REPORT

environmental investigation agency

OCEAN

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# BENDING THE CURVE

## How global cooperation to reduce plastic production can help end the plastic crisis

## ACKNOWLEDGEMENTS

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## ABOUT EIA

The Environmental Investigation Agency (EIA) investigates and campaigns against environmental crime and abuse. Our undercover investigations expose transnational wildlife crime, with a focus on elephants, pangolins and tigers, and forest crimes such as illegal logging and deforestation for cash crops. We work to avert climate catastrophe by investigating the criminal trade in refrigerant gases, strengthening and enforcing regional and international agreements that tackle fossil fuels and climate super-pollutants, including ozone-depleting substances, hydrofluorocarbons and methane, and promoting sustainable cooling. We seek to safeguard global marine ecosystems by addressing the threats posed by plastic pollution, bycatch and commercial exploitation of whales, dolphins and porpoises.


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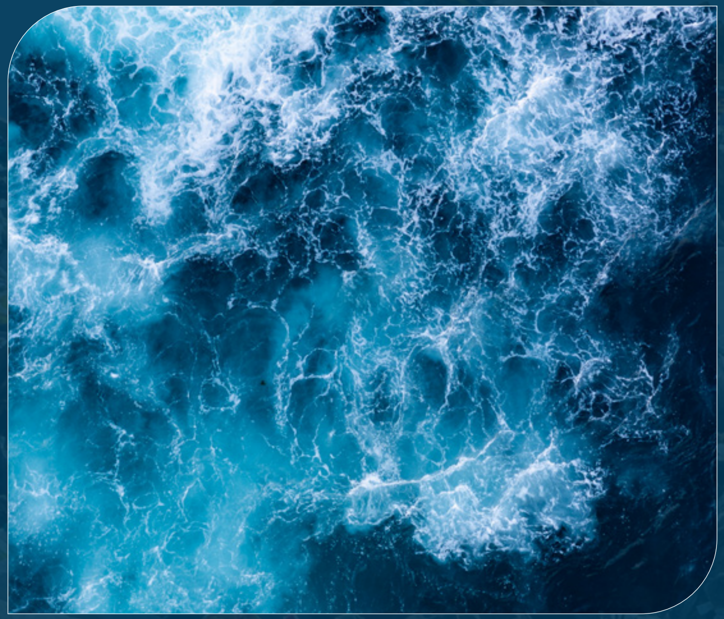

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# EXECUTIVE SUMMARY

## Negotiations towards an internationally legally binding instrument (ILBI) to end plastic pollution have increasingly centred on whether, and how, the treaty should address the continued growth of polymer production.

While the mandate spans the full lifecycle of plastics, production limits have emerged as one of the most contested issues in the process.

Against this backdrop, plastic production and consumption continue to rise at a pace that exceeds the planet's capacity to cope. If current trends continue, global plastic output is projected to reach approximately 766 million tonnes by 2040 – equivalent to producing more than 75 trillion standard plastic bottles each year or enough plastic to make more than 100 smartphones for every person globally annually.

This continued expansion drives parallel increases in plastic waste, environmental leakage and greenhouse gas emissions. Even where recycling and waste collection systems improve, they are increasingly outpaced by the sheer volume of plastic entering the system, underscoring the limits of downstream approaches and the relevance of production action within the treaty.

Using new modelling, this report explores what happens when countries curb plastic production and consumption – and what happens when they don't.

The analysis is grounded in the reality of the ongoing negotiations for a Global Plastics Treaty and looks at the emerging country groupings in that context to determine a set of real-world scenarios which could affect change in the global plastics economy. The scenarios move from a business-as-usual case with no new action by any country to a coalition of high-ambition countries acting together and on to an expanded coalition including China as a major global producer and, finally, to the most ambitious scenario in which China is joined by a group of middle countries whose positions in the negotiations remain undecided and could prove pivotal in determining whether production reductions are adopted into the treaty.

Delegates gather in contact groups to negotiate draft treaty text during INC 5.2.

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Across each of these pathways, the modelling also tests outcomes under both unrestricted and restricted global trade conditions, showing how the risk of production and consumption shifting across borders declines as participation broadens and ambition increases.

EIA's research found that under business-as-usual, global plastic production rises steeply to about 766 million tonnes by 2040, driving parallel growth in consumption, waste, pollution and emissions. Plastic waste generation increases to about 621 million tonnes per year, while mismanaged waste climbs to more than 110 million tonnes annually, overwhelming waste systems and accelerating environmental harm.

By contrast, scenarios which introduce upstream controls with progressively greater numbers of participants deliver dramatic improvements across the plastic economy. Even with only high-ambition country participation, global plastic production falls by 16-18 per cent below business-as-usual by 2040, with corresponding reductions in polymer use and waste generation.

When that same group of ambitious countries is joined by China, the impact increases dramatically. In this scenario, total global plastic production falls by approximately 38 per cent.

Additionally, in the most ambitious scenario, which includes middle countries such as Brazil, India and South Africa, production decreases by approximately 45 per cent, reducing it to around 420 million tonnes in 2040. Total plastic waste generation falls by nearly half, while mismanaged plastic waste declines by more than 50 per cent, dropping to about 50 million tonnes. Greenhouse gas (GHG) emissions decrease in parallel to 40.3 billion tonnes (Gt) carbon-dioxide equivalence ($CO_2e$).

Crucially, the results confirm that who participates matters because when only a small number of countries act, some production shifts elsewhere, but when ambition is combined with participation from a least one major producer, displacement shrinks sharply and global outcomes converge. The modelling demonstrates that a coalition of the willing, reinforced by major producers, can bend the global plastics curve without waiting for universal agreement.

The findings also confirm that downstream measures work best when upstream controls are in place. Recycling shares rise, waste systems cope better and pollution falls sharply, but only when the overall volume of plastic entering the system is reduced. Without limits on production and consumption, even the most advanced waste systems struggle to keep up.

The message for policymakers is clear. Ending plastic pollution is not about endlessly cleaning up after a growing plastics economy, it is about changing the rules so that production growth itself slows and shifts to sustainable alternatives and a genuine circular economy. A strong Global Plastics Treaty can set that baseline by embedding upstream controls on plastic production and consumption while still allowing countries to move faster and further through leadership, cooperation and action beyond the treaty text.

As this report shows, turning off the tap does not just make the system easier to manage – it makes real, lasting progress possible.

# INTRODUCTION

## Plastic has shown the highest growth in production among bulk materials over the past decade. The sector's trajectory remains exponential, with global output expected to double or even triple by 2050.[1]

Production and consumption continue to rise at a pace that exceeds the planet's capacity to manage the resulting waste. Although plastics now underpin nearly every sector of the global economy, the systems designed to manage them have not kept pace with this rapid expansion. More than half of all plastic ever manufactured has been produced since 2004, yet only about 14 per cent has been collected for recycling, with the remainder landfilled, incinerated or leaked into the environment.[2,3]

Consequently, plastic pollution has contaminated all ecosystems on Earth and has therefore emerged as a significant and escalating threat to natural ecosystems, human health and the climate.[1,4,5]

The climate implications of this growth are equally stark. Plastics remain overwhelmingly fossil fuel-based and their total lifecycle emissions are already estimated at 2.4 billion tonnes (Gt) carbon-dioxide equivalence ($CO_2e$) annually, with projections indicating an increase to nearly 3.9 Gt $CO_2e$ by 2050, even under conservative assumptions.[1,6] In a world rapidly exhausting its remaining carbon budget to limit global warming to 1.5°C, continued expansion of plastics production is incompatible with international climate commitments.

These concerns are now at the centre of global negotiations for a new internationally legally binding instrument (ILBI) to end plastic pollution under the UN Environment Assembly (UNEA) resolution 5/14. While the Intergovernmental Negotiating Committee (INC) negotiations have advanced significantly since 2022, one of the most consequential issues is whether and how to reduce primary plastic production. The volume of plastic produced ultimately dictates the effectiveness of all measures further downstream, in particular the scale of waste generation, pollution and emissions. Without effective upstream controls, waste systems cannot keep pace, and the potential for a non-toxic circular economy remains out of reach.[7,8]

Despite this, the negotiations on plastic production have been deeply polarised, with a majority of countries advancing proposals for a global reduction target and related national measures, reporting and effectiveness evaluation,[9,10] while a small minority of oil- and gas-producing countries adamantly oppose any advancement of substantive discussions.

To inform future discussion, this report represents new modelling of global plastic production and consumption across the core scenarios directly related to the emerging groupings of countries active in the INC process.[9,10]

Throughout the analysis, plastic production refers to total polymer production, including both primary (virgin) and secondary (recycled) polymers. The four scenarios are assessed as to whether they are accompanied by restrictions on trade, namely non-party trade provisions or the lack thereof, which are then applied consistently across all scenarios to capture the two boundaries of plausible system behaviour.

The first is an unrestricted global trade case, in which any production surpluses or shortfalls arising in participating countries are redistributed to non-participating countries through global trade, ensuring supply and demand balance at the global level. The second is a restricted group of cases in which participating and non-participating countries are treated as separate systems, with production and consumption required to balance within each group and no redistribution across groups. By combining four policy scenarios, with and without trade restrictions, the modelling explicitly tests how different levels of international cooperation affect outcomes in production and consumption, waste generation and climate emissions levels.

The modelling provides essential evidence for policymakers engaging in the plastic treaty negotiations and for governments considering national commitments. It quantifies the degree of production and consumption reduction needed to align with environmental and climate goals and identifies the degrees to which different coalitions could deliver meaningful global change. Although plastic provides important societal benefits, current production levels are incompatible with a safe and sustainable future.[11,12]

**Above:** Plastic production is already out of control, and is on course to potentially triple by 2050

# WHAT, WHERE, WHO AND HOW MUCH

*Data reveals a plastics economy defined by deep structural imbalances*

## Production is accelerating faster in regions with strong state-backed petrochemical expansion, while other regions face stagnation or decline. At the same time, consumption and waste pressure fall disproportionately on countries which play little role in fuelling global supply.

While recycled plastic feedstocks are expected to grow in the coming years, primary plastics continue to dominate the market, representing 88 per cent of the market share in projections out to 2060.[13] This reflects the continued dominance of virgin production even as recycling rates increase (Figure 1). In the modelling, growth in recycled feedstock remains constrained by underlying consumption patterns, the technical and logistical feasibility of recycling, product lifetimes and waste management systems.

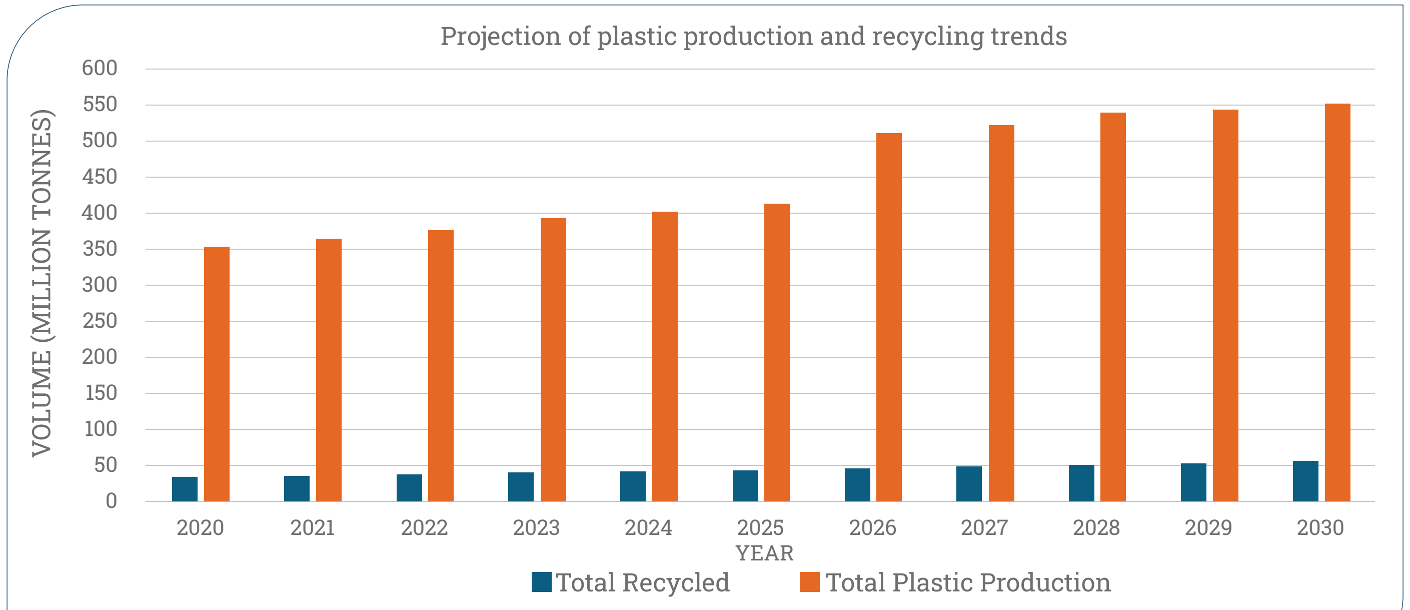
Accordingly, this section focuses on primary plastic production as trends in virgin supply remain the determinant of the total volume entering the plastic system and, therefore, of downstream waste generation, pollution and climate emissions.

Understanding the dynamics of what primary plastics are produced, where production is concentrated, who controls production capacity and how much material is circulating is essential.

**Above, left:** Whilst plastic pollution is a plague to the environment, the production process is a huge contributor to the climate crisis

**Above:** Primary plastic in pellet form, the raw polymer feedstock used to manufacture plastic products

***Figure 1:*** *Projection of global plastic production and recycling levels showing a widening gap between production growth and recycling rates through 2030. Recycling volumes reflect Organisation for Economic Co-operation and Development (OECD) estimates of secondary plastic use derived from recycling activity.* ***Source:*** *OECD Data*




**KEY TAKEAWAY**

PLASTIC PRODUCTION IS OUTPACING RECYCLING, WIDENING A GROWING GAP THAT WILL TRANSLATE DIRECTLY INTO HIGHER LEVELS OF WASTE UNLESS PRODUCTION IS CONSTRAINED

## WHAT IS BEING PRODUCED?

Despite the variety of plastic polymers on the market, this report focuses on standard plastic polymers – those used in everyday applications where specialised performance is not required – and which together account for about 90 per cent of global plastic demand.[14]

Standard plastics are distinct from so-called engineering or performance plastics, which generally have superior mechanical or thermal properties for low-volume applications or are designed specifically to withstand harsh conditions. Engineering and performance plastics represent approximately 10 per cent of the market share combined.[14,15,16]

Within the standard plastics category, global production is heavily concentrated in a small set of high-volume commodity polymers. Polypropylene (PP), polyethene (PE) and polyethene terephthalate (PET) form the core of the plastic economy, underpinning packaging, consumer goods and the fast-growing synthetic textile sector.[13]

The data reveal that PP production will rise from ~93.9 million tonnes in 2020 to ~169.2 million tonnes in 2030, while PET production will grow from ~14.9 million tonnes to ~26.1 million tonnes, driven primarily by demand for polyester fibres. PE also increases significantly, reaching ~4.6 million tonnes by 2030. These trends are illustrated in Figure 2, which shows steep decade-long growth across all major high-volume polymers.

Alongside these high-volume materials sits a distinct group of problematic polymers, including polyvinyl chloride (PVC), polystyrene (PS), polycarbonate (PC) and polyurethane (PU). Although also widely used, standard plastic polymers differ fundamentally in their environmental and health profiles. Problematic polymers rely more heavily on hazardous materials, generate toxic emissions during production and disposal and are significantly harder to recycle.[17,18]

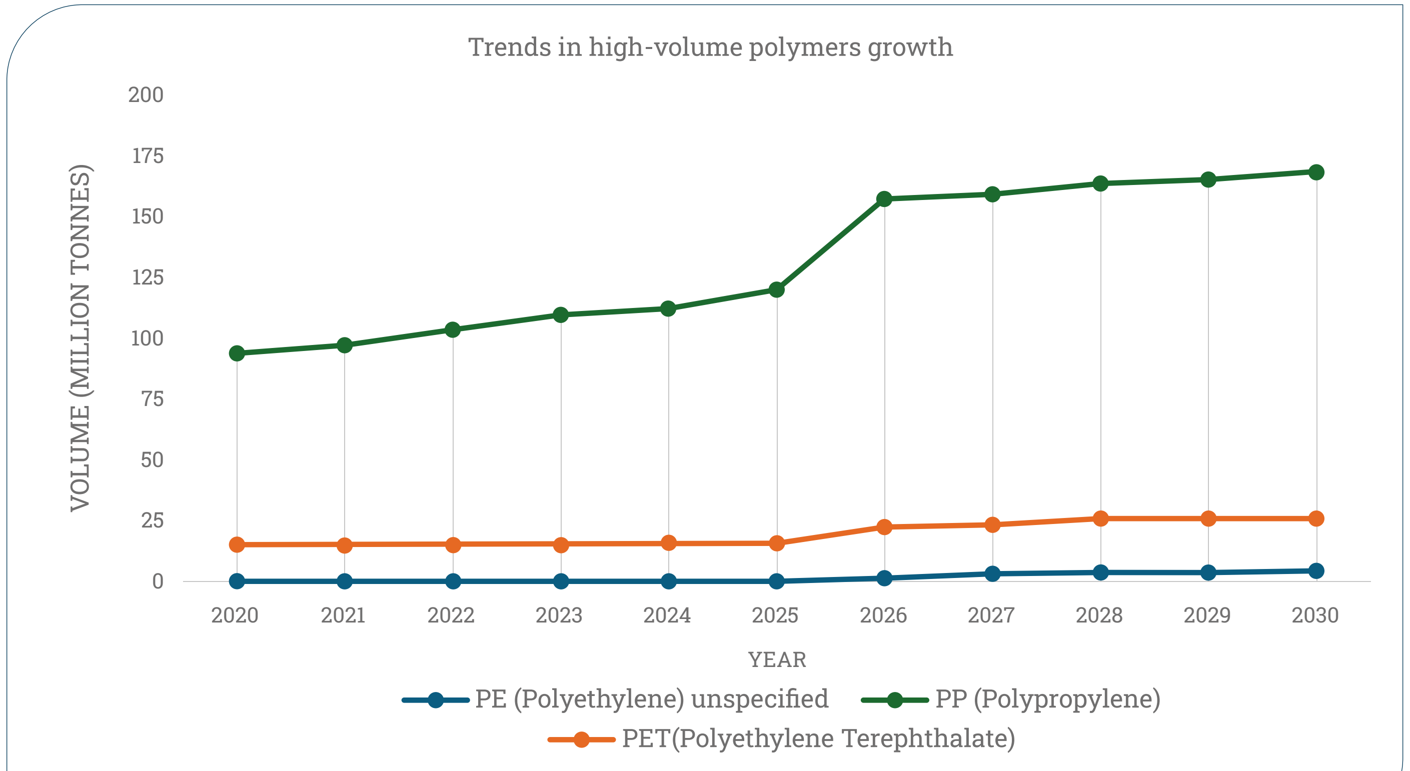
PVC alone reaches ~79.1 million tonnes in 2030, PS climbs to ~20.7 million tonnes, PU expands to ~204.9 million tonnes and PC rise steadily to ~ 11.9 million tonnes, surpassing some high-volume polymers in scale.

Their persistence reflects the widespread use of hazardous additives, limited recyclability and the absence of global controls on high-risk plastic categories. These patterns are shown in Figure 3, which highlights how problematic polymers continue to rise alongside commodity plastics.

Throughout the negotiations, member states have explored criteria and listings for a supply-side approach to ensure these problematic polymers, otherwise known as "the dirty quartet", are restricted or otherwise eliminated, with provisions provided in an annex for exemptions, as appropriate. Given the existence of these polymers undermines health, recycling and environmental goals, their use should be phased out over time.[19]

Together, the polymer profiles reveal a system driven by large-scale demand for conventional materials while remaining locked into hazardous, difficult-to-manage polymers that pose disproportionate risks. These dynamics underscore the need for upstream measures within any Global Plastic Treaty that follow both a criteria approach for problematic polymers and an approach for high-volume polymers subject to control more broadly.

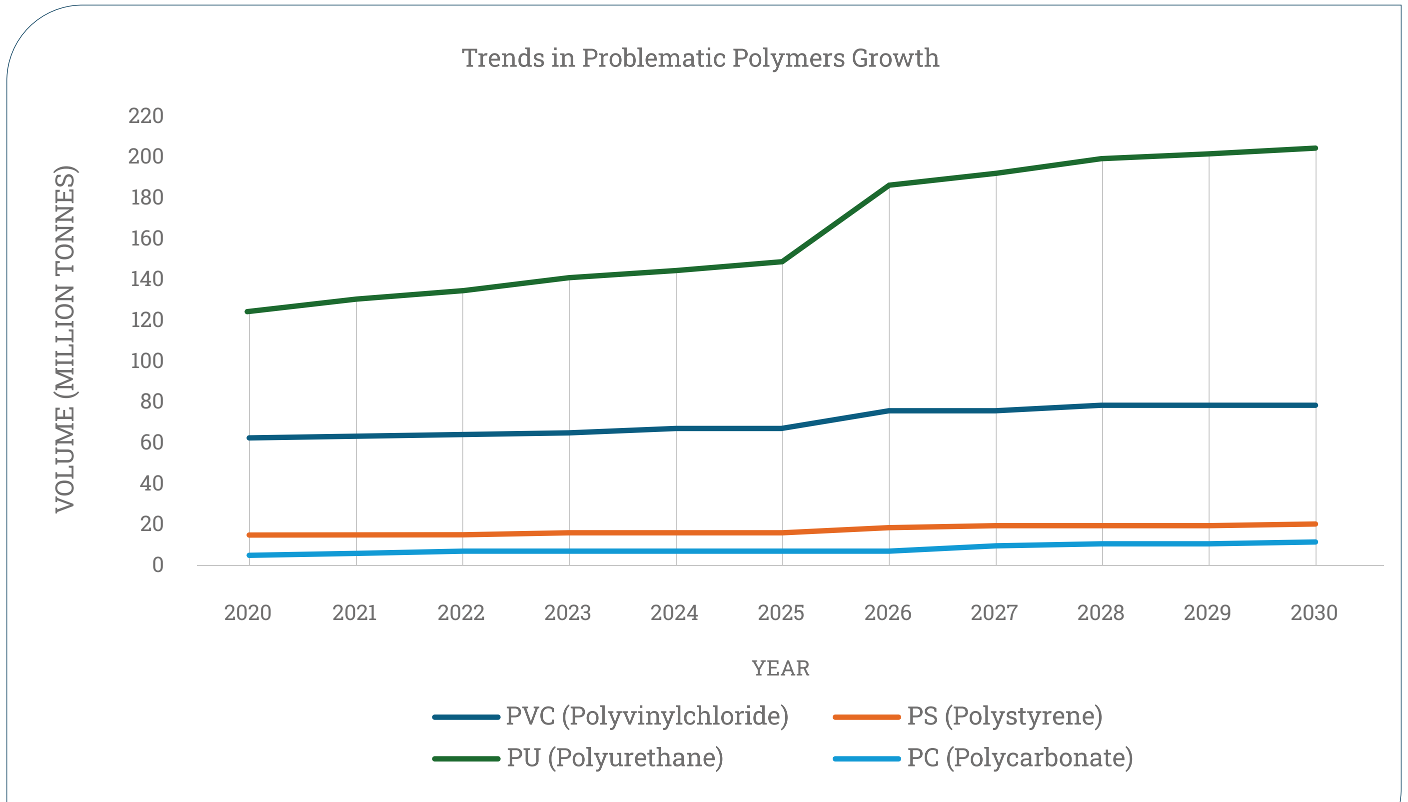
***Figure 2:*** *Graph showing projected growth scenario out to 2030 for high-volume polymers (PE, PET, PP).* ***Source:*** *Polyglobe*




**KEY TAKEAWAY**

GROWTH IN PLASTICS IS CONCENTRATED IN A SMALL NUMBER OF HIGH VOLUME POLYMERS, MEANING TARGETED ACTION ON THESE MATERIALS CAN UNLOCK DISPROPORTIONATE REDUCTIONS

***Figure 3:*** *Graph showing projected growth scenario out to 2030 for problematic polymers (PVC, PS, PU, PC)* ***Source:*** *Polyglobe*




**KEY TAKEAWAY**

PROBLEMATIC PLASTICS CONTINUE TO EXPAND ALONGSIDE OVERALL PRODUCTION, LOCKING IN POLLUTION RISKS UNLESS THESE MATERIALS ARE PHASED OUT

## WHERE IS PRODUCTION CONCENTRATED?

The geography of global plastic production has shifted decisively eastward, with the Asia-Pacific region now the dominant centre of global manufacturing, with regional output rising from 192 million tonnes in 2020 to approximately 344 million tonnes in 2030. This represents the largest regional increase worldwide and accounts for almost 60 per cent of global production by 2030.

China (36 per cent) drives much of this growth, but significant capacity expansion is also occurring in India (six per cent), South-East Asia and other emerging production hubs, supported by large petrochemical investments, as well as competitively priced feedstocks and fast-growing consumer markets (Figure 4).

Elsewhere, trends diverge. North America maintains a substantial but slow-growing production base, increasing from 56.6 million tonnes to about 68 million tonnes between 2020-30. Growth is driven primarily by privately owned multinational producers rather than state-backed expansion. South America, by contrast, shows only modest growth, from 12.3 million tonnes to 13.1 million tonnes (Figure 3). This is almost entirely attributable to Brazil's (two per cent) expanding petrochemical sector.

In Europe, polymer production rises from approximately 54 million tonnes in 2020 to about 77 million tonnes in 2030 (Figure 4). While this represents an increase of roughly 40 per cent over the decade, it does not signal a renewed expansionary trajectory. Compared with the much faster growth in Asia and the Middle East, Europe's increase remains modest and uneven, reflecting incremental recovery and optimisation rather than significant new capacity additions. As a result, despite modest absolute growth, Europe continues to lose global market share and is becoming increasingly reliant on imports from Asia and the Middle East.[20]

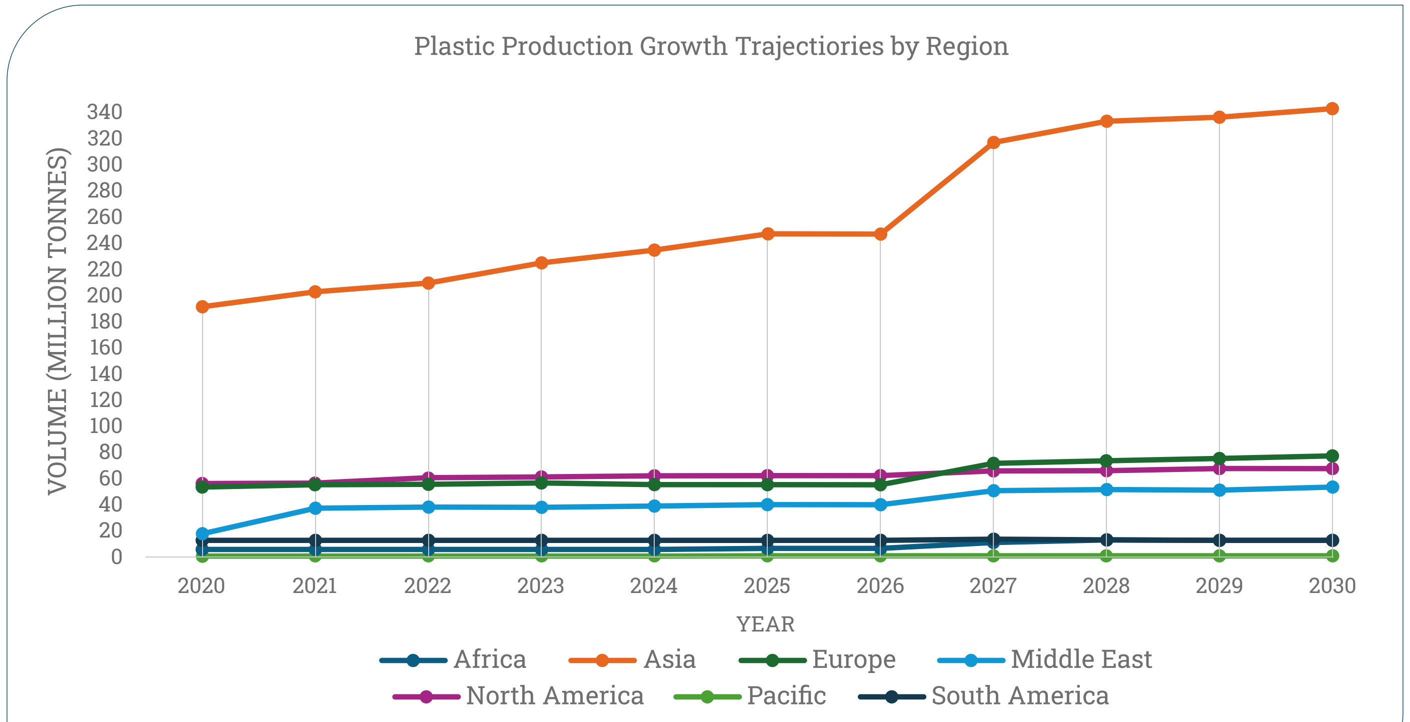
The Middle East, meanwhile, emerges as the fastest-growing region in relative terms. Production more than doubles over the decade, rising from about 18 million tonnes to more than 53 million tonnes, an increase of roughly 200 per cent. This rapid expansion is driven by export-oriented strategies, access to low-cost fossil feedstocks and continued public investment in large, integrated petrochemical complexes designed to serve markets in Africa, Asia and Europe.[21]

Africa, meanwhile, remains a minor producer in global terms. Total output stays below 13 million tonnes a year throughout the period. Although early capacity increases are visible in a small number of countries linked to oil and gas development, these additions remain limited in scale and do not materially alter Africa's position within the global plastic economy.

## WHO PRODUCES THE MOST?

Global plastic production is highly concentrated among a small group of countries and an even smaller circle of powerful petrochemical companies. Five countries – China, India, Russia, Saudi Arabia and the US – together account for well over 70 per cent of global primary polymer output.

***Figure 4:*** *Graph showing the projected growth scenario through 2030 for plastics production across global regions. Source: Polyglobe*




**KEY TAKEAWAY**

PLASTIC PRODUCTION GROWTH IS CONCENTRATED IN A HANDFUL OF REGIONS, PLACING RESPONSIBILITY FOR GLOBAL REDUCTIONS ON A SMALL GROUP OF MAJOR PRODUCERS



Plastic products prepared for export reflect the globalised nature of plastic supply

As illustrated, Table 1 shows that state ownership is concentrated in precisely those regions driving global capacity expansion in Asia, the Middle East and Brazil within South America. This has profound implications for treaty design – state-owned enterprises (SOE) operate under long-term national industrial strategies rather than short-term commercial incentives, making them far less responsive to voluntary initiatives or market-driven signals.

By contrast, North America and Europe are overwhelmingly privately owned, with multinational petrochemical corporations accounting for over 85-99 per cent of production. This divide shapes the political landscape with regions dominated by privately owned enterprises tending to be more open to production-reduction measures while SOE-heavy regions often have stronger strategic, fiscal and geopolitical incentives to continue expanding capacity.

Together, these dynamics highlight a key structural reality – a small number of countries with SOE contribute disproportionately to global plastic supply and commitments from these producers to curb global plastic production have fallen short.

## HOW DOES IT MOVE?

Global trade in standard plastic shows a pronounced imbalance between regions when comparing imports and exports in gross terms. The data from 2020-24 reveals that a small number of regions dominate exports, while several other rely heavily on imports to meet demands.

Europe is consistently the world's largest import region. In 2020, Europe imported 80.6 million tonnes while exporting 29.8 million tonnes, meaning imports were approximately 170 per cent higher than exports (Figure 5 and 6). This pattern persists throughout the period. By 2040, Europe imports fall to 66.1 million tonnes, but exports remain limited at 24.8 million tonnes, leaving imports still about 2.5 times higher than exports. These figures confirm Europe's structural dependence on external supply, despite its role as a significant exporter in absolute terms.

Asia combines very high import demand with large export volumes. In 2020, Asia exported 42 million tonnes while importing 71.8 million tonnes, meaning imports exceeded exports by roughly 30 million tonnes, or about 70 per cent. Although Asian imports decline steadily over the period, falling to 47 million tonnes in 2024, exports also decline slightly to 35.8 million tonnes (Figures 5 and 6). As a result, Asia remains import-dependent throughout the period, reflecting the scale of domestic manufacturing and consumption.

The Middle East is one of the clearest export-oriented regions. In 2020, it exported 35.7 million tonnes while importing just 4.2 million tonnes, meaning exports were more than eight times imports (Figures 5 and 6). By 2024, exports stood at 26.1 million tonnes compared with imports of 1.2 million tonnes, with exports exceeding

***Table 1:*** *Comparison of state-owned and private-sector polymer production across regions. Source: Polyglobe*

| Region | Number of state-owed producers | State owned production (million tonnes) | State-owned share of regional production | Number of private-owned producers | Private production (million tonnesw) | Private share of regional production |
|---|---|---|---|---|---|---|
| **Africa** | 4 | 4.61 | 14% | 9 | 28.83 | 86% |
| **Asia** | 125 | 1,359.58 | 46% | 293 | 1,565.15 | 54% |
| **Europe** | 13 | 135.45 | 16% | 91 | 729.41 | 84% |
| **Middle East** | 18 | 1,709 | 87% | 39 | 260.99 | 13% |
| **North America** | 7 | 9.52 | 1% | 45 | 655.35 | 99% |
| **Pacific** | 1 | 2.31 | 36% | 5 | 4.02 | 64% |
| **South America** | 5 | 89.08 | 65% | 26 | 48.68 | 35% |

imports by more than 2,000 per cent. These figures underscore the region's role as a major supplier to global markets.

North America shows a stronger export-leaning profile, although less extreme than the Middle East. In 2020, exports totalled 27.2 million tonnes, compared with imports of 12 million tonnes, meaning exports are approximately 125 per cent higher than imports (Figures 5 and 6). This relationship remains broadly stable across the period. In 2024, exports reached 29.9 million tonnes, while imports were 11.2 million tonnes, maintaining exports at about 2.5 times the level of imports.

By contrast, South America and Africa remain modest players in global trade but are consistently import-dependent. In South America, imports exceed exports throughout the period, with imports of 5.3 million tonnes versus exports of 2.1 million tonnes in 2020, meaning imports are roughly 150 per cent higher. By 2024, imports rose to eight million tonnes, while exports increased sharply to 20.6 million tonnes (Figures 5 and 6) – a divergence from earlier years that suggests a late concentrated export surge. Africa imports between 2.3-2.8 million tonnes per year, while remaining below two million tonnes, leaving imports consistently 30-80 per cent higher than exports (Figures 5 and 6).

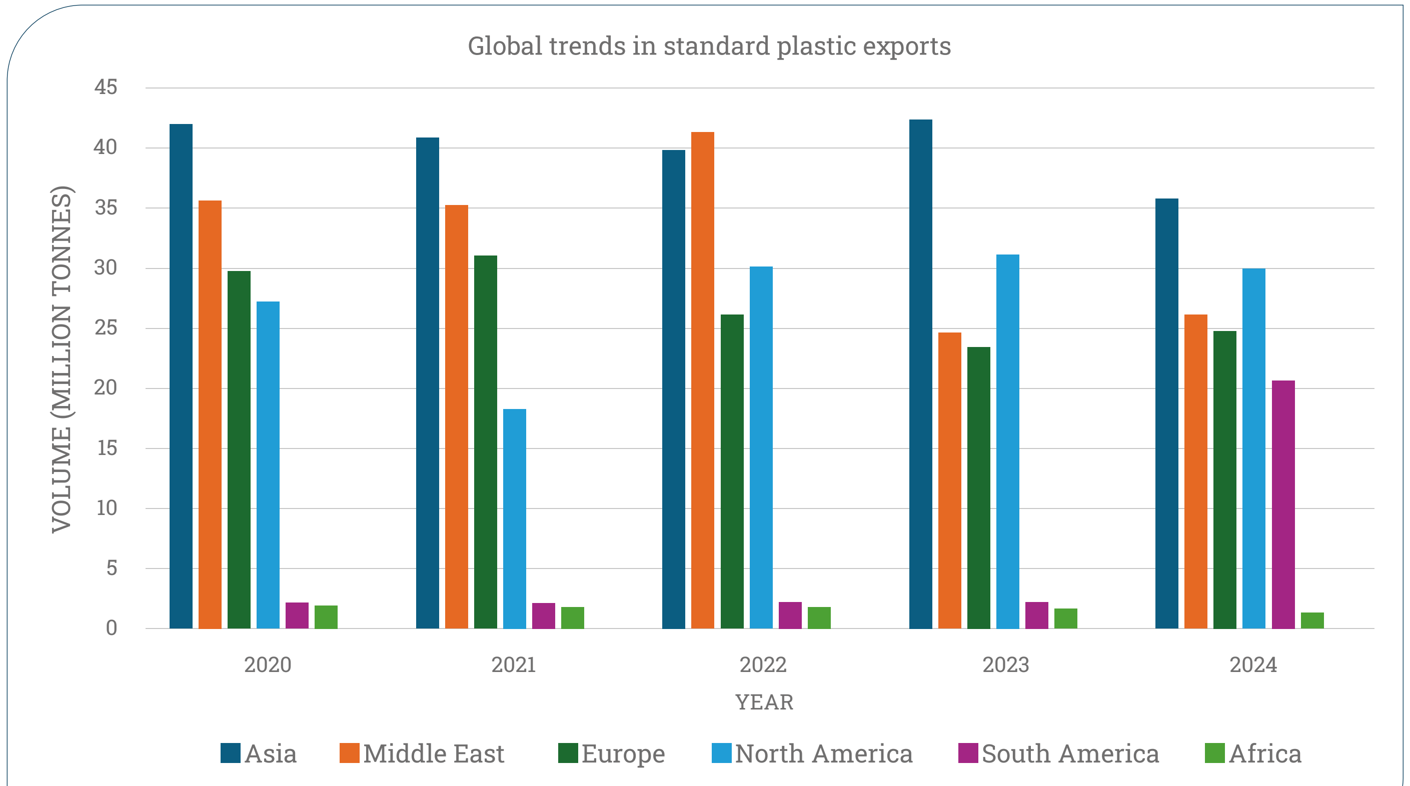
The Pacific remains marginal in absolute terms, with both imports and exports below 1.5 million tonnes throughout the period, although imports generally exceed exports (Figures 5 and 6).

Taken together, these figures show that the global plastics trade is structurally uneven. Export capacity is concentrated in a small number of regions, most notably the Middle East, North America and Asia, while Europe, Asia and South America rely heavily on imports. Importantly, this assessment reflects gross trade flows shown in the figures, addressing the apparent discrepancies that arise when net trade balances are inferred, accounting for the scale of both exports and imports.


Plastic waste accumulated along a shoreline, illustrating the scale of environmental leakage when waste systems fail to manage growing volumes of plastic


Mismanaged plastic waste enters marine ecosystems and persists in the environment

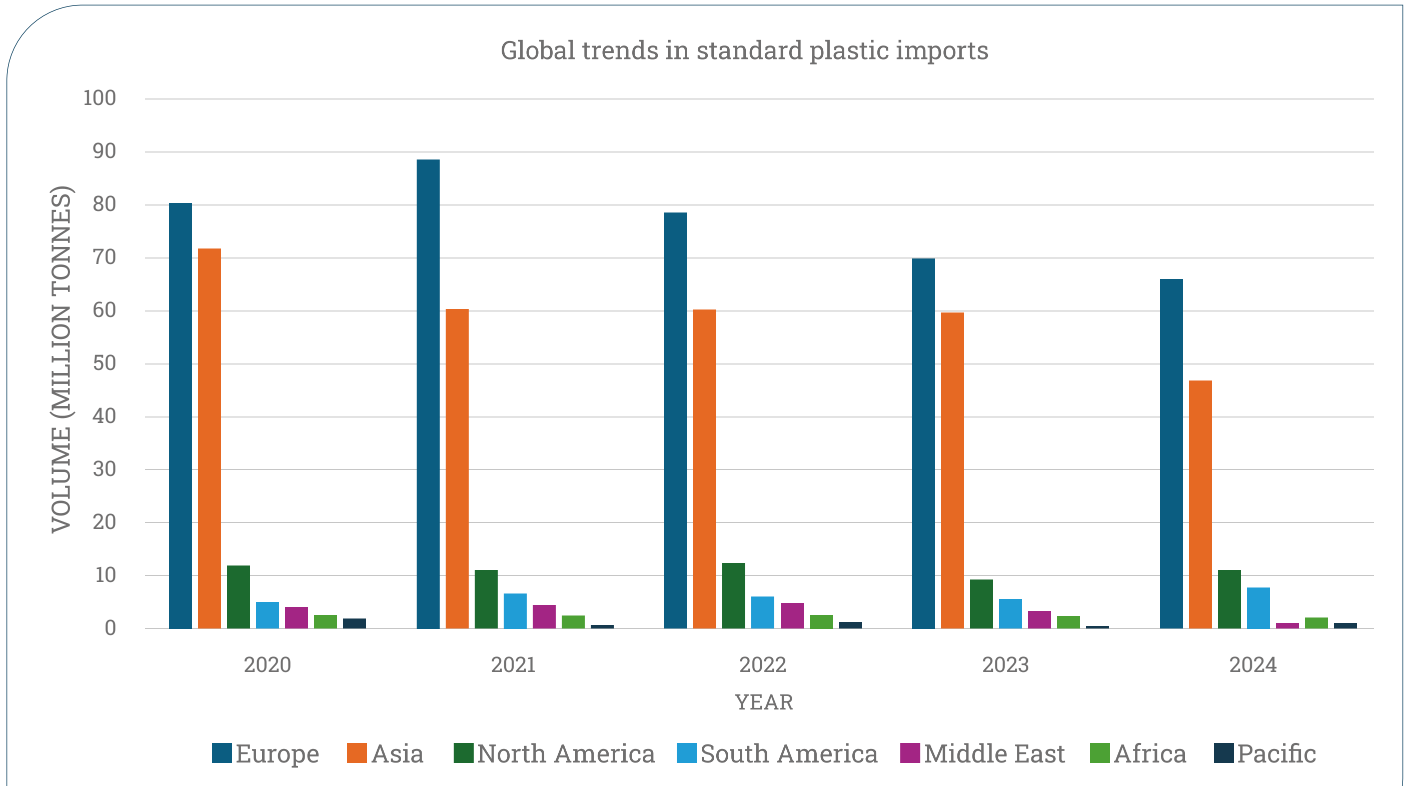
***Figure 5:** Standard plastic export volumes across global regions, 2020–2024.*
***Source:** [UN Comtrade]*




**KEY TAKEAWAY**

EXPORT CAPACITY IS CONCENTRATED IN A FEW REGIONS, INCREASING THE LIKELIHOOD THAT PRODUCTION IS DISPLACED RATHER THAN REDUCED IN THE ABSENCE OF COORDINATED ACTION

***Figure 6:** Standard plastic import volumes across global regions, 2020–2024*
***Source:** [UN Comtrade]*




**KEY TAKEAWAY**

CONSUMPTION IS CONCENTRATED IN MAJOR IMPORTING REGIONS, MEANING DEMAND SHIFTS CAN REDISTRIBUTE IMPACTS GLOBALLY RATHER THAN REDUCE OVERALL USE

Delegates gather for the opening plenary of INC 5.2 in Geneva

# MODELLING APPROACH AND JUSTIFICATION

**To explore how different approaches to addressing polymer production could shape the global plastic system, EIA commissioned Eunomia Research & Consulting Ltd to develop a series of modelling scenarios which examine how production, consumption, waste generation and greenhouse gas (GHG) emissions respond under varying levels of international participation and coordination, using emerging groupings of countries within the treaty negotiations to guide the scenarios.**

The modelling is illustrative rather than predictive. Its purpose is to understand how the global plastics system behaves when polymer-focused upstream controls are applied across different country groupings and under different trade assumptions. The modelling reflects the reality that plastic is produced in a relatively small number of countries but is consumed globally. For this reason, production and consumption are modelled separately at the country level. Where restrictions are applied, production and consumption do not necessarily change in tandem, creating surpluses or shortfalls which must be resolved in order to preserve mass balance across the system.

All scenarios share a common baseline year of 2026. From 2026-30, all countries will follow business-as-usual trajectories for polymer production and consumption based on Polyglobe[22] and OECD projections,[23] reflecting expected demand growth in the absence of additional policy intervention. From 2030 onwards, restrictions are applied only to countries participating in a given scenario.

Restrictions are defined as controls on the volume of plastic production and consumption. While upstream policy tools in practice may also include chemical restrictions, product bans or product design standards, the modelling focuses especially on polymer-level controls.[19] Application-level effects are therefore represented by polymer demand across major applications rather than by generic regulatory measures.

## CONSUMPTION RESTRICTIONS

Total polymer consumption is the primary driver of trade behaviour and the key variable shown in the scenario outputs.

Consumption follows OECD BAU projections up to 2030.[23] From 2030 onwards, polymer consumption in participating countries is restricted relative to 2025 levels and declines linearly to 40 per cent of those levels by 2040.

In non participating countries, consumption continues to follow the business-as-usual trajectory throughout the modelling period.

## PRODUCTION RESTRICTIONS

Primary polymer production also follows a business-as-usual trajectory through 2030, informed by OECD[23]

Every day, food items are packaged in single-use plastics, reflecting how convenience-driven consumption continues to drive unnecessary growth in plastic production

# MODELLED SCENARIOS

## In addition to a as business-as-usual case with no additional restrictions, the modelling examines a set of scenarios differentiated by which countries participate in polymer-focused upstream controls.

Countries are grouped based on observed negotiating dynamics within the INC process, drawing on consistent interventions and submissions rather than formal negotiating blocs.

The scenarios modelled are:

- ***Business-As-Usual*** – a reference case in which no additional restrictions on polymer consumption or production are applied. All countries follow OECD based projections for production and consumption over the full modelling period (Annex 1, Table 2)
- ***Scenario 1:*** Coalition of the Willing – a scenario in which a group of high ambition countries applies restrictions to both polymer consumption and primary production from 2030 onwards, in line with the restriction pathways defined above (Annex 1, Table 2)
- ***Scenario 2:*** Coalition of the Willing plus China – a scenario extending participation to include China, reflecting its central role in global polymer production, consumption, manufacturing and trade. The same consumption and production restrictions are applied consistently across all participating countries (Annex 1, Table 2)
- ***Scenario 3:*** Coalition of the Willing plus China plus Middle Countries – a further extension of the coalition to include a group of major emerging economies with rapidly growing plastic consumption and expanding production capacity (Annex 1, Table 2).

These scenarios are designed to explore how different levels of participation influence the dynamics of the global plastic economy when the same restriction pathways are applied across all participating countries.

data and Polyglobe[22] production projections. From 2030 onwards, primary production in participating countries is restricted relative to 2026 levels and declines linearly to 40 per cent by 2040.

No direct production constraints are applied in non participating countries, which continue along BAU production trajectories unless indirectly affected by the balancing mechanisms described below.

Primary and secondary production are not modelled independently. Secondary production is derived from recycling outputs and is aligned with OECD[23] benchmarks, with total production equal to the sum of primary and secondary supply.

## TRADE ASSUMPTIONS AND BOUNDARY CONDITIONS

For each scenario, two contrasting trade conditions are modelled to capture the boundaries of possible system responses to restrictions on production and consumption, namely the inclusion or not of non-party trade provisions.

Under the unrestricted global trade case, any surplus or shortfall created by restrictions in participating countries is redistributed to non participating countries. Non participating countries adjust production in proportion to their share of global primary production capacity so that total global supply always equals total global demand. This case represents a highly integrated global market in which production shifts readily across borders and provides an upper boundary on production and consumption outcomes.

Under the restricted global trade case, trade between participating and non participating countries is constrained. Production and consumption are balanced within each group separately, with the lower of the two becoming the binding value. Where production exceeds consumption, production is reduced; where consumption exceeds production, consumption is reduced. Trade is assumed to continue within each group, but not between groups. This represents a theoretical lower bound on production and consumption outcomes.

Real world outcomes are expected to fall between the unrestricted and restricted trade cases.

## PLASTIC WASTE GENERATION AND MANAGEMENT

Global plastic production continues to rise at a pace that far outstrips the world's ability to manage the waste it generates.

Despite decades of policy interventions and voluntary industry commitments to reduce plastic production and consumption, both plastic production and waste generation have continued to rise exponentially. The result is a widening gap between the amount of plastic society produces and the capacity of existing waste management systems to safely and practically process it.[24,25]

Recycling systems are unable to keep pace with rising levels of plastic production

A chief driver of waste leakage into the environment is the continued unsustainable growth of virgin plastic production and a lack of investment in alternative systems and policy approaches focused on reduction, reuse and waste prevention.[26]

In a world without regulatory intervention, annual volumes of mismanaged plastic waste could nearly double by 2040, mirroring production trajectories and placing additional pressure on already overburdened environments and communities.[27]

Research has shown that globally coordinated demand-based policy interventions could reduce annual volumes of mismanaged plastic waste by up to 90 per cent and cut virgin plastic use by 30 per cent by 2040, relative to 2019 levels,[28] but in this scenario controls on supply would still be required to meaningfully bend the curve from a climate, health and waste generation perspective.

Furthermore, the costs to developing countries for upgrading waste management infrastructure are estimated at $26 billion annually,[29] which is both prohibitive and unfeasible.

Against this backdrop, the modelling framework used in this report is designed to ensure that changes in waste outcomes are driven by changes in plastic consumption, rather than by assumed improvements in waste management performance. Plastic waste generation in all scenarios is derived directly from OECD[25] polymer consumption projections. Waste generation is calculated as a fixed fraction of consumption based on typical product lifespans across different polymer applications. This approach ensures internal consistency between production, consumption and waste generation.

Collection and sorting are then modelled using country level rates from the University of Leeds (UoL),[30] which are held constant over time. These rates reflect current structural conditions in waste systems rather than speculative future improvements. Sorting rates are similarly based on UoL's[30] estimates and are subsequently scaled to align with OECD projections for recycling,[31] ensuring consistency with internationally recognised benchmarks.

End-of-life waste management outcomes, including recycling, landfilling, incineration and mismanagement, are based on OECD treatment shares as set out in the *Global Plastics Outlook*.[25] Regional, yearly treatment proportions are applied to the modelled waste generation at the country, polymer and year level. Mismanaged waste is then further disaggregated into leakage, open burning and dumpsites, again using OECD derived proportions.

This modelling approach provides a transparent and conservative representation of the plastics economy in which waste outcomes respond directly to changes in polymer use while underlying waste management performance remains constant across scenarios.

The failure of current waste systems to manage growing volumes of plastic can often result in plastic waste being openly burned, releasing toxic emissions and greenhouse gases

This allows the analysis to isolate the effects of upstream production and consumption measures, as well as different configurations of participation and trade, on global plastic flows, waste generation and environmental impacts.

## CLIMATE IMPERATIVE

The climate crisis is no longer a distant or abstract threat. It is unfolding in real-time, across continents and seasons, in the form of severe floods, prolonged droughts, crop failures, heatwaves and other extreme weather events. Every fraction of additional warming risks crossing irreversible tipping points with positive feedback loops, thresholds that could trigger runaway global heating and ecosystem collapse.

Each stage of the plastic lifecycle contributes GHG emissions. The heavy industrial processes associated with plastic production, in particular from extraction to product shaping, disproportionately impact its overall carbon footprint.

To capture these dynamics, the modelling framework assesses GHG emissions across both production and end of life stages of the plastics system. Emissions from polymer production are calculated using polymer specific emissions factors developed by Lawrence Berkeley National Laboratory (LBNL).[32] These factors reflect the full lifecycle of emissions, covering extraction, feedstock processing, polymerisation and product shaping.

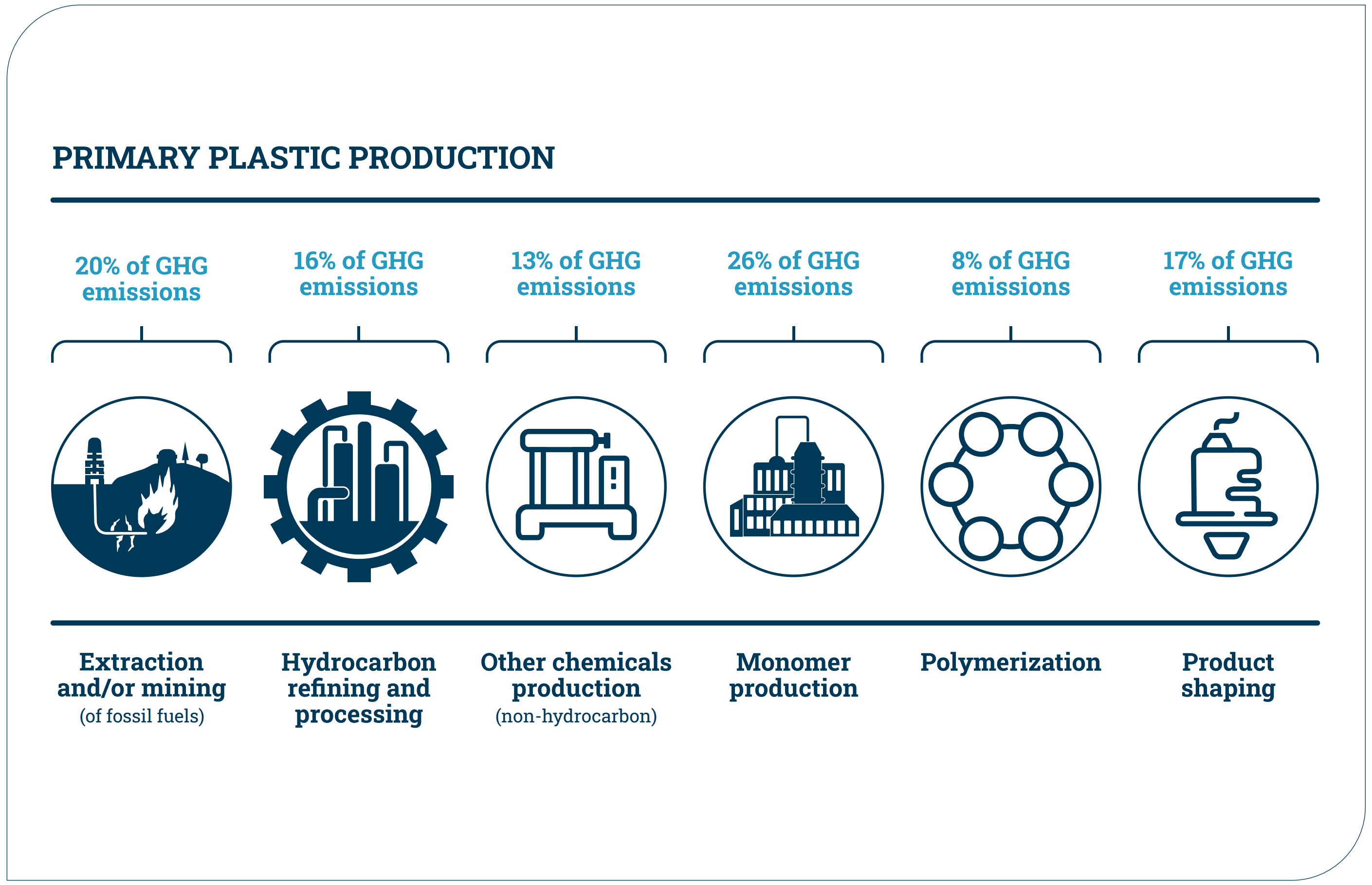
This approach allows emissions to scale directly with changes in polymer production volumes under each scenario, ensuring sensitivity to shifts in upstream supply.

Emissions from end of life waste management are calculated using an average of emissions factors drawn from the US EPA's Waste Reduction Model (WARM)[33] and Plastics Recyclers Europe (PRE).[34] These factors cover all major waste management pathways, including collection, pretreatment and sorting, transport, recycling, incineration and landfilling. Importantly, the model reports net GHG emissions because end of life emissions factors include both positive emissions from waste treatment processes and avoided emissions associated with recycling, reflecting displacement of virgin material production.

Taken together, this approach provides a conservative and transparent representation of plastics related GHG emissions, allowing the analysis to isolate the climate implications of upstream controls on polymer production and use.

It reinforces a central conclusion of the report – without measures to curb the growth of primary plastic production, improvements in downstream waste management alone will be insufficient to align the plastics system with global climate goals.

*Figure 7: GHG emission shares of the stages of plastic production in 2019.*
*Source: LBNL*



# MODEL ANALYSIS

## PRIMARY AND SECONDARY PLASTIC PRODUCTION

Plastic production lies at the core of the global plastics crisis. Under the different scenarios and depending on whether they are accompanied by restrictions on international trade, distinct outcomes emerge for total global plastic production by 2040.

These outcomes are assessed against a business-as-usual baseline, under which total plastic production reaches approximately 766 million tonnes in 2040 (Figure 8):

- ***Scenario 1.*** Global plastic production falls below business-as-usual levels under both trade assumptions. With unrestricted global trade, total production in 2040 declines to approximately 641 million tonnes, representing a reduction of 125 million tonnes (16 per cent) below business-as-usual. When trade is restricted, production falls further to 626 million tonnes, corresponding to a reduction of 140 million tonnes (18 per cent) below business-as-usual

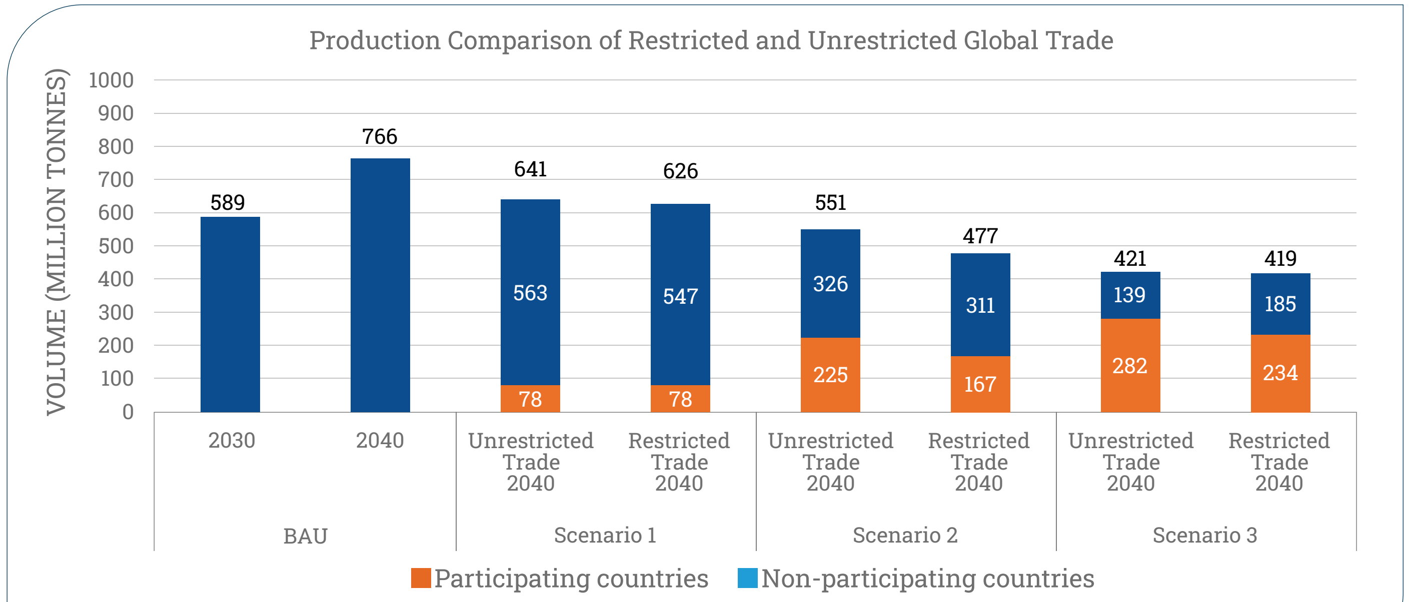
- ***Scenario 2.*** Stronger upstream controls deliver substantially larger reductions in production. Under unrestricted trade, total production in 2040 declines to approximately 551 million tonnes, equivalent to a reduction of 215 million tonnes (28 per cent) or below business-as-usual. Under restricted trade, production contracts more sharply to 477 million tonnes, representing a reduction of 289 million tonnes (38 per cent) below business-as-usual

- ***Scenario 3.*** Delivers the deepest production curve. Under unrestricted trade, total plastic production falls to approximately 421 million tonnes by 2040, representing a reduction of 345 million tonnes (45 per cent) below business-as-usual. Under restricted trade, production reaches a very similar level of 419 million tonnes, corresponding to a reduction of 347 million tonnes, also approximately (45 per cent) below business-as-usual. At this level of ambition, outcomes converge across trade assumptions as broad participation limits the potential for production displacement.

Across all scenarios, secondary plastic production increases as a share of total output. Under business-as-usual, it accounts for approximately 9.6 per cent of total production in 2040. This share rises modestly in Scenario 1 and more markedly in Scenarios 2 and 3, reaching up to 14.5 per cent under unrestricted trade and 12.5 per cent under restricted trade by 2040 in Scenario 3. These increases reflect declining primary production rather than a rapid expansion of recycling capacity.

Across scenarios, the results illustrate that reductions in production in participating countries are partly offset by increased output in non-participating countries under unrestricted trade, whereas this displacement is prevented under restricted trade and with greater environmental benefit. In the most ambitious scenario, outcomes converge across both trade assumptions, indicating that consumption constraints rather than trade dynamics ultimately drive global production levels.

*Figure 8: Impacts of restricted and unrestricted global trade on total primary and secondary plastic production across all scenarios, against a business-as-usual baseline reaching approximately 766 million tonnes in 2040.*




**KEY TAKEAWAY**

SIGNIFICANT REDUCTIONS IN PRODUCTION ARE ONLY ACHIEVED WHEN PARTICIPATION BROADENS, UNDERSCORING THE IMPORTANCE OF COLLECTIVE ACTION

## POLYMER USE


Rising reliance on single-use plastic packaging is fuelling continued growth in plastic production

Polymer consumption is the principal driver of demand across the plastics system and the most direct determinant of downstream waste generation and pollution.

Under the different scenarios and depending on whether or not they are accompanied by restrictions on international trade, distinct outcomes emerge for total global polymer use by 2040, including both primary and secondary polymers. All results are assessed against a business-as-usual baseline, under which global polymer use continues to rise to approximately 766 million tonnes in 2040 (Figure 9):

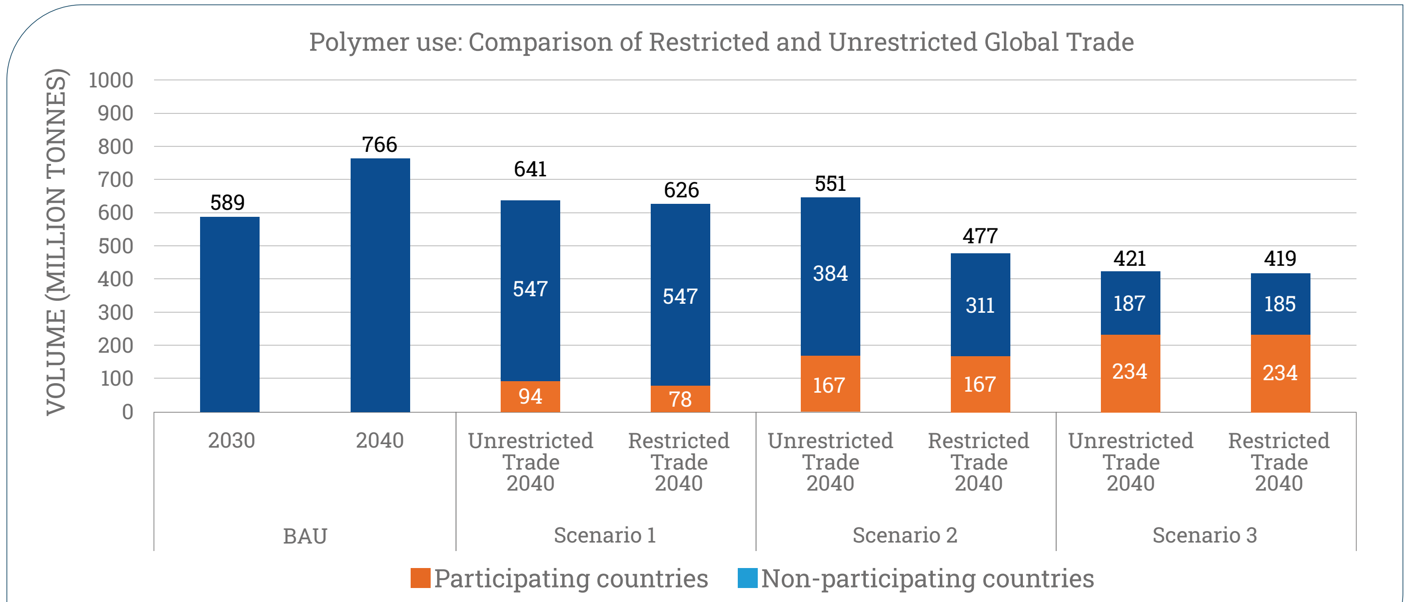
- ***Scenario 1.*** Global polymer use declines modestly relative to business-as-usual under both trade assumptions. With unrestricted global trade, total polymer use in 2040 falls to approximately 641 million tonnes, representing a reduction of 125 million tonnes (16 per cent) below business-as-usual. Under restricted trade, polymer use declines further to 626 million tonnes, corresponding to a reduction of 140 million tonnes (18 per cent below business-as-usual)

- ***Scenario 2.*** Delivers substantially larger reductions in polymer use. Under unrestricted trade, global polymer use in 2040 declines to approximately 551 million tonnes, equivalent to a reduction of 215 million tonnes, or about 28 per cent below business-as-usual. When trade is restricted, polymer use contracts more sharply to 477 million tonnes, representing a reduction of 289 million tonnes, or approximately 38 per cent below business-as-usual. As in Scenario 1, unrestricted trade allows a significant share of remaining polymer use to occur in non participating countries, while restricted trade limits this effect

- ***Scenario 3.*** Delivers the largest reductions in polymer use under both trade assumptions. With unrestricted trade, total polymer use in 2040 falls to approximately 421 million tonnes, representing a reduction of 345 million tonnes, or about 45 per cent below the business-as-usual baseline. Under restricted trade, polymer use reaches a very similar level of 419 million tonnes, corresponding to a reduction of 347 million tonnes, also about 45 per cent below business-as-usual. At this level of ambition, outcomes converge across trade assumptions, indicating that broad participation significantly constrains the scope for consumption displacement.

Across all scenarios, these results underline the central role of consumption controls in addressing plastic pollution. They also show that significant global decreases in polymer use require wide participation since partial participation allows continued growth in non participating countries, whereas broader inclusion limits leakage and strengthens global outcomes.

*Figure 9: Impacts of restricted and unrestricted global trade on polymer uses plastic across all scenarios, against a business-as-usual baseline reaching approximately 766 million tonnes in 2040.*




**KEY TAKEAWAY**

LIMITED PARTICIPATION ALLOWS CONSUMPTION TO SHIFT RATHER THAN DECLINE, HIGHLIGHTING THE NEED FOR WIDESPREAD ENGAGEMENT TO DELIVER REAL REDUCTIONS

## PLASTIC WASTE GENERATED

Plastic waste generation is directly linked to polymer consumption and reflects how the amount of plastic used and the typical lifespans of products translate into waste over time.

Under the different scenarios and depending on whether they are accompanied by restrictions on international trade, distinct outcomes emerge for total global plastic waste generated by 2040. Against a business-as-usual baseline, under which plastic waste generation continues to rise to approximately 621 million tonnes in 2040 (Figure 10):

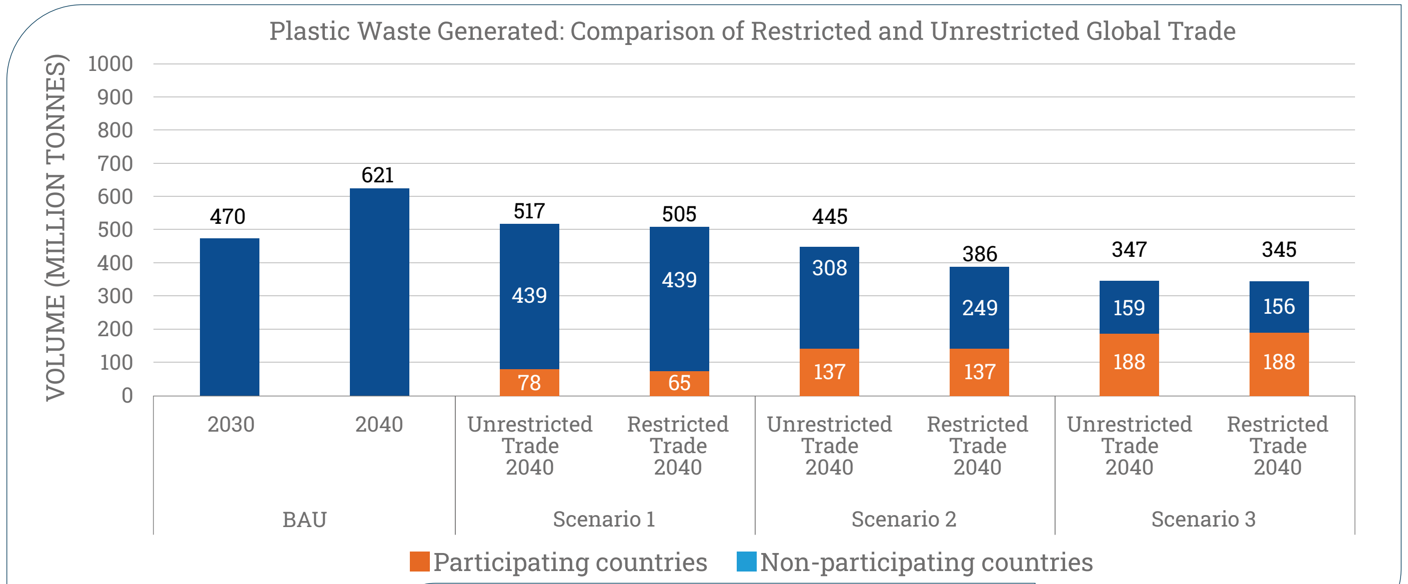
Plastic waste overflowing in urban waste collection systems, illustrating how rising consumption translates directly into increasing volumes of plastic waste

- ***Scenario 1.*** Global plastic waste generation declines below business-as-usual levels under both trade assumptions. With unrestricted global trade, total waste generated in 2040 falls to approximately 517 million tonnes, representing a reduction of 104 million tonnes (17 per cent) below business-as-usual. When trade is restricted, waste generation declines further to 505 million tonnes, corresponding to a reduction of 116 million tonnes (19 per cent) below business-as-usual
- ***Scenario 2.*** Delivers substantially larger reductions in plastic waste generation. Under unrestricted trade, waste generated in 2040 declines to approximately 445 million tonnes, equivalent to a reduction of 176 million tonnes (28 per cent) below business-as-usual. Under restricted trade, waste generation contracts sharply to 386 million tonnes, a reduction of 235 million tonnes (38 per cent) business-as-usual BAU. The deeper reduction under restricted trade reflects constraints on the reallocation of production and consumption across borders
- ***Scenario 3.*** Delivers the largest reductions in plastic waste under both trade assumptions. With unrestricted trade, waste generation in 2040 falls to approximately 347 million tonnes, representing a reduction of 274 million tonnes (44 per cent) below business-as-usual. Under restricted trade, waste generation reaches a similar level of approximately 345 million tonnes, corresponding to a reduction of 267 million tonnes (44 per cent) below business-as-usual. At this level of ambition, outcomes converge across trade assumptions, indicating that broad participation substantially limits the scope for waste displacement.

Across all scenarios, these results demonstrate that upstream controls on primary and secondary plastic production and use can deliver substantial reductions in plastic waste generation.

However, as with production and consumption outcomes, the scale of these reductions depends on the breadth of participation and the extent to which trade allows waste generation to be displaced across regions.

***Figure 10:*** *Impacts of restricted and unrestricted global trade on plastic waste generated across all scenarios, against a business-as-usual baseline reaching approximately 621 million tonnes in 2040.*




**KEY TAKEAWAY**

WASTE REDUCTIONS TRACK PRODUCTION AND CONSUMPTION, REINFORCING THAT DOWNSTREAM MEASURES ALONE CANNOT KEEP PACE WITH RISING VOLUMES

## MISMANAGED PLASTIC WASTE

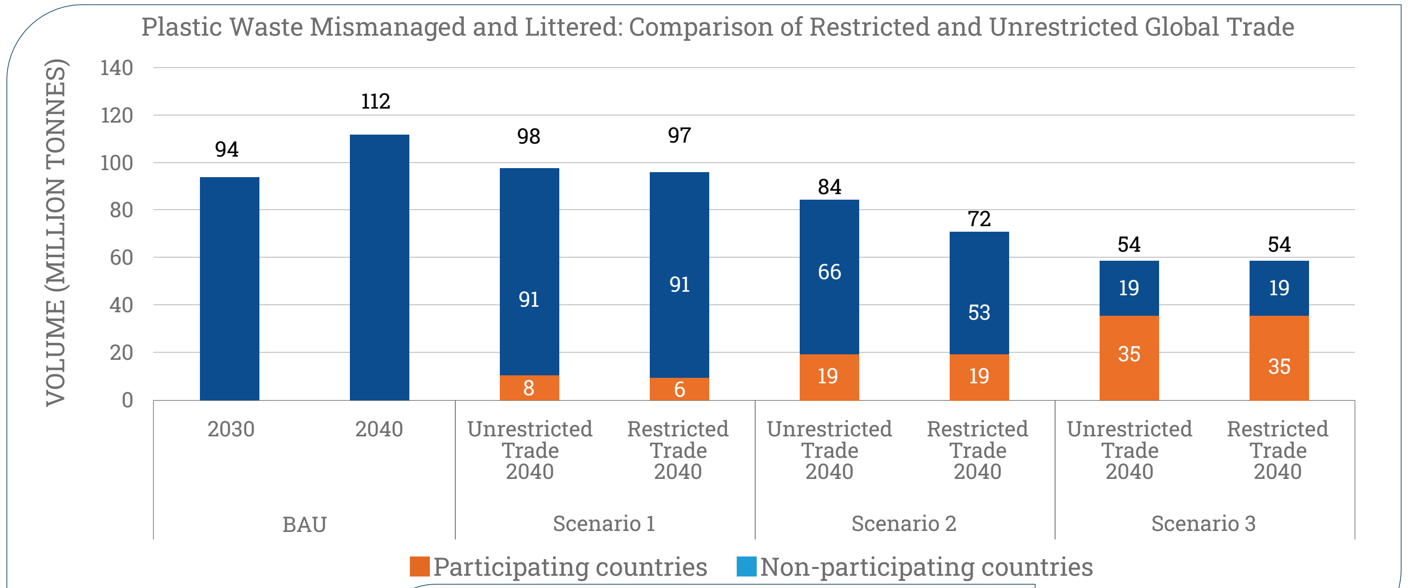
Mismanaged plastic waste has a direct impact on ecosystems, public health and livelihoods. Reductions in mismanaged waste therefore provide a critical test of environmental effectiveness. Across different scenarios, depending on whether they are accompanied by restrictions on international trade, distinct outcomes emerge for global volumes of mismanaged or littered plastic waste by 2040. Against a business-as-usual baseline, under which it continues to rise to approximately 112 million tonnes by 2040, under both unrestricted and restricted trade assumptions (Figure 11):

Plastic waste accumulating in waterways, highlighting the environmental impacts of mismanaged plastic and its direct pathway into natural ecosystems

- ***Scenario 1.*** Mismanaged plastic waste declines modestly relative to business-as-usual. With unrestricted global trade, mismanaged waste falls to approximately 98 million tonnes by 2040. Under restricted trade, waste levels decline slightly further to around 97 million tonnes. In both cases, the majority of remaining mismanaged waste continues to arise in non participating countries, where waste management systems are least equipped to manage growing volumes of plastic waste
- ***Scenario 2.*** Stronger upstream controls on primary and secondary plastic production and consumption deliver more substantial reductions in mismanaged waste. Under unrestricted trade, mismanaged  waste declines to approximately 84 million tonnes by 2040. When trade is restricted, volumes fall further to about 72 million tonnes, underscoring the role of trade based displacement in shaping environmental outcomes
- ***Scenario 3.*** Delivers the largest reductions in mismanaged plastic waste. Under unrestricted global trade, waste volumes decline sharply to about 54 million tonnes by 2040. Under restricted trade, levels fall to a very similar 53 million tonnes, representing reductions of more than 50 per cent relative to the business-as-usual baseline. At this level of ambition, outcomes converge across trade assumptions, indicating that broad participation substantially limits the scope for displacement of pollution.

Across all scenarios, these results reinforce a central message for the treaty negotiations – without upstream controls on primary and secondary plastic production and use, plastic pollution continues to rise even as waste management systems improve. Only ambitious, coordinated action across production and consumption can deliver sustained reductions in mismanaged plastic waste and meaningfully reduce environmental leakage, at a global scale.

***Figure 11:*** *Impacts of restricted and unrestricted global trade on plastic waste mismanaged and littered across all scenarios, against a business-as-usual baseline reaching approximately 112 million tonnes in 2040.*




**KEY TAKEAWAY**

MISMANAGED WASTE DECLINES MEANINGFULLY ONLY UNDER AMBITIOUS AND WIDELY ADOPTED MEASURES, WITH LIMITED ACTION LEAVING POLLUTION LARGELY UNCHANGED

## NET GHG EMISSIONS

Under business-as-usual, annual GHG emissions from primary plastic production will rise from 2.3 billion tonnes (Gt) carbon-dioxide equivalence ($CO_2$e) in 2025 to ***3.5 Gt $CO_2$e in 2040*** – an increase of 52 per cent from 2025 levels.[34]

Once in the economy, end-of-life management of plastics further contributes GHG emissions, resulting from waste collection, pre-treatment, sorting, transportation and recycling, incineration or landfill (even considering the avoided emissions from recycling and energy recovery). Taken together, under business-as-usual the annual net GHG emissions from plastic production and end-of-life management of plastics increases to more than ***3.8 GT $CO_2$e in 2040*** (Figure 12).

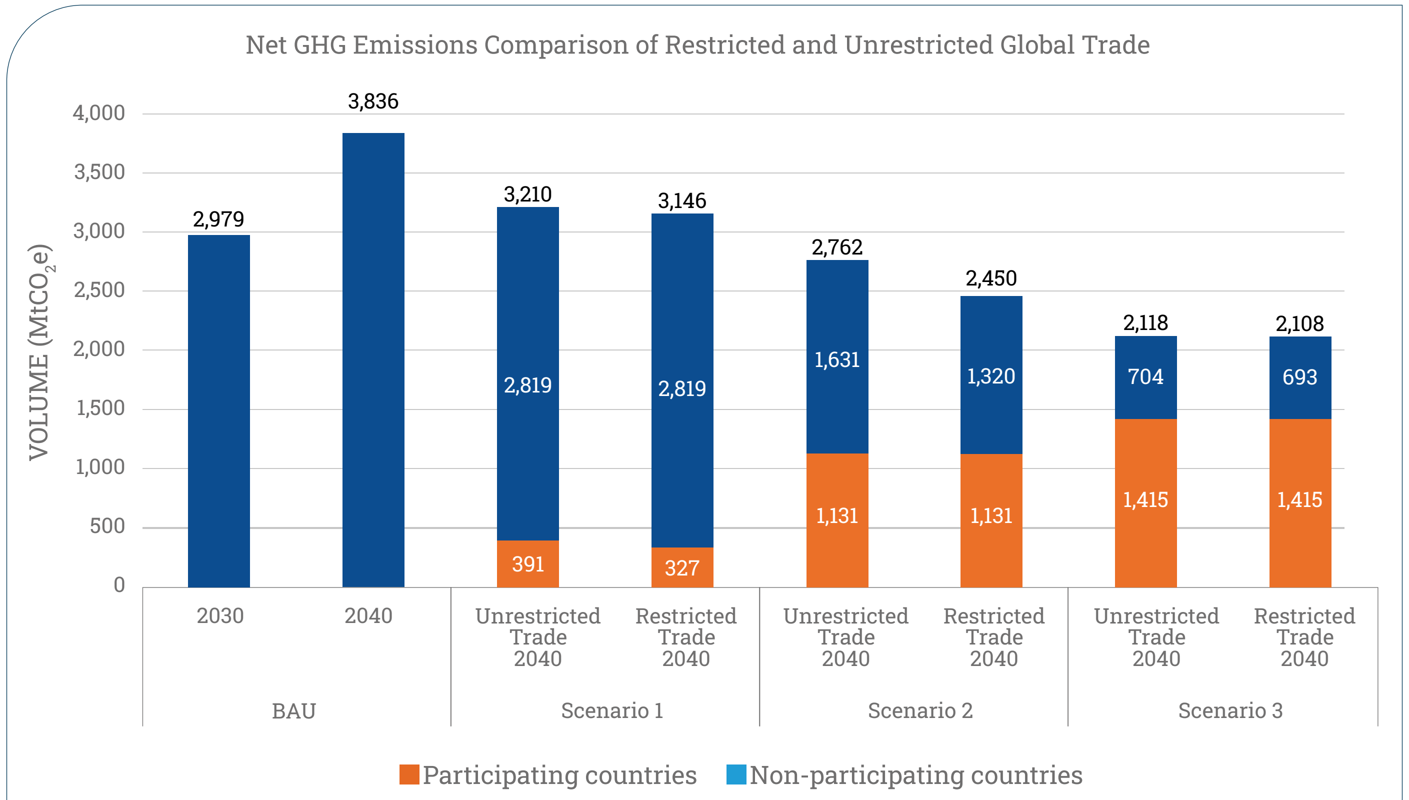
To put these figures into context, the Paris Agreement sets out a global ambition to limit global average temperature to 2°C above pre-industrial levels and to pursue efforts to stay within 1.5°C with minimal overshoot. From 2025 onward, to give humanity a 50 per cent chance of staying within 2°C and 1.5°C, the remaining carbon budget in 2025 was 1,050 Gt $CO_2$ and 130 Gt $CO_2$, respectively.[34,35]

From 2025-40, under business-as-usual the cumulative total GHG emissions is ***51.1 Gt $CO_2$e***, or roughly 39 per cent of the remaining carbon budget to give humanity even odds of staying within 1.5°C.

***Table 2:*** *Updated estimates of remaining carbon budgets for five levels of likelihood.*
***Source:*** *Indicators of Global Climate Change 2024.*

| Temperature (°C) | Estimated remaining carbon budgets from the beginning of 2025 ($GtCO_2$) | | | | |
|---|---|---|---|---|---|
| Avoidance Probability: | 17% | 33% | 50% | 67% | 83% |
| 1.5 | 320 | 200 | 130 | 80 | 30 |
| 1.6 | 620 | 420 | 310 | 240 | 160 |
| 1.7 | 910 | 640 | 490 | 390 | 290 |
| 2.0 | 1790 | 1310 | 1050 | 870 | 690 |

***Figure 12:*** *Impacts of restricted and unrestricted global trade on net GHG emissions across all scenarios, against a business-as-usual baseline reaching approximately 3.8 GT $CO_2$e in 2040.*




**KEY TAKEAWAY**

PLASTIC EMISSIONS ARE DRIVEN PRIMARILY BY PRODUCTION VOLUMES, MAKING UPSTREAM CONTROLS ESSENTIAL FOR CLIMATE OUTCOMES



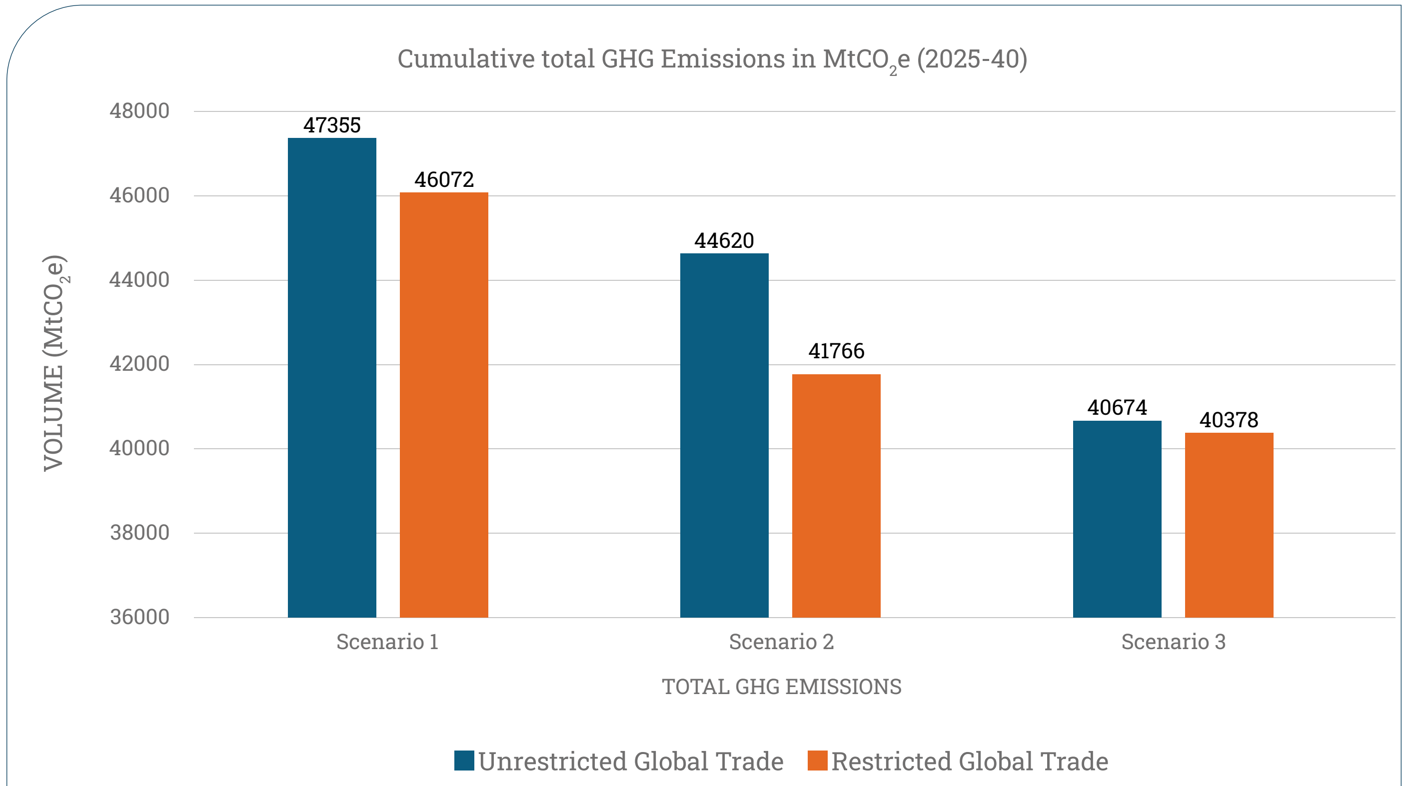
Under the different scenarios, depending on whether accompanied or not by restrictions on trade, the following cumulative total GHG emissions by 2040 are calculated as:

- ***Scenario 1.*** Cumulative total GHG emissions decline to approximately ***47.3 Gt $CO_2$e*** under unrestricted trade and ***46 Gt $CO_2$e*** under restricted trade, presenting a reduction of 3.8-5.1 Gt $CO_2$e Gt below business-as-usual, respectively
- ***Scenario 2.*** Cumulative total GHG emissions decline to approximately ***44.6 Gt $CO_2$e*** under unrestricted trade and ***41.7 Gt $CO_2$e*** under restricted trade, presenting a reduction of 6.5-9.4 Gt $CO_2$e Gt below business-as-usual, respectively
- ***Scenario 3.*** Cumulative total GHG emissions decline to approximately ***40.6 Gt $CO_2$e*** under unrestricted trade and ***40.3 Gt $CO_2$e*** under restricted trade, presenting a reduction of ***10.5-10.8 Gt $CO_2$e Gt*** below business-as-usual, respectively.

The climate imperative of addressing plastic production cannot be overstated. It is difficult not to be alarmist in the face of the scientific reality. Under any scenario, plastics are poised to play a disproportionate role in pushing the planet above the 1.5°C threshold, but those contributions can be reduced to allow additional time for the necessary economy-wide transitions in other sectors and help to avoid the most dangerous climate impacts.

Plastic production at a petrochemical facility, where emissions from fossil fuel-based processes contribute directly to climate change

***Figure 13:*** *Graph showing cumulative total greenhouse gas emissions (2025–40) under business-as-usual of 51,148 $MtCO_2$e and alternative restricted and unrestricted global trade scenarios.*




**KEY TAKEAWAY**

EARLY AND COORDINATED REDUCTIONS IN PLASTIC PRODUCTION DELIVER SUBSTANTIAL CUMULATIVE EMISSIONS SAVINGS OVER TIME

# SUMMARY OF FINDINGS

**The modelling results confirm that meaningful reductions in plastic production, consumption and pollution are only achievable if ambitious upstream measures are implemented at scale.**[20,36]

While downstream actions such as recycling and waste management remain essential, they cannot keep pace if the volume of plastic entering the system continues to grow unchecked.

As EIA has repeatedly highlighted in its analysis of the negotiations, a treaty which prioritises downstream measures while avoiding controls on virgin plastic production would risk locking in failure by managing the symptoms of plastic pollution rather than addressing its root cause.[36,37] The Global Plastics Treaty must therefore establish a strong and enforceable baseline centred on reducing virgin plastic production and consumption, consistent with the full lifecycle mandate set out under UNEA resolution 5/14.[38]

At the same time, the treaty should be designed as a global floor of ambition rather than a ceiling. Experience from the INC process shows that progress has been repeatedly constrained by a small number of producing states seeking to exclude production from the treaty's scope. The modelling and EIA's negotiations analysis both demonstrate that meaningful global outcomes do not depend on universal consensus from the outset. Instead, the treaty should enable leadership by coalitions of willing countries and flexible participation pathways that allow ambition to advance even where unanimity or consensus remain elusive. Such approaches are consistent with international practice and can help create momentum, demonstrate feasibility and ultimately raise ambition across the regime over time.[39]

The treaty should also explicitly recognise the close relationship between plastic production, fossil-fuel use and climate change, while promoting coherence with climate and industrial policy frameworks.

EIA's analysis shows that treating plastics in isolation risks creating regulatory blind spots and enabling continued investment in emissions intensive infrastructure that undermines both climate and pollution objectives.[19,20] Countries must therefore be able – and encouraged – to reinforce treaty commitments through action outside the INC negotiations, including via climate strategies, industrial policy, trade measures and fossil-fuel transition planning.

Finally, the treaty should clearly affirm that downstream measures are only effective when anchored in upstream controls. Prevention at source remains the most effective, equitable and durable means of reducing plastic waste, pollution and environmental harm.[36] By setting a firm global baseline while enabling accelerated action beyond its text, the Global Plastics Treaty can lay the foundations for ending plastic pollution in practice rather than on paper.

# MIDDLE POWERS ARE NOT POWERLESS. ALTERNATIVE PATHWAYS COULD BEND THE PLASTICS CURVE.

# CONCLUSION

**The evidence set out in this report points to a simple but unavoidable reality – plastic pollution cannot be solved solely through downstream measures while the volume of plastic entering the system continues to grow.**

Recycling, improved waste collection and cleaner product design all play an important role, but they cannot restore order if the volume of plastic entering the economy continues to rise. Truly ending plastic pollution and delivering on the ambition of Resolution 5/14 requires directly confronting the production of primary plastic polymers. Controls on plastic production are not a peripheral option but a necessary condition for achieving the climate, circular economy and sustainable development commitments governments have already made.

This report reinforces that the effectiveness of the Global Plastics Treaty will hinge on a small number of core design choices. These include: the level of collective ambition that countries are willing to commit to; whether the treaty meaningfully addresses polymers that are hazardous, difficult to recycle or prone to environmental leakage; how it tackles the dominance of high volume plastics that drive global production and waste; and how responsibilities are shared between countries, whether through globally agreed controls, nationally implemented pathways or hybrid approaches.

Together, these decisions will determine whether the treaty is capable of delivering real reductions in plastic production and pollution or whether it remains limited to managing impacts after they occur.

To explore these dynamics, the report modelled a range of illustrative scenarios reflecting different levels of participation and cooperation on upstream controls. These scenarios are not prescriptive recommendations, but demonstrations of what becomes possible once limits are placed on plastic production and consumption.

The results show that targeting a relatively small number of high volume polymers — those responsible for a disproportionate share of waste generation, pollution and emissions — can deliver substantial reductions in overall production, alongside sharp declines in environmental harm. Once enough countries act together, displacement shrinks, outcomes converge and collective action starts to work.

The choice facing negotiators is clear - The Global Plastics Treaty can either continue to manage the symptoms of a growing plastics economy or change the rules so that growth itself pivots towards sustainable systems and a genuine circular economy designed to protect human and environmental health.

By embedding upstream controls on plastic production and consumption and allowing countries to move faster and further through flexibility mechanisms and cooperation beyond the treaty text, the new instrument can create the certainty required to shift the system towards a more sustainable future.

# Annex

***Table 3:*** *Country groupings applied across the four modelled scenarios. Countries listed under each scenario are those which adopt upstream production and consumption measures in that scenario model, while countries not listed are treated as non-participating.*

*The grouping reflects plausible political configurations observed in the INC negotiations and are used consistently across the modelling to assess how different levels of international participation influence global outcomes for plastic production, consumption, trade, waste generation and GHG emissions.*

| BUSINESS-AS-USUAL | SCENARIO 1 | SCENARIO 2 | SCENARIO 3 |
|---|---|---|---|
| Afghanistan | | | Afghanistan |
| Albania | | | Albania |
| Algeria | | | |
| American Samoa | | | |
| Andorra | | | Andorra |
| Angola | | | Angola |
| Antigua and Barbuda | Antigua and Barbuda | Antigua and Barbuda | Antigua and Barbuda |
| Argentina | | | Argentina |
| Armenia | Armenia | Armenia | Armenia |
| Aruba | | | Aruba |
| Australia | Australia | Australia | Australia |
| Austria | Austria | Austria | Austria |
| Azerbaijan | Azerbaijan | Azerbaijan | Azerbaijan |
| Bahamas, The | | | Bahamas, The |
| Bahrain | | | |
| Bangladesh | | | Bangladesh |
| Barbados | Barbados | Barbados | Barbados |
| Belarus | | | |
| Belgium | Belgium | Belgium | Belgium |
| Belize | | | Belize |
| Benin | Benin | Benin | Benin |
| Bermuda | | | Bermuda |
| Bhutan | | | Bhutan |
| Bolivia | | | Bolivia |
| Bosnia and Herzegovina | | | Bosnia and Herzegovina |
| Botswana | | | Botswana |
| Brazil | | | Brazil |
| British Virgin Islands | | | British Virgin Islands |
| Brunei Darussalam | | | Brunei Darussalam |
| Bulgaria | Bulgaria | Bulgaria | Bulgaria |
| Burkina Faso | Burkina Faso | Burkina Faso | Burkina Faso |
| Burundi | Burundi | Burundi | Burundi |
| Cabo Verde | Cabo Verde | Cabo Verde | Cabo Verde |
| Cambodia | Cambodia | Cambodia | Cambodia |
| Cameroon | | | Cameroon |
| Canada | Canada | Canada | Canada |
| Cayman Islands | | | Cayman Islands |
| Central African Republic | | | Central African Republic |
| Chad | | | Chad |
| Channel Islands | | | Channel Islands |
| Chile | Chile | Chile | Chile |
| China | | China | China |
| Colombia | Colombia | Colombia | Colombia |
| Comoros | Comoros | Comoros | Comoros |
| Congo, Dem. Rep. | Congo, Dem. Rep. | Congo, Dem. Rep. | Congo, Dem. Rep. |
| Congo, Rep. | | | Congo, Rep. |
| Costa Rica | Costa Rica | Costa Rica | Costa Rica |
| Côte d'Ivoire | Côte d'Ivoire | Côte d'Ivoire | Côte d'Ivoire |
| Croatia | Croatia | Croatia | Croatia |
| Cuba | | | |
| Curaçao | | | Curaçao |
| Cyprus | Cyprus | Cyprus | Cyprus |
| Czechia | Czechia | Czechia | Czechia |
| Denmark | Denmark | Denmark | Denmark |
| Djibouti | Djibouti | Djibouti | Djibouti |
| Dominica | | | Dominica |
| Dominican Republic | Dominican Republic | Dominican Republic | Dominican Republic |
| Ecuador | Ecuador | Ecuador | Ecuador |
| Egypt, Arab Rep. | | | |
| El Salvador | | | El Salvador |

# Annex (cont'd)

| BUSINESS-AS-USUAL | SCENARIO 1 | SCENARIO 2 | SCENARIO 3 |
|---|---|---|---|
| Equatorial Guinea | | | Equatorial Guinea |
| Eritrea | | | Eritrea |
| Estonia | Estonia | Estonia | Estonia |
| Eswatini | Eswatini | Eswatini | Eswatini |
| Ethiopia | | | Ethiopia |
| Faroe Islands | | | Faroe Islands |
| Fiji | Fiji | Fiji | Fiji |
| Finland | Finland | Finland | Finland |
| France | France | France | France |
| French Polynesia | French Polynesia | French Polynesia | French Polynesia |
| Gabon | Gabon | Gabon | Gabon |
| Gambia, The | Gambia, The | Gambia, The | Gambia, The |
| Georgia | Georgia | Georgia | Georgia |
| Germany | Germany | Germany | Germany |
| Ghana | Ghana | Ghana | Ghana |
| Gibraltar | Gibraltar | Gibraltar | Gibraltar |
| Greece | Greece | Greece | Greece |
| Greenland | Greenland | Greenland | Greenland |
| Grenada | Grenada | Grenada | Grenada |
| Guam | | | |
| Guatemala | Guatemala | Guatemala | Guatemala |
| Guinea | Guinea | Guinea | Guinea |
| Guinea-Bissau | Guinea-Bissau | Guinea-Bissau | Guinea-Bissau |
| Guyana | | | Guyana |
| Haiti | | | Haiti |
| Honduras | Honduras | Honduras | Honduras |
| Hong Kong SAR, China | | Hong Kong SAR, China | Hong Kong SAR, China |
| Hungary | Hungary | Hungary | Hungary |
| Iceland | Iceland | Iceland | Iceland |
| India | | | India |
| Indonesia | | | |
| Iran, Islamic Rep. | | | |

| BUSINESS-AS-USUAL | SCENARIO 1 | SCENARIO 2 | SCENARIO 3 |
|---|---|---|---|
| Iraq | | | |
| Ireland | Ireland | Ireland | Ireland |
| Isle of Man | Isle of Man | Isle of Man | Isle of Man |
| Israel | Israel | Israel | Israel |
| Italy | Italy | Italy | Italy |
| Jamaica | Jamaica | Jamaica | Jamaica |
| Japan | Japan | Japan | Japan |
| Jordan | Jordan | Jordan | Jordan |
| Kazakhstan | | | Kazakhstan |
| Kenya | Kenya | Kenya | Kenya |
| Kiribati | | | Kiribati |
| Korea, Dem. People's Rep. | | | Korea, Dem. People's Rep. |
| Korea, Rep. | Korea, Rep. | Korea, Rep. | Korea, Rep. |
| Kosovo | | | Kosovo |
| Kuwait | | | |
| Kyrgyz Republic | | | Kyrgyz Republic |
| Laos | | | Laos |
| Latvia | Latvia | Latvia | Latvia |
| Lebanon | | | Lebanon |
| Lesotho | | | Lesotho |
| Liberia | Liberia | Liberia | Liberia |
| Libya | | | Libya |
| Liechtenstein | | | Liechtenstein |
| Lithuania | Lithuania | Lithuania | Lithuania |
| Luxembourg | Luxembourg | Luxembourg | Luxembourg |
| Macao SAR, China | | Macao SAR, China | Macao SAR, China |
| Madagascar | Madagascar | Madagascar | Madagascar |
| Malawi | Malawi | Malawi | Malawi |
| Malaysia | | | Malaysia |
| Maldives | Maldives | Maldives | Maldives |
| Mali | Mali | Mali | Mali |
| Malta | Malta | Malta | Malta |

# Annex (cont'd)

| BUSINESS-AS-USUAL | SCENARIO 1 | SCENARIO 2 | SCENARIO 3 |
|---|---|---|---|
| Marshall Islands | Marshall Islands | Marshall Islands | Marshall Islands |
| Mauritania | Mauritania | Mauritania | Mauritania |
| Mauritius | Mauritius | Mauritius | Mauritius |
| Mexico | Mexico | Mexico | Mexico |
| Micronesia, Fed. Sts. | Micronesia, Fed. Sts. | Micronesia, Fed. Sts. | Micronesia, Fed. Sts. |
| Moldova | Moldova | Moldova | Moldova |
| Monaco | Monaco | Monaco | Monaco |
| Mongolia | | | Mongolia |
| Montenegro | Montenegro | Montenegro | Montenegro |
| Morocco | | | Morocco |
| Mozambique | Mozambique | Mozambique | Mozambique |
| Myanmar | | | Myanmar |
| Namibia | Namibia | Namibia | Namibia |
| Nauru | | | Nauru |
| Nepal | | | Nepal |
| Netherlands | Netherlands | Netherlands | Netherlands |
| New Caledonia | | | New Caledonia |
| New Zealand | New Zealand | New Zealand | New Zealand |
| Nicaragua | | | Nicaragua |
| Niger | | | Niger |
| Nigeria | Nigeria | Nigeria | Nigeria |
| Northern Mariana Islands | | | Northern Mariana Islands |
| Northern Mariana Islands | | | Northern Mariana Islands |
| Norway | Norway | Norway | Norway |
| Oman | | | |
| Pakistan | | | Pakistan |
| Palau | Palau | Palau | Palau |
| Panama | Panama | Panama | Panama |
| Papua New Guinea | Papua New Guinea | Papua New Guinea | Papua New Guinea |
| Paraguay | | | Paraguay |
| Peru | Peru | Peru | Peru |
| Philippines | Philippines | Philippines | Philippines |

| BUSINESS-AS-USUAL | SCENARIO 1 | SCENARIO 2 | SCENARIO 3 |
|---|---|---|---|
| Poland | Poland | Poland | Poland |
| Portugal | Portugal | Portugal | Portugal |
| Puerto Rico | | | Puerto Rico |
| Qatar | | | |
| Romania | Romania | Romania | Romania |
| Russian Federation | | | |
| Rwanda | Rwanda | Rwanda | Rwanda |
| Samoa | | | Samoa |
| San Marino | | | San Marino |
| São Tomé and Príncipe | São Tomé and Príncipe | São Tomé and Príncipe | São Tomé and Príncipe |
| Saudi Arabia | | | |
| Senegal | Senegal | Senegal | Senegal |
| Serbia | | | Serbia |
| Seychelles | Seychelles | Seychelles | Seychelles |
| Sierra Leone | Sierra Leone | Sierra Leone | Sierra Leone |
| Singapore | | | Singapore |
| Sint Maarten (Dutch part) | Sint Maarten (Dutch part) | Sint Maarten (Dutch part) | Sint Maarten (Dutch part) |
| Slovak Republic | Slovak Republic | Slovak Republic | Slovak Republic |
| Slovenia | Slovenia | Slovenia | Slovenia |
| Solomon Islands | Solomon Islands | Solomon Islands | Solomon Islands |
| Somalia | | | Somalia |
| South Africa | | | South Africa |
| South Sudan | | | South Sudan |
| Spain | Spain | Spain | Spain |
| Sri Lanka | Sri Lanka | Sri Lanka | Sri Lanka |
| St. Kitts and Nevis | St. Kitts and Nevis | St. Kitts and Nevis | St. Kitts and Nevis |
| St. Lucia | | | St. Lucia |
| St. Martin (French part) | St. Martin (French part) | St. Martin (French part) | St. Martin (French part) |
| St. Vincent and the Grenadines | | | St. Vincent and the Grenadines |
| Sudan | | | Sudan |
| Suriname | | | Suriname |

# Annex (cont'd)

| BUSINESS-AS-USUAL | SCENARIO 1 | SCENARIO 2 | SCENARIO 3 |
|---|---|---|---|
| Sweden | Sweden | Sweden | Sweden |
| Switzerland | Switzerland | Switzerland | Switzerland |
| Syrian Arab Republic | | | Syrian Arab Republic |
| Taiwan, China | | Taiwan, China | Taiwan, China |
| Tajikistan | | | Tajikistan |
| Tanzania | | | Tanzania |
| Thailand | | | Thailand |
| Timor-Leste | | | Thailand |
| Togo | Togo | Togo | Togo |
| Tonga | | | Tonga |
| Trinidad and Tobago | | | Trinidad and Tobago |
| Tunisia | | | Tunisia |
| Türkiye | | | Türkiye |
| Turkmenistan | | | Turkmenistan |
| Turks and Caicos Islands | | | Turks and Caicos Islands |
| Tuvalu | Tuvalu | Tuvalu | Tuvalu |
| Uganda | | | |
| Ukraine | Ukraine | Ukraine | Ukraine |
| United Arab Emirates | United Arab Emirates | United Arab Emirates | United Arab Emirates |
| United Kingdom | United Kingdom | United Kingdom | United Kingdom |
| United States | | | |
| Uruguay | Uruguay | Uruguay | Uruguay |
| Uzbekistan | | | Uzbekistan |
| Vanuatu | Vanuatu | Vanuatu | Vanuatu |
| Venezuela, RB | | | Venezuela, RB |
| Vietnam | | | Vietnam |
| Virgin Islands (U.S.) | | | |
| West Bank and Gaza | | | West Bank and Gaza |
| Yemen, Rep. | | | Yemen, Rep. |
| Zambia | | | Zambia |
| Zimbabwe | Zimbabwe | Zimbabwe | Zimbabwe |

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