST START OUT WITH SPECIFIC, HIGH-IMPACT MEASURES TO REDUCE, CIRCULATE, AND BETTER MANAGE TARGETED PLASTICS

The most appropriate control measures to reduce plastic pollution will inevitably vary from one product category to another. The control measures in the treaty must therefore be tailor-made to each plastic category, based on the environmental impacts throughout their lifecycle. The treaty must apply a full lifecycle approach across the plastics value chain by tackling production (Reduce), reuse and recycling (Circulate), and end-of-life management (Manage). Measures available to policymakers can be clustered into these three main categories, here referred to as levers. All three levers are required in concert to have a meaningful impact, and there are important synergies between them.

The treaty should follow a hierarchical logic when determining which plastic products and polymers should be addressed by which levers. This hierarchy should start with Reduce as the default, followed by Circulate, with Manage as a limited measure for a few exceptions. Plastics could be classified into (sub-) categories in binding annexes – as was done for the Minamata Treaty and the Stockholm Convention – guided by existing recommendations from multi-stakeholder working groups and plastics pacts.



All three levers aim to minimize plastic leakage into the environment, by addressing different parts of the plastics value chain



1. REDUCE

Reduce production of problematic plastics to limit the inflow of harmful plastics into our economy.

These include harmful chemicals and additives, single-use plastic products that cannot be or are not recycled in practice, and microplastics – all of which have a very high likelihood of leaking into the environment. Reducing these products is essential to address plastic pollution as it directly impacts leakage rates by tackling problematic plastics at the source (a plastic not produced is a plastic not polluting), and is cost-effective, as it relieves the pressure to scale expensive end-of-life management.



2. CIRCULATE

Maximize circulation of plastic products to reduce both required inflow and leakage.

Single-use plastics are designed to be used once. Many are inherently incompatible with circularity due to their physical polymer structure and toxic chemicals and additives. However, they can last for thousands of years in the environment. Designing products to be recyclable, reusable, repairable, and durable (except for very specific circumstances, such as medical uses) ensures that plastics entering the economy are used multiple times, which reduces the need for new virgin plastics to meet plastic demand and reduces leakage into the environment of used products.



3. MANAGE


Safely manage exception plastics^{iv} to prevent leakage into the environment.

Uncollected and mismanaged plastic waste are major sources of plastic leakage into the ocean – indeed an estimated ~60% of leakage in 2016 came from uncollected waste.⁵⁴ Global rules to ensure improved waste management standards are important, but should be seen as a last option given that costs are often very high⁵⁵ (e.g., New York City spends ~\$3.2 billion annually on waste management⁵⁶). Moreover, implementation is difficult as it requires advanced infrastructure, and carries risk as it is the final opportunity to prevent plastic leaking into the environment, where it will be very difficult to remove.

Within these three levers to minimize leakage, the following specific measures should form the core of the global rules, designed for maximum impact and cost-effectiveness, and targeted towards specific plastics.

LEVER 1: REDUCE PROBLEMATIC PLASTIC PRODUCTS

All plastics or plastic products, unless they are demonstrably not problematic based on criteria agreed upon by parties to the treaty, should be phased-out or replaced by alternatives with reduced environmental impacts.

 **Phase-out, through an outright and immediate ban – reserved for the most harmful plastics – or through a planned time-bound reduction.**

RATIONALE

- **Global bans are effective.** For example, the Stockholm Convention banned or significantly limited the use of persistent organic pollutants. Since then, concentrations of several targeted pollutants have declined, with a total ban estimated to have a higher net present value than a partial ban, or a partial ban with additional voluntary measures.⁵⁷
- **There is strong support for bans, especially for single-use plastics.** In 2022, an estimated 75% of people worldwide want single-use plastics to be banned as soon as possible (up from 71% in 2019).⁵⁸
- **Global bans accelerate innovation and lead to faster availability of substitutes.** For example, after the Montreal Protocol banned many ozone-depleting substances, leading industry companies developed substitutes much earlier than expected. This led to 1.4–2.5 times lower costs than expected.⁵⁹
- **Time-bound reductions have a similar but delayed effect.** They provide slightly more time to adjust. However, this delay can be harmful given the cumulative nature of plastic pollution; therefore, immediate bans are preferable.

iv. For example, plastics involved in medical products or other use cases with an overwhelming need for plastics that cannot be recycled.

LEVER 2: MAXIMIZE CIRCULATION THROUGH REUSABLE AND RECYCLABLE PLASTICS

Provided problematic plastics are phased-out, all plastic products remaining in circulation should be subject to rules for reusability and recyclability.

 **Systems and product design standards** aimed towards reuse and recycling, achieved by:

- Mandating minimum recycled content inputs and reuse targets
- Restricting product color and shape choices to facilitate maximum recyclability and reusability, and to prevent littering
- Limiting the range of polymers available to use in certain products
- Requiring monomaterials be used in place of multimaterials wherever possible
- Eliminating toxic additives that make reuse dangerous for human health

RATIONALE

- **Harmonized product design standards enable reuse and recycling at scale.** Currently, post-consumer plastics are heterogeneous, often including 5%–15% foreign polymers and 5%–15% residue.⁶⁰ This makes them difficult to subsequently handle. Also, nearly half of waste collected for recycling is disposed of as residues because it cannot be properly processed, meaning only 9% of plastic waste is recycled worldwide.⁶¹ Standardized designs for bottles, for example, reduce the cost of closed-loop recycling by improving sorting, while increasing the amount of plastic material that is profitable to recycle (such as clear PET recyclate, which has a 25% higher sales value than other colors).⁶²
- **Increasing demand for recycled content fuels the secondary plastics market.** This increases the price of recycled inputs – attracting more suppliers – and unlocks increasing economies of scale in production and management of recycled plastics. Most importantly, it provides incentives for collection by boosting the residual value of plastic.

 **Harmonized product labeling and information disclosure obligations** that improve global transparency, clearly stating, for instance, the chemical contents of products.

RATIONALE

- **Improves global plastic allocation** by minimizing frictions that prevent matching plastic products to the appropriate next stage of the value chain. The right plastic waste more easily goes to the right processing facility to become the right input for the right producer during its next life cycle, creating a truly circular economy.
- **Enables effective policy implementation** by allowing legislators to make informed decisions on where best to allocate their resources to tackle pollution and which products to allow into their jurisdictions based on their own waste management capabilities.

LEVER 3: SAFELY MANAGE EXCEPTION AND LEGACY PLASTIC WASTE

Adhere to strict global standards for landfill operations, including preventing open dumping.

RATIONALE

- **Preventing open dumping addresses the majority of leakage.** Two-thirds of ocean plastic leakage derives from open dumping,⁶³ and 62% of the world's waste is disposed of in this way.⁶⁴ Total waste will decline once plastic production is reduced and circularity increased. Prohibiting open dumping will stimulate innovation and create economies of scale for more effective waste management solutions – which can be further supported through funding solutions.
- **Strict regulation of landfill can prevent further leakage.** Landfill represents one possible alternative for disposal of exempt plastics, but only when it is managed effectively; otherwise, leakage rates can remain high.⁶⁵ Disasters, including those likely to increase with climate change, can trigger significant plastic leakage into the environment, such as the Fox River dump disaster in New Zealand, or when Hurricane Harvey flooded 13 toxic waste sites in Texas.⁶⁶ Across Europe, there are 350,000–500,000 landfills, 90% of which predate modern waste control legislation,⁶⁷ while in the US, coastal Superfund sites storing toxic waste are at risk of being flooded.⁶⁸ Stricter regulation would mitigate these risks.

Provide the necessary support for scaling waste management infrastructure across the globe. The current disparity in collection rates between high-income and low-income countries is wide (96% vs. 39%, respectively⁶⁹), yet the technologies to close this gap are already available.

RATIONALE

- **Effective waste collection is a precondition for recycling, safely managing, and monitoring waste.** Current global recycling rates are only 9%, and the majority of ocean plastic leakage comes from uncollected sources.⁷⁰ For example, global rules on end-of-life management cost accountability would be an effective policy tool to improve collection.⁷¹
- **Improperly managed waste results in higher costs.** Subsequent down-stream costs are usually higher compared to the costs of managing waste properly in the first place.⁷²
- **Investing in global waste management infrastructure can help developing countries** make an impact faster and at lower cost.
- **Improving waste management brings benefits beyond plastics.** Uncollected waste in general poses a health hazard, whatever the material, while poorly managed waste can contribute to greenhouse gas emissions, health issues, and economic losses. These impacts often fall disproportionately on lower-income communities.⁷³

Mandate the appropriate marking of all fishing gear. Estimates of current fishing gear leakage range from 500,000 to over 1 million metric tons per year.⁷⁴

RATIONALE

- **Fishing gear is the deadliest form of marine debris.** This is a direct result of its original purpose to capture or kill.
- **Current efforts to address fishing gear require global scaling.** Efforts to trace fishing gear through tagging have been implemented within national jurisdictions – such as Taiwan – or as part of voluntary and fisher-led efforts to address ALDFG – for example, from FAO, UNEP, IMO, GGGI, and GESAMP.^{v,75} However, mandatory international standards are required to ensure global impact.

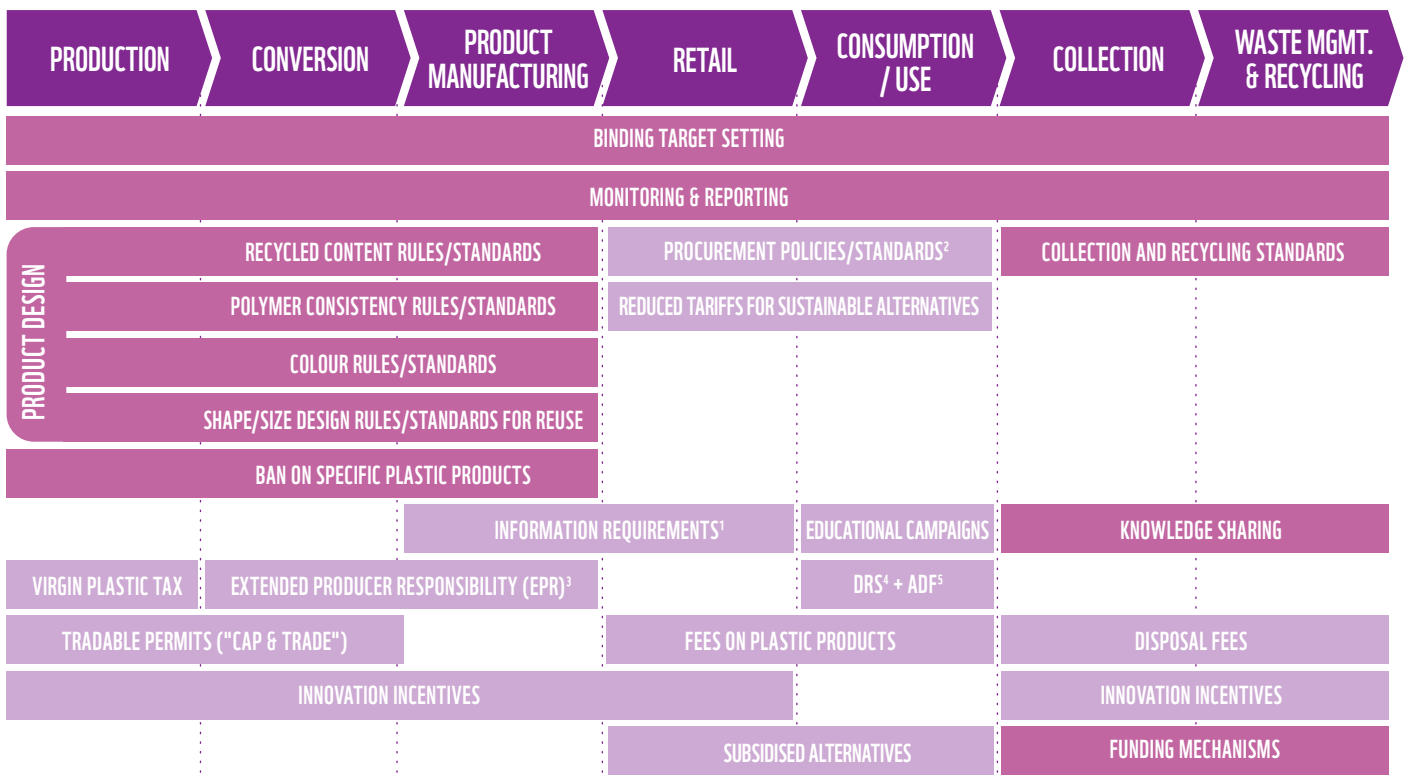
v. The Food and Agriculture Organization of the United Nations, United Nations Environment Program, International Maritime Organization, Global Ghost Gear Initiative, and the Group of Experts on the Scientific Aspects of Marine Environmental Protection.

 **Ensure the adoption of practices to prevent microplastic leakage, such as appropriate filters on washing machines, improvement of sewage plants, new tires avoiding abrasion, wastewater treatment, storm drains, best practices for transporting plastic production pellets, and addressing waste in a way that matches its content.**⁷⁶

RATIONALE 

- **Microplastics enter the environment at six times the rate of single-use plastics**, relative to production volumes, and can have different leakage pathways to macroplastics – and so require specific policy measures.⁷⁷
- **The adoption of best practices will prevent a significant proportion of this leakage.** Mandating the adoption of best practices to prevent microplastic leakage across the value chain will reduce leakage from these sources into marine environments.
- **Microplastics have already been linked to health problems in animals and humans.** They enter our food chain through absorption into the seabed and digestion by smaller marine animals,⁷⁸ and are linked to a range of potential human health issues.^{vi,79}

EXAMPLE POLICY MEASURES FOR PRIORITY PLASTICS ACROSS THE VALUE CHAIN

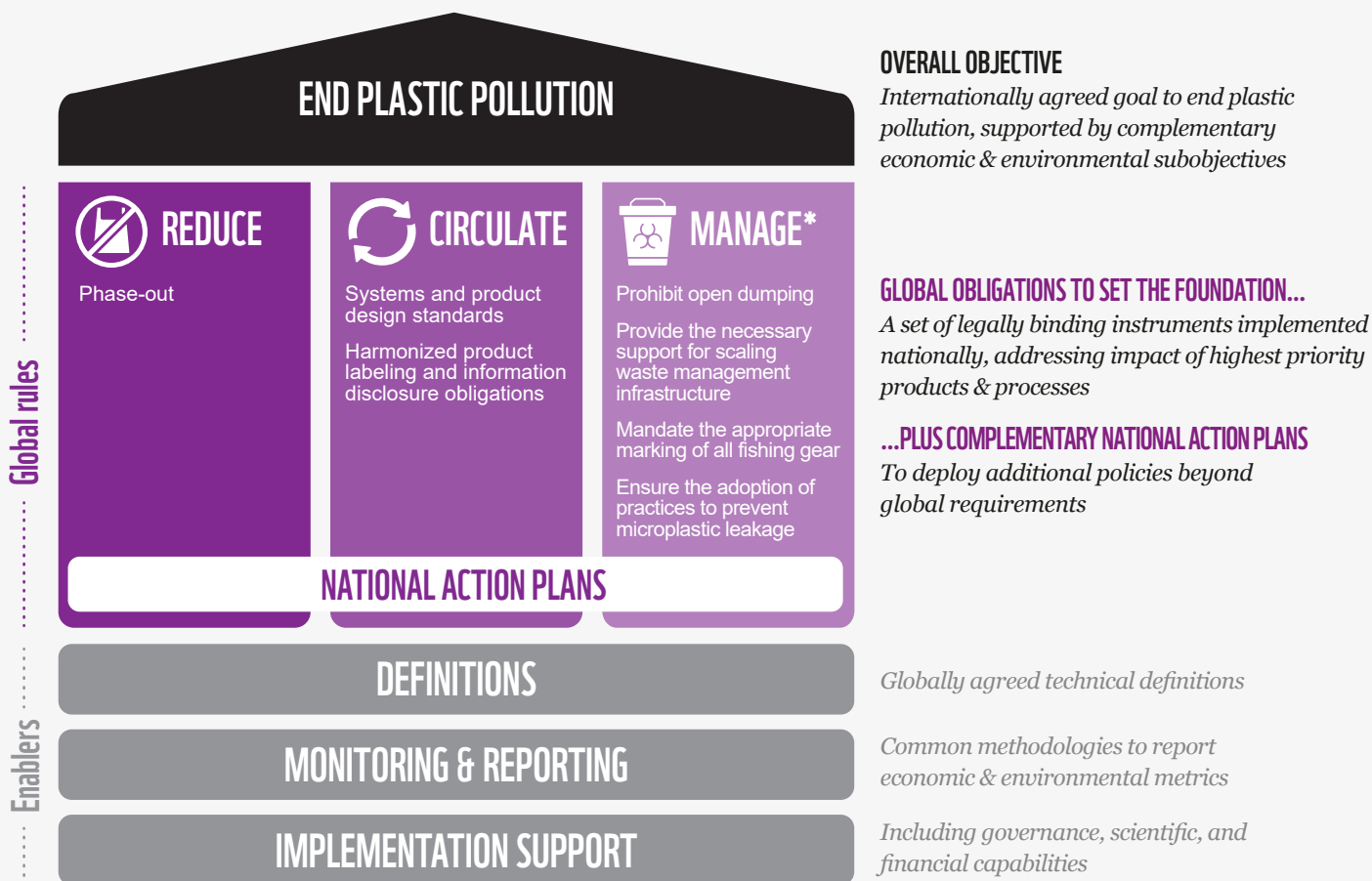


 Suitable for application of common global measures  Suitable for application of a combination of global and national measures

1. For example, the percentage of recycled content vs. virgin plastic content in a product, polymer types used in the plastic product, and recyclability level; 2. Large consumers such as government entities and large corporates could also be affected by procurement policies and standards; 3. EPR schemes may extend across the full value chain; 4. Deposit-refund systems; 5. Advanced disposal fees: product-based fees added at the point of sale. ADFs add end-of-life product management costs to the cost of the product, thereby internalizing costs that are often externalized to the environment. Unlike deposits, they are non-refundable to the consumer.

Note: Non-exhaustive list, targeted to single-use plastics. Specifics of the policies will likely vary by value chain step. Does not include waste trade policies.
vi. As outlined in section 2: hormonal changes, acute and chronic toxicity, carcinogenicity (the tendency to develop cancer), and developmental toxicity (interference with fetal development).

A LEGALLY BINDING TREATY BASED ON GLOBAL RULES, SUPPORTED BY NATIONAL ACTION PLANS AND ENABLERS



OVERALL OBJECTIVE

Any overarching and time-bound objective set by the treaty should reflect the urgency of the problem and provide businesses and other stakeholders with a common reference point to develop plans. This objective could be broken down into concrete and measurable subobjectives around reduction, circulation, and management.

NATIONAL ACTION PLANS

While global rules are critical to unlocking a step-change and setting the right foundations, countries will still be required to develop further policy measures to address context-specific drivers of plastic pollution. These national action plans should state which additional policies they plan to introduce, with quantified estimates of policy-specific impact on plastic leakage.

ENABLERS

Globally agreed definitions for key terms: The treaty on plastic pollution should include key definitions to support a harmonized legislative landscape, clearly defining plastic pollution drivers and the main policy levers under the treaty. These definitions should align with existing treaties (e.g., Basel Convention, Minamata Convention, Stockholm Convention) and leverage existing work done by multi-stakeholder coalitions (e.g., Plastic Pacts), NGOs (e.g., the Ellen MacArthur Foundation), and standard-setting bodies (e.g., ISO).

A streamlined monitoring and reporting system: A global baseline on plastic pollution, and an agreed methodology for tracking and reporting progress against that baseline, is required to enable tracking of key economic and environmental metrics, monitor progress against objectives and targets and identify potential for improvements. A range of methodologies is currently used in different geographies and at different scales, requiring standardization. Some economic measures such as plastic production, plastic trade, and plastic waste are already available and reported (e.g., World Bank Trends in Solid Waste Management,⁸⁰ UN Comtrade Database⁸¹), but broader, harmonized, and more granular coverage is required.

An institutional structure to support the effective implementation of the treaty: This will be particularly relevant to close the gap between high- income and low-/ mid-income countries, enabling access to the funding required to deploy appropriate infrastructure, technology, and capabilities. The treaty should deliver at least five elements to support effective implementation: a governance structure (conference of the parties), a scientific body, a secretariat, a financial mechanism, and a clearing house mechanism to facilitate knowledge sharing and technical cooperation.

*Transitional measures. In the long term, all unfit for purpose and problematic plastics will be removed from the system, and all plastic in circulation will be either safely reused or circulated (no disposal).

REFERENCES

1. World Bank Group, 'What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050' (2018), <https://openknowledge.worldbank.org/handle/10986/30317>
2. WWF, 'Impacts of plastic pollution in the oceans on marine species, biodiversity and ecosystems' (2021), https://wwfint.awsassets.panda.org/downloads/wwf_impacts_of_plastic_pollution_on_biodiversity.pdf
3. Sjollem et al., 'Do plastic particles affect microalgal photosynthesis and growth?' (2016), <https://doi.org/10.1016/j.aquatox.2015.12.002>
4. WWF, Ellen MacArthur Foundation, and BCG, 'The business case for a UN treaty on plastic pollution' (2020), <https://lp.panda.org/plastic-pollution-report>
5. WWF, 'Plastics: the costs to society, the environment and the economy' (2021), <https://media.wwf.no/assets/attachments/Plastics-the-cost-to-society-the-environment-and-the-economy-WWF-report.pdf>
6. WWF, 'Plastics: the costs to society, the environment and the economy' (2021), <https://media.wwf.no/assets/attachments/Plastics-the-cost-to-society-the-environment-and-the-economy-WWF-report.pdf>
7. UNEP (UNEA Resolution 5/14), 'End plastic pollution: Towards an international legally binding instrument' (2022), https://wedocs.unep.org/bitstream/handle/20.500.11822/39812/OEWG_PP_1_INF_1_UNEA%20resolution.pdf
8. PEW and SYSTEMIQ, 'Breaking the Plastic Wave' (2020), https://www.pewtrusts.org/-/media/assets/2020/10/breakingtheplasticwave_mainreport.pdf
9. Forecast extrapolated from Geyer et al., 'Production, use and fate of all plastics ever made' (2017), <https://doi.org/10.1126/sciadv.1700782>
10. UNEP, 'Legal limits on single-use plastics and microplastics' (2018), <https://www.unep.org/resources/report/legal-limits-single-use-plastics-and-microplastics>
11. Nicholas Institute for Energy, Environment and Sustainability, Duke University, '20 Years of Government Responses to the Global Plastic Pollution Problem; The Plastics Policy Inventory' (2020), <https://nicholasinstitute.duke.edu/publications/20-years-government-responses-global-plastic-pollution-problem>
12. Ellen MacArthur Foundation, 'Global Commitment', <https://ellenmacarthurfoundation.org/global-commitment/overview>
13. Forecast extrapolated from Geyer et al., 'Production, use and fate of all plastics ever made' (2017), <https://doi.org/10.1126/sciadv.1700782> and from PEW and SYSTEMIQ, 'Breaking the Plastic Wave' (2020), https://www.pewtrusts.org/-/media/assets/2020/10/breakingtheplasticwave_mainreport.pdf
14. UNEP, 'Thirty years on, what is the Montreal Protocol doing to protect the ozone?' (2019), <https://www.unep.org/news-and-stories/story/thirty-years-what-montreal-protocol-doing-protect-ozone>
15. Earth Negotiations Bulletin for the International Institute for Sustainable Development (IISD), 'Stockholm Convention on Persistent Organic Pollutants', <https://enb.iisd.org/negotiations/stockholm-convention-persistent-organic-pollutants>
16. UNEP, 'Minamata Convention on Mercury marks three years of protecting human health and the environment' (2020), <https://www.unep.org/news-and-stories/story/minamata-convention-mercury-marks-three-years-protecting-human-health-and>
17. WWF, Ellen MacArthur Foundation, and BCG, 'The business case for a UN treaty on plastic pollution' (2020), <https://lp.panda.org/plastic-pollution-report>
18. PEW and SYSTEMIQ, 'Breaking the Plastic Wave' (2020), https://www.pewtrusts.org/-/media/assets/2020/10/breakingtheplasticwave_mainreport.pdf
19. From PEW and SYSTEMIQ (2020): For beach litter clean-up in the United Kingdom, using € to US\$ exchange rate of 1.02 (data from 2010)
20. From PEW and SYSTEMIQ (2020): For derelict fishing gear in North-West Hawaiian Islands (data from 2007)
21. PEW and SYSTEMIQ, 'Breaking the Plastic Wave' (2020), https://www.pewtrusts.org/-/media/assets/2020/10/breakingtheplasticwave_mainreport.pdf
22. Ocean Conservancy, 'We clean on' (2021), https://oceanconservancy.org/wp-content/uploads/2021/09/2020-ICC-Report_Web_FINAL-0909.pdf
23. The Ocean Cleanup, 'First 100,000 kg removed from the Great Pacific Garbage Patch' (2022), <https://theoceancleanup.com/updates/first-100000-kg-removed-from-the-great-pacific-garbage-patch/#:~:text=Boyan%20Slat&text=Added%20to%20the%207%2C173%20kg,weight%20of%20a%20space%20shuttle!>
24. From interviews conducted in 2020 for our report, 'The business case for a UN treaty on plastic pollution' (2020) <https://lp.panda.org/plastic-pollution-report>

25. Institute for Environmental studies, 'Ex-post estimates of costs to business of EU environmental legislation' (2006), <https://core.ac.uk/download/pdf/17190704.pdf>
26. From interviews conducted in 2020 for our report, 'The business case for a UN treaty on plastic pollution' (2020) <https://lp.panda.org/plastic-pollution-report>
27. World Bank Group, 'What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050' (2018), <https://openknowledge.worldbank.org/handle/10986/30317>
28. PEW and SYSTEMIQ, 'Breaking the Plastic Wave' (2020), Figure 3, https://www.pewtrusts.org/-/media/assets/2020/10/breakingtheplasticwave_mainreport.pdf
29. PEW and SYSTEMIQ, 'Breaking the Plastic Wave' (2020), Figure 3, https://www.pewtrusts.org/-/media/assets/2020/10/breakingtheplasticwave_mainreport.pdf
30. PEW and SYSTEMIQ, 'Breaking the Plastic Wave' (2020), https://www.pewtrusts.org/-/media/assets/2020/10/breakingtheplasticwave_mainreport.pdf
31. European Parliament and European Council, 'Directive (EU) 2019/904 of the European Parliament and of the Council of 5 June 2019 on the Reduction of the Impact of Certain Plastic Products on the Environment' (2019), <https://eur-lex.europa.eu/eli/dir/2019/904/oj>
32. UNEP, 'Our planet is choking on plastic', <https://www.unep.org/interactives/beat-plastic-pollution/>
33. The World Counts, 'How many plastic bags are used each year?' (2022), <https://www.theworldcounts.com/challenges/planet-earth/waste/plastic-bags-used-per-year>
34. Ellen MacArthur Foundation and UNEP, 'Global Commitment and Circular Economy for Plastic Use', <https://ellenmacarthurfoundation.org/global-commitment/overview>
35. PEW and SYSTEMIQ, 'Breaking the Plastic Wave' (2020), https://www.pewtrusts.org/-/media/assets/2020/10/breakingtheplasticwave_mainreport.pdf
36. Hopewell et al., 'Plastics recycling: challenges and opportunities' (2009), <https://doi.org/10.1098%2Frsob.2008.0311>
37. Hugo, T.G. and Andresen, S., 'Towards a new treaty on plastic pollution: Assessing the relevance of the EU Directive on single-use plastics' (2021), <https://media.wwf.no/assets/attachments/Assessing-the-relevance-of-the-EU-directive-on-single-use-plastics.pdf>
38. UNEP, 'Single-use plastics, a roadmap for sustainability' (2018), <https://www.unep.org/resources/report/single-use-plastics-roadmap-sustainability>
39. WWF, 'Stop ghost gear: the most deadly form of marine plastic debris' (2020), https://files.worldwildlife.org/wwfcmssprod/files/Publication/file/3c1g4qur2t_ADVOCACY_REPORT_singles.pdf
40. PEW and SYSTEMIQ, 'Breaking the Plastic Wave' (2020), https://www.pewtrusts.org/-/media/assets/2020/10/breakingtheplasticwave_mainreport.pdf
41. The Ocean Cleanup, 'The Other Source: Where does plastic in the Great Pacific Garbage Patch really come from?' (2022), <https://youtu.be/CQnMjYlmNyQ>
42. PEW and SYSTEMIQ, 'Breaking the Plastic Wave' (2020), https://www.pewtrusts.org/-/media/assets/2020/10/breakingtheplasticwave_mainreport.pdf
43. University of Exeter, 'Hundreds of sharks and rays tangled in plastic' (2019), www.sciencedaily.com/releases/2019/07/190704191427.htm
44. Consoli et al., 'Marine litter from fishery activities in the Western Mediterranean Sea: The impact of entanglement on marine animal forests' (2019), <https://doi.org/10.1016/j.envpol.2019.03.072>
45. Richardson et al., 'Estimates of fishing gear loss rates at a global scale: A literature review and meta-analysis' (2019), <https://doi.org/10.1111/faf.12407>
46. Global Ghost Gear Initiative, 'Development of a best practice framework for the management of fishing gear Part 2: Best Practice Framework for the Management of Fishing Gear' (2016), https://pub-data.diver.orr.noaa.gov/marine-debris/northeast/GGGI_DFGBPF_Part1.pdf
47. PEW and SYSTEMIQ, 'Breaking the Plastic Wave' (2020), https://www.pewtrusts.org/-/media/assets/2020/10/breakingtheplasticwave_mainreport.pdf
48. OECD, 'Global Plastics Outlook: Economic drivers, environmental impacts and policy options' (2022), <https://doi.org/10.1787/de747aef-en>
49. Environmental Action, 'Plastic paints the environment' (2022), <https://www.e-a.earth/publications>
50. Boucher et al, at IUCN, 'Primary Microplastics in the Oceans' (2017), <https://portals.iucn.org/library/sites/library/files/documents/2017-002-En.pdf>
51. Cole et al. 'Microplastic Ingestion by Zooplankton' (2013), <https://pubs.acs.org/doi/10.1021/es400663f>
52. Yuan et al., 'Human health concerns regarding microplastics in the aquatic environment – From marine to food systems' (2022), <https://doi.org/10.1016/j.scitotenv.2022.153730>
53. UNEP, 'From Pollution to Solution: A global assessment of marine litter and plastic pollution' (2021), <https://www.unep.org/resources/pollution-solution-global-assessment-marine-litter-and-plastic-pollution>

54. PEW and SYSTEMIQ, 'Breaking the Plastic Wave' (2020), https://www.pewtrusts.org/-/media/assets/2020/10/breakingtheplasticwave_mainreport.pdf
55. World Bank Group, 'What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050' (2018), <https://openknowledge.worldbank.org/handle/10986/30317>
56. The Guardian, 'What does New York do with all its trash? One city's waste in numbers' (2016), <https://www.theguardian.com/cities/2016/oct/27/new-york-rubbish-all-that-trash-city-waste-in-numbers>
57. Marsden Jacob Associates, 'Plastic Bags Ban Options – Cost Benefit Analysis' (2016), https://s3.amazonaws.com/hdp.au.prod.app.vic-engage.files/1915/0580/1564/Plastic_Bags_Ban_Options_-_Cost_Benefit_Analysis_Report.pdf
58. IPSOS, 'Three quarters of people in global survey want single-use plastics banned' (2022), <https://www.ipsos.com/en-nl/attitudes-towards-single-use-plastics>
59. Institute for Environmental studies, 'Ex-post estimates of costs to business of EU environmental legislation' (2006), <https://core.ac.uk/download/pdf/17190704.pdf>
60. Lange at Shell, 'Managing Plastic Waste – Sorting, Recycling, Disposal, and Product Redesign' (2021), <https://pubs.acs.org/doi/10.1021/acssuschemeng.1c05013>
61. OECD, 'Plastic pollution is growing relentlessly as waste management and recycling fall short' (2022), <https://www.oecd.org/environment/plastic-pollution-is-growing-relentlessly-as-waste-management-and-recycling-fall-short.htm>
62. PEW and SYSTEMIQ, 'Breaking the Plastic Wave' (2020), https://www.pewtrusts.org/-/media/assets/2020/10/breakingtheplasticwave_mainreport.pdf
63. PEW and SYSTEMIQ, 'Breaking the Plastic Wave' (2020), https://www.pewtrusts.org/-/media/assets/2020/10/breakingtheplasticwave_mainreport.pdf
64. World Bank Group, 'What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050' (2018), <https://openknowledge.worldbank.org/handle/10986/30317>
65. PEW and SYSTEMIQ, 'Breaking the Plastic Wave' (2020), https://www.pewtrusts.org/-/media/assets/2020/10/breakingtheplasticwave_mainreport.pdf
66. The Guardian, 'Toxic waste revealed as eroding coastlines expose old landfills' (2022), <https://www.theguardian.com/environment/2022/mar/17/toxic-waste-revealed-as-eroding-coastlines-expose-old-landfills>
67. Nicholls et al., 'Coastal Landfills and Rising Sea Levels: A Challenge for the 21st Century' (2021), <https://www.frontiersin.org/articles/10.3389/fmars.2021.710342/full>
68. Carter et al., 'A Toxic Relationship: Extreme Coastal Flooding and Superfund Sites' (2020), <https://www.ucsusa.org/resources/toxic-relationship>
69. World Bank Group, 'What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050' (2018), <https://openknowledge.worldbank.org/handle/10986/30317>
70. OECD, 'Plastic pollution is growing relentlessly as waste management and recycling fall short' (2022), <https://www.oecd.org/environment/plastic-pollution-is-growing-relentlessly-as-waste-management-and-recycling-fall-short.htm>
71. Cowan and Tiller, 'What Shall We Do With a Sea of Plastics? A Systematic Literature Review on How to Pave the Road Toward a Global Comprehensive Plastic Governance Agreement' (2021), <https://www.frontiersin.org/articles/10.3389/fmars.2021.798534/full>
72. World Bank Group, 'What a Waste: A Global Review of Solid Waste Management' (2012), <https://www.ifc.org/wps/wcm/connect/106e528d-ad90-4ef9-9bc4-fddef4a5bb2c/What-A-Waste-Report.pdf?MOD=AJPERES&CVID=ldRsiqP>
73. World Bank Group, 'What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050' (2018), <https://openknowledge.worldbank.org/handle/10986/30317>
74. PEW and SYSTEMIQ, 'Breaking the Plastic Wave' (2020), https://www.pewtrusts.org/-/media/assets/2020/10/breakingtheplasticwave_mainreport.pdf
75. FAO, 'Responsible fishing practices for sustainable fisheries' (2022), <https://www.fao.org/responsible-fishing/resources/detail/en/c/1469916/>
76. PEW and SYSTEMIQ, 'Breaking the Plastic Wave' (2020), https://www.pewtrusts.org/-/media/assets/2020/10/breakingtheplasticwave_mainreport.pdf
77. World Bank Group, 'What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050' (2018), <https://openknowledge.worldbank.org/handle/10986/30317>
78. Cole et al. 'Microplastic Ingestion by Zooplankton' (2013), <https://pubs.acs.org/doi/10.1021/es400663f>
79. Yuan et al., 'Human health concerns regarding microplastics in the aquatic environment – From marine to food systems' (2022), <https://doi.org/10.1016/j.scitotenv.2022.153730>
80. World Bank Group, 'Trends in Solid Waste Management', https://datatopics.worldbank.org/what-a-waste/trends_in_solid_waste_management.html
81. United Nations, 'Comtrade Database', <https://comtrade.un.org/>

35M metric tons

Increase in plastic pollution entering the ocean during the proposed negotiation period for the plastic pollution treaty

33X

Growth in annual plastic waste generated over last two decades

GLOBAL RULES

Treaty needs to go beyond a continuation of unsuccessful voluntary national actions by establishing binding global rules

3 TARGET PLASTICS

Three types of plastic account for practically all marine leakage: single-use plastics, fishing gear, and microplastics

POLICY MEASURES

Prioritize efforts on reducing production of problematic plastics, mandating standards to enable circulation, and improving waste management



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