Views on the development of UNFCCC roadmaps for a Transition Away from Fossil Fuels in a Just, Orderly and Equitable Manner, and for Halting and Reversing Deforestation and Forest Degradation by 2030

31 March 2026

GAIA proposes the following material economy shifts as solutions for the roadmaps to deliver a *Transition Away from Fossil Fuels in a Just, Orderly and Equitable Manner*, as well as *Halting and Reversing Deforestation and Forest Degradation by 2030*:

- solutions to shift the material economy from single-use to reuse:
  - a declining cap on plastic production;
  - removing plastic polymer production subsidies;
  - deploying reuse and refill systems;
- and, ending the burning of biomass and waste.

1. Shifting the material economy: from single-use to reuse

A critical barrier preventing a transition away from fossil fuels and deforestation: the single-use economy

Single-use plastics drive fossil fuel demand: The fossil fuels industry is investing heavily in plastics to grow and compensate projected reduced demand for fossil energy. Petrochemicals dominate current growth in oil demand, for manufacturing of plastics including synthetic fiber.[1] Packaging is currently the largest share of plastic production (40%), dominated by single-use plastic packaging. Other single-use plastic items (e.g. bags, cutlery, foodware and other) also form a significant share of plastic production.[2]

Plastics hinder transition away from fossil fuels: The plastics sector is hindering a transition away from fossil fuels, in the following ways:

- through continued dependence on fossil-based feedstocks, as well as fossil-based plastic additives, and fossil-powered chemical processing to manufacture plastic polymers;
- by consuming substantial public subsidies - an estimated $80 billion globally in 2024 -, rendering plastics artificially cheap and harder to substitute with fossil-free alternative materials;[3]

[1] International Energy Agency 2025, Oil 2025: Analysis and forecast to 2030
[2] Break Free From Plastic & Global Plastics Policy Centre (2024) Making reuse a reality
[3] QUNO & Eunomia (2025) Plastic Money: Turning Off the Subsidies Tap Phase 1; Phase 2; Phase 3

- because single-use plastics support global supply chains relying on fossil-fuelled long-distance transportation and undercut local economies founded on reuse and low-fossil or fossil-free logistics;[4]
- by opposing policies intended to curb plastic production, consumption or use, including in the plastic treaty negotiations;[5]
- by blocking voting in global environmental diplomacy, in preventing the adoption of strong global obligations.[6]

Bio-based plastics drive fossil fuel demand, deforestation: While a shift from fossil to bio-based plastics might superficially appear to remove fossil-fuel dependency, a deeper look reveals that bio-based plastics are also dependent on fossil fuels and deforestation:

- Bio-based plastics overwhelmingly derive their feedstocks from fossil-fuelled industrial agriculture that causes deforestation, and fossil-powered chemical processing;[7]
- The climate footprint of biobased plastics can be considerable once full lifecycle impacts are accounted for, especially deforestation impacts; these can occur both directly and through indirect land use change, for instance when biomass cultivation leads to the loss of pasture lands which itself leads to rainforest clearance for new cattle pastures;
- Existing lifecycle analyses of fossil and biobased plastics have methodologies that are too inconsistent to claim that one is better for the climate than the other.[8]

Paper industry opposes reuse, drives deforestation: Paper packaging is the largest packaging waste stream in several regions including Europe.[9] Paper is often problematic for food packaging in particular because it is usually combined with plastic or chemical coatings, rarely includes recycled content and usually is not successfully recycled into new packaging - meaning that large amounts of primary paper are continuously needed, creating sustained deforestation pressures.[10] On average, three billion trees a year are cut for global paper packaging.[11]

Like other sectors of the material economy committed to single-use products and packaging, the paper industry has created obstacles to the transition away from fossil fuels and deforestation:

- Large packaging polluters including large fast food chains and single-use paper producers, conducted a broad lobbying campaign to greenwash throwaway paper as a sustainable alternative to single-use plastics and reuse;[12]

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[4] Zero Waste Europe (2020) Reuse vs. Single-Use Packaging: A Review of Environmental Impacts
[5] CIEL (2025) Fossil Fuel and Petrochemical Lobbyists Overrun Plastics Treaty Negotiations; Changing Markets (2020) Talking Trash: the corporate playbook of false solutions to the plastic crisis
[6] GAIA (2025) Pathways to an effective plastics treaty
[7] Gerassimidou et al. (2021) "Development of an integrated sustainability matrix to depict challenges and trade-offs of introducing bio-based plastics in the food packaging value chain" *Journal of Cleaner Production*
[8] Walker & Rothman (2020) Life cycle assessment of bio-based and fossil-based plastic: A review
[9] Eurostat (2025) Packaging waste statistics
[10] European Environmental Bureau et al. (2023) Prevention and reuse - the only solution to record levels of packaging waste
[11] FERN & EPN (2023) Unwrapping a disaster: The human cost of overpackaging
[12] European Environmental Bureau et al. (2023) Prevention and reuse - the only solution to record levels of packaging waste

- The Confederation of European Paper Industries has opposed mandatory and broad reuse targets in the EU's Packaging and Packaging Waste Regulation.[13]

In sum, shifting from single-use fossil-based plastics to single-use bio-based plastics or single-use paper merely displaces harms but does not reduce them overall. The single-use economy is fundamentally tied to fossil fuels and deforestation, and a transition away from these requires a shift away from the single-use economy.

Levers to accelerate transition

Lever 1: Declining cap on plastic production

A legally-binding and declining cap on plastic production would send an immediate signal that future investments in the petrochemicals sector will constitute stranded assets, thus averting the buildout of this highly fossil-fuel-dependent sector. A rapid decline over time will limit the sector's consumption of fossil fuels and emissions. Since plastic-producing countries are unlikely to adopt this roadmap, plastic-importing countries should complement the cap with trade provisions that limit their plastic imports. Finally, considering that bio-based plastics also drive fossil fuel demand and deforestation as shown above, it is critical that the phasedown applies to all plastics, irrespective of feedstock origin.

Instruments: Specific instruments that make up this lever include:

- Declining cap on synthetic polymer production;
- Quantitative restrictions on plastic imports (resin or products);
- Transparency on production and trade of primary plastics;
- Prohibitions on single-use plastics and other drivers of plastic demand;
- Moratorium on new or additional petrochemical buildout;
- Dedicated financial mechanism prioritizing support for compliance and implementation of Global South countries.[14]

Timeline: Milestones should be annual to allow for a managed decline in production over time and the growth of new businesses to replace plastic. To avoid breaching the 1.5°C limit set by the Paris Agreement, primary plastic production must decrease by at least 12% to 17% per year, starting in 2024.[15]

Best practice, lessons learnt: The flexibility afforded by differentiated phasedown schedules is widely credited for the success of the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer (Montreal Protocol), and can be applied to a declining cap on plastic production. The Montreal Protocol does not only provide developing country Parties with more time, but also with more funds. Their access to the Montreal Protocol's Multilateral Fund is contingent on the submission and approval of clear, actionable phaseout plans for ozone-depleting substances. This approach achieves compliance through financing, and shows the importance of defining means of implementation based on specific control measures and

[13] CEPI (2023) Press release: Legislating on packaging and waste, the EU Parliament still needs to take into account what has already been achieved in the paper and board sector
[14] For more, see GAIA (2025) INC-5 Booklet
[15] For more, see GAIA (2024) Plastic production reduction: the climate imperative

related implementation challenges.[16]

Gender, human rights: Plastic harms human health, aside from the climate. Plastics contain 16,000 different chemicals, with at least 4,200 (26%) being highly hazardous.[17] These include endocrine disruptors which disproportionately harm women and children and violate the fundamental universal human right to a safe, clean and healthy environment (UNGA Resolution 76/300), as well as the human right to health.

Lever 2: Removing plastic polymer production subsidies

The removal of plastic polymer production subsidies is an instrument supporting a declining cap on plastic production, but is complex enough to be considered as a lever in its own right.

Subsidies for energy and feedstocks used in petrochemical facilities, tax breaks, preferential financing and other government support measures are key drivers of expanding plastic production. These direct and indirect subsidies incentivize continued growth in virgin plastic production, artificially lower costs, making plastics cheap and create market distortions that disadvantage reuse systems and safer alternatives.

Removing these subsidies would help shift markets away from the plastics economy and align production with environmental and public health goals. This would not be a novel approach since the Kunming Montreal Global Biodiversity Framework already includes commitments to phase out certain forms of subsidies that harm biodiversity.

Instruments: Specific instruments that make up this lever include national and international regulatory and fiscal measures to phase out direct and indirect subsidies for plastic polymer production including:

- Capital-related supports such as grants and preferential financing;
- Feedstock support including government price-setting and tax breaks
- Process energy support including government price-setting or tax breaks for fuels or electricity used by petrochemical facilities;
- In-kind and other subsidies for other inputs into plastic polymer production including water, land and labor for facilities, as well as technical knowledge;
- Import tariffs on competing products.[18]

Timeline: The removal of plastic polymer production subsidies should be scheduled in parallel to a declining cap on plastic production.

Flexibility, best practice and lessons learned: Insights may be gained from the experience to date with fossil fuel subsidy removal, including:

- favouring a gradual approach, allowing some flexibility for countries with higher dependency or different levels of economic development (drawing on Nigeria's experience);[19]

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[16] GAIA (2025) Pathways to an effective plastics treaty

[17] Wagner, Monclús, Arp, Groh, Løseth, Muncke, Wang, Wolf & Zimmermann (2024) State of the science on plastic chemicals – Identifying and addressing chemicals and polymers of concern

[18] QUNO & Eunomia (2025) Plastic Money: Turning Off the Subsidies Tap Phase 1; Phase 2; Phase 3

[19] Onyeiwu (2024) Nigeria's fuel subsidy removal was too sudden: why a gradual approach would have been better, *The Conversation*

- at the same time, avoiding wholesale delays in subsidy removal, which can be motivated by policymaker underestimation of long-term gains (drawing on Iran's experience);[20]
- building sufficient political support across different sectors of society (drawing on Indonesia's experience).[21]

Lever 3: Deploying reuse and refill systems

Establishing, financing and scaling reuse systems, products and packaging can displace the single-use economy and its dependence on fossil fuels and deforestation. The deployment of reuse and refill also has multiple other climate benefits.[22]

Instruments: Specific instruments that make up this lever include:

- binding reuse and return rate targets;
- financial incentives for reuse systems including reusable packaging and associated washing infrastructure;
- harmonized definitions and standards to ensure health and safety and maximize reuse system inter-operability,[23] while allowing systems to be tailored for success in local contexts.[24]

Timeline: The timeline for deployment of reuse systems can range from under a year to five years, depending on their scale and complexity.

Flexibility: Flexibility for Global South countries could be considered by emphasizing the importance to customize reuse and refill systems to national contexts, rather than imposing infrastructure, processes and formats developed in other regions.[25]

Best practice, lessons learned: Existing systems in Asia (China, Hong Kong, India, Pakistan, Bangladesh, the Philippines, Indonesia, Vietnam, Thailand) have already surfaced the following lessons for the successful deployment and scaling of reuse and refill:

- *Beyond material reusability*: effective reuse systems require more than reusable packaging materials; they demand robust infrastructure and processes to ensure packaging can be reused multiple times for the same purpose;
- *Supply chain collaboration*: the success of reuse systems hinges on coordinated efforts across the entire supply chain; collaboration ensures efficient operations and enables a just transition, allowing all stakeholders to adapt and integrate equitably;
- *Context-specific solutions*: reuse systems like return and refill must be tailored to fit local contexts; customized approaches ensure higher adoption rates and greater impact within communities.

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[20] Aryanpur, Ghahremani, Mamipour, Fattahi, Ó Gallachóir, Bazilian & Glynn (2022) Ex-post analysis of energy subsidy removal through integrated energy systems modelling, *Renewable and Sustainable Energy Reviews*
[21] Jazuli, Roll, & Mulugetta (2026) A discourse analysis of fuel subsidy reduction: revisiting the political economy of Indonesia's experiences 1998–2019, *Humanities and Social Science Communications*
[22] For more on reuse and the climate, see Upstream: Climate, plastics & reuse (resources toolkit)
[23] For more, see Break Free From Plastic & Global Plastics Policy Centre (2024) Making reuse a reality
[24] GAIA (2024) Unpacking Reuse in Asia
[25] GAIA (2024) Life Before Plastic: Demonstrating Traditional Practices of Reuse in Africa

- *Policy support*: establishing ambitious targets for return and refill systems is critical; policies must also prioritize the development of supportive infrastructure and secure financing to enable these systems to scale effectively;[26]
- *Green jobs for a just transition:* reuse and refill systems can be leveraged to create green jobs for waste pickers to ensure a just transition away from fossil fuels and deforestation.[27]

2. Shifting the material economy: ending biomass and waste burning

Critical barriers preventing a transition away from fossil fuels and deforestation

The false green promises of the burn economy: Many countries have turned to forest biomass as an alternative source of heat and electricity in an effort to reduce their dependency on fossil fuels. Likewise, waste-to-energy incineration, including the burning of waste as fuel in cement kilns and other industrial boilers, has earned greater support. The false green credentials of biomass and waste burning are due in large part to the fiction that biomass energy is carbon neutral,[28] supported by the subversion of the IPCC guidelines against the double counting of biogenic carbon emissions, allowing waste burning companies to under-report their actual carbon emissions by 50% or more.[29]

Both approaches, however, are carbon-intensive, pollution-intensive and rely on over-extraction of biomass and material overproduction. Biomass burning is predicated upon deforestation, while waste burning is structurally dependent upon a linear extractive economy that overproduces materials and violates planetary boundaries and human rights alike. Refuse Derived Fuel (RDF) Process Engineered Fuel (PEF) or Solid Recovered Fuel (SRF) for co-incineration in cement kilns and other industrial burners is made up from residual municipal waste, commercial and industrial waste, construction and demolition waste, as well as agriculture and forestry biomass waste, and this waste burning undercuts attempts to reduce such waste, reuse or recycle it in less polluting ways, including the use of biomass waste for mulching, or composting. Waste-to-energy incinerators also emit more greenhouse gases per unit of electricity produced than any other power source.[30]

The biomass and waste burning sector have obstructed transitions away from deforestation and fossil fuels in the following manners:

- for biomass burning:
    - by clearcutting forests including old-growth, primary forests, for the production of wood pellets burned for heat or energy; and encouraging the expansion of monoculture tree plantations, which are biodiversity deserts;
    - by draining billions of taxpayer dollars in biomass energy subsidies away from genuine renewable energy sources and residential energy efficiency retrofits that lessens

[26] GAIA (2024) Unpacking Reuse in Asia
[27] Hassanand, Joshi & Narayan (2025) Just Reuse: the waste picker perspective on reuse
[28] Environmental Paper Network (2026) How UNFCCC carbon accounting has created a biomass delusion and is contributing to climate change and global inequity
[29] Tangri (2026) Rigging the Numbers: Questions and Answers on Biogenic Carbon in Waste and Climate Change, *GAIA*
[30] Tangri (2023) Waste incinerators undermine clean energy goals, *PLOS Climate*

household dependency on fossil fuels; a handful of major economies spent nearly $250 billion on biomass subsidies between 2002 and 2024;[31]
    - By enabling the so-called "abatement of coal" through co-firing with biomass, which falsely allows claims of emissions reductions, while prolonging the life of dirty coal fired power stations which would otherwise be shut down.[32]
- for waste burning:
    - by locking-in material overproduction, much of which is fossil-powered or fossil-based, in order to guarantee a steady stream of material to keep burning;
    - by undercutting reuse, repair and recycling across all material streams through the logic of mixed waste burning, at odds with the source separation and sorting that is needed for both reuse and recycling;
    - by burning a large amount of biomass, including paper, cardboard and timber scrap, mixed with plastics and other wastes, in the form of Refuse Derived Fuel (RDF) and its analogs in cement kilns and other smokestack industries.[33]

A lever to accelerate transition: Ending biomass and waste burning

Instruments: Specific instruments that make up this lever include:

- prohibiting waste burning, including Refuse Derived Fuel (RDF) and its analogs such as Process Engineered Fuel (PEF) or Solid Recovered Fuel (SRF);
- prohibiting industrial-scale biomass burning, including the burning of wood pellets in coal-fired facilities;
- removing biomass and waste burning from renewable/clean energy standards and climate targets;
- ending the consideration of co-firing woody biomass, waste or RDF (PEF, SRF) with coal as abatement of fossil fuel emissions;
- removing biomass energy and waste burning subsidies;
- excluding biomass energy and waste burning from green finance criteria;[34]
- requiring the full accounting of biogenic carbon emissions from burn facilities;
- rectifying biomass carbon accounting rules under UNFCCC and related IPCC reporting methodologies.[35]

[31] Environmental Paper Network (2025) Burning Billions for Biomass: The case for cutting subsidies, not forests
[32] Environmental Paper Network (2025) RE100 Raises Bar for Renewable Energy, Calls for Global Shift Away from Co-firing Coal with Biomass
[33] Toxics-Free Australia & IPEN (2024) Refuse Derived Fuel in Australia: Burning Hazardous Plastic Waste
[34] Environmental Paper Network (2025) Burning Billions for Biomass: The case for cutting subsidies, not forests
[35] Environmental Paper Network (2024) Burning Up the Biosphere:

Acknowledgements

This submission was authored by Sirine Rached and reviewed by Neil Tangri and Ana Rocha (GAIA). Contributors include Ambily Adithyan, Merrisa Naidoo (GAIA) and Sophie Bastable (Environmental Paper Network).

GAIA is a global network of grassroots groups and national and regional alliances representing more than 1000 organizations from 92 countries. We envision a just, zero waste world built on respect for ecological limits and community rights, where people are free from the burden of toxic pollution, and resources are sustainably conserved, not burned or dumped. We work to catalyze a global shift towards environmental justice by strengthening grassroots social movements that advance solutions to waste and pollution.