

Material Substitutes to plastics and multilateral processes

Henrique Pacini

United Nations Conference on Trade and Development (UNCTAD)



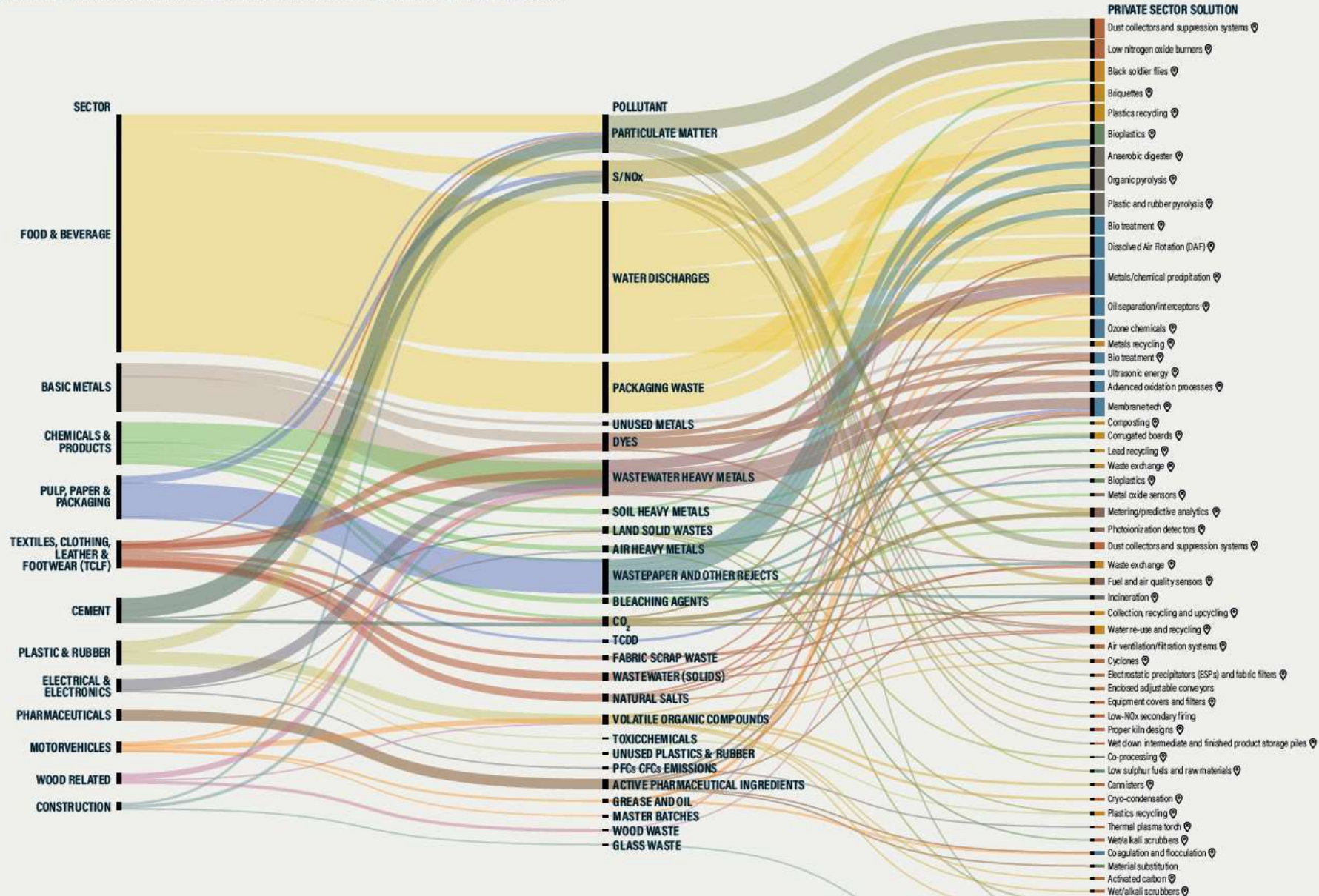




Lets discuss: circularity sectors

- Agriculture
- Tourism
- Housing/Construction
- Electronics
- Water systems
- Energy
- Transportation
- Mining

POLLUTION FROM MANUFACTURING IN KENYA AND UGANDA AND POTENTIAL PRIVATE RESPONSES



Secondary (used/scrap) materials:

Waste containers	Prices		
	Raw material	Purchase	Secondary material
Iron	18.18	7.76	9.44
Aluminum	70.02	36.67	60.25
Glass	— ^b	0.55	1.00
PET	34.67	11.70	25.70
PVC	26.35	0.00	0.00
PP	34.16	13.60	20.10
PE	31.71	20.20	25.40
PS	40.15	7.60	10.90
EPS	40.15	24.00	25.00
Paper	26.08	5.25	2.11



Often cheaper, but available in small, decentralized scales

^a Raw material prices are collected from market survey, while purchase prices and secondary material prices are estimates from sampling survey in May 2019.

^b Data are not available.





Multilateral Processes



Negotiating Committee for a Global Treaty against Plastic Pollution (INC); WTO Dialogue on Plastic Pollution; Basel Convention, WHO One Health Initiative.
















Some key ongoing processes

- WTO
 - Dialogue on plastic pollution
 - Trade and Environment Sustainability Structured Discussions
- UN
 - Intergovernmental Negotiating Committee for an internationally binding instrument against plastic pollution (INC)
 - Basel, Rotterdam and Stockholm Conventions
 - Amendments on waste plastics trade (2019)
 - Amendments on e-waste (2025)

Multilateral Environmental Agreements

Environmental agreements

From sources across the web

-  Convention on Biological Diversity ▼
-  Convention on the Conservation of Migratory Species of Wild Animals ▼
-  Cartagena Protocol on Biosafety ▼
-  Stockholm Convention ▼
-  United Nations Convention on the Law of the Sea ▼
-  Basel Convention ▼
-  CITES ▼
-  Paris Agreement ▼
-  Kyoto Protocol ▼
-  Convention On Biological Diversity ▼
-  Minamata Convention on Mercury ▼
-  Ramsar Convention ▼
-  United Nations Framework Convention on Climate Change ▼
-  Montreal Protocol ▼
-  International Tropical Timber Agreement ▼

Show less ^

Feedback



UNITED NATIONS
UNCTAD

The distinction between plastic substitutes and plastic alternatives

Plastics substitutes are natural materials that have similar properties to plastics, while plastic alternatives include bioplastics or biodegradable plastics.

Plastic substitutes

Mineral, plant, marine or animal

Recyclable, reusable, biodegradable, compostable, or erodable

Should have lower environmental impact along their life cycle

Should not be hazardous for human, animal or plant life

Non-plastics

VS

Plastic alternatives

ORIGIN

Bioplastics or Biodegradable plastics

PROPERTIES

Recyclable, biodegradable, or compostable (end of life)

IMPACT

Should have lower GHG lifecycle emissions when compared to plastics

SAFETY

Should not be hazardous for human, animal or plant life

Better plastics



Source: UNCTAD Vivas Eugui & Pacini (2022). UNCTAD, based on presentation on plastic substitutes HS codes, Life-cycle analysis and tariffs considerations. WTO Dialogue on Plastics.






Sustainable
Manufacturing and
Environmental
Pollution
Programme



HS Chapter	Description	Number of 6-digit HS Codes
04	Dairy produce; birds' eggs; natural honey; edible products of animal origin, n.e.c.	1
05	Animal originated products; not elsewhere specified or included	3
07	Vegetables and certain roots and tubers; edible	8
08	Fruit and nuts, edible; peel of citrus fruit or melons	2
11	Products of the milling industry; malt; starches; inulin; wheat gluten	3
12	Oil seeds and oleaginous fruits, ..., industrial or medicinal plants; straw and fodder	7
13	Lac; gums, resins and other vegetable saps and extracts	4
14	Vegetable plaiting materials; vegetable products not elsewhere specified or included	4
15	Vegetable waxes (other than triglycerides); whether or not refined*	1
17	Sugars and sugar confectionery	2
20	Preparations of vegetables, fruit, nuts or other parts of plants	1
23	Food industries, residues and wastes thereof; prepared animal fodder	4
28	Inorganic chemicals; organic and inorganic compounds of precious metals...	2
29	Organic chemicals	2
32	Glass; glass frit and other glass, in the form of powder, granules or flakes*	1
39	Cellulose; Natural polymers...	5
40	Rubber	4
41	Raw hides and skins (other than furskins) and leather	12
42	Articles of leather,....articles of animal gut (other than silkworm gut)	1
44	Wood and articles of wood; wood charcoal	43
45	Cork and articles of cork	7
46	Manufactures of straw, esparto or other plaiting materials; basketware...	8
47	Pulp of wood or other fibrous cellulosic material; recovered (waste and scrap)...	17
48	Paper and paperboard; articles of paper pulp, of paper or paperboard	31
50	Silk	10
51	Wool, fine or coarse animal hair; horsehair yarn and woven fabric	25
52	Cotton	3
53	Vegetable textile fibers; paper yarn and woven fabrics of paper yarn	19
54	Man-made filaments; strip and the like of man-made textile materials	4
56	Wadding, felt and nonwovens, special yarns; twine, cordage, ropes and cables...	4
57	Carpets and other textile floor coverings	1
63	Textiles, made up articles; sets; worn clothing and worn textile articles; rags	2
67	Feathers and down, prepared; and articles made of feather or of down	1
68	Stone, plaster, cement, asbestos, mica or similar materials; articles thereof	1
69	Ceramic products	4
70	Glass and glassware	9
76	Aluminium and articles thereof	17
94	Furniture,.... not elsewhere specified or included	4
95	Toys, games and sports requisites; parts and accessories thereof	4
96	Miscellaneous manufactured articles	1

Reducing plastic use is the best way to prevent it becoming waste or hazardous waste. Substitutes can contribute significantly to this aim. A mapping of Harmonised System codes of potential plastic substitutes resulted in...

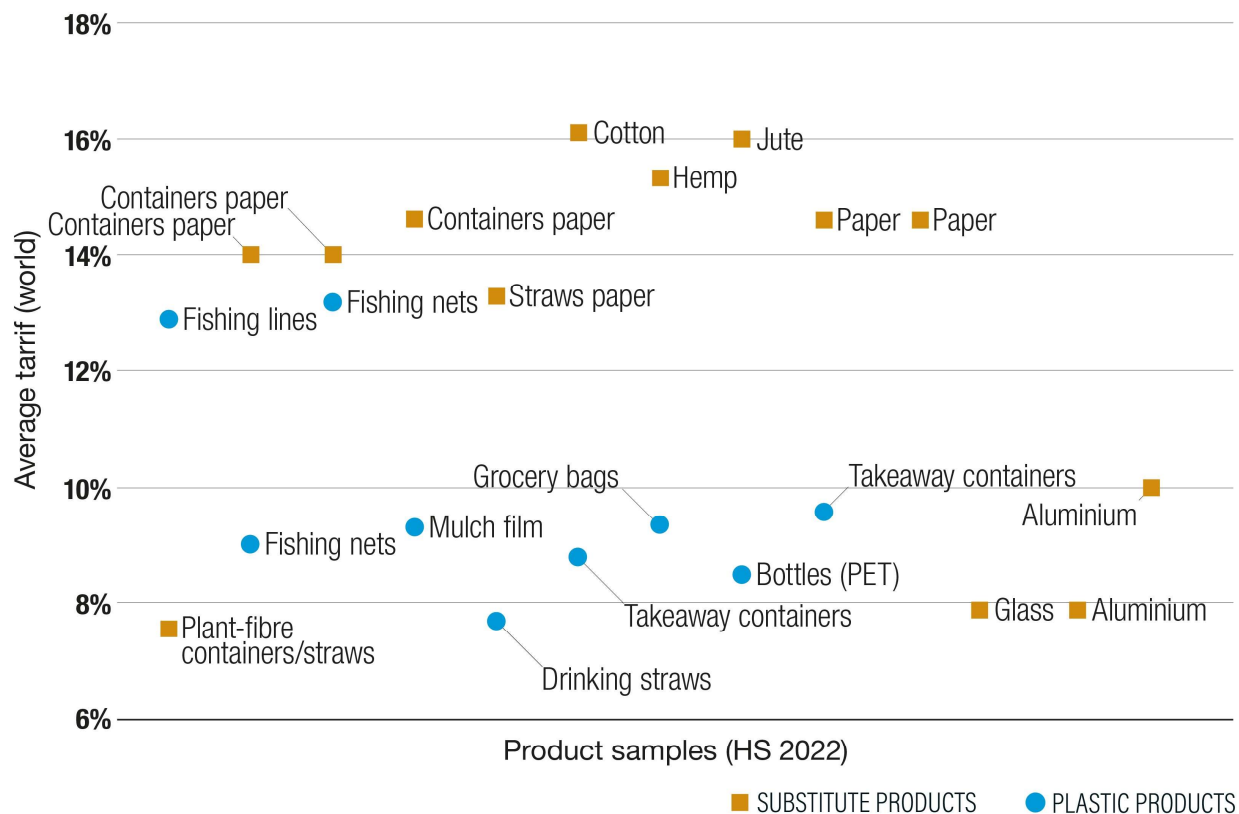
282 HS codes identified
(6-digit)



<https://unctad.org/publication/plastic-pollution-pressing-case-natural-and-environmentally-friendly-substitutes>

Average import tariffs on plastic products vs material substitutes

Substitutes often face higher import tariffs than their plastic equivalents.



Important to promote more policy coherence in tariff schedules vis-à-vis potential control measures and incentives

Source: UNCTAD, based on OEC data 2020 and HS 2022 codes.

Note: Aluminium, paper, container paper and fishing nets are repeated because of different items represented in different HS codes.

CHALLENGES AND OPPORTUNITIES FOR SINGLE-USE PLASTIC SUBSTITUTES

INSIGHTS FROM KENYA

PLASTIC WASTE MANAGEMENT IS A GROWING CHALLENGE IN KENYA

- Plastic constitutes an estimated 10–12% of solid waste, amounting to 966,000 tonnes/year.
- Plastic beverage bottles accounted for the largest share (13.26%) of all items collected from beaches in 2019, followed by plastic bottle caps (10.5%). Other items collected in large shares included food wrappers, plastic lids and plastic takeaway containers, and plastic grocery bags.

– Plastic packaging is used at a rate of 259,252 tonnes/year, of which 71% is imported. The end-of-life scenario for plastic packaging waste leaves 15% landfilled, 18% recycled and 67% disposed in open dumps. As of 2018, only 27% of all plastic waste generated was collected, of which 19% was landfilled and 8% recycled. A small percentage (13.6%) of the plastic waste collected for recycling was exported.

IMPACTS PER LIFE CYCLE STAGE OF ALTERNATIVE BAG TYPES



WHAT DO LIFE-CYCLE AND TECHNO-ECONOMIC ANALYSES REVEAL?

A screening life-cycle assessment of various feedstocks was carried out for four product categories: (i) plastic grocery and other bags; (ii) takeout/takeaway containers for food and beverages; (iii) plates, straws and cutlery; and (iv) bottles and sachets for water and other beverages. Results for grocery bags are illustrated in the figure beside. After further techno-economic

Pros and cons of material substitution

- http://bit.ly/SMEP_UNCTAD

Substitution: swapping products for services

- Instead of:



Which delivery modality pollutes less?

Zero Draft text INC-3 on Non- plastic substitutes (Art.6)

- To take measures to foster innovation and incentivize and promote the development and use at scale of **safe, environmentally sound, and sustainable** non-plastic substitutes, including **products, technologies and services**, considering their potential for environmental, economic, social and human health impacts.
- To encourage the use of **regulatory and economic instruments, public procurement and incentives** to promote the development and use of **safe, environmentally sound and sustainable** non-plastic substitutes.

WTO IDP on Non- plastic substitutes (draft WTO/W10)

- **Promote trade**, including through implementing trade-related measures such as those listed in Annex [X], that **contributes to ending plastic pollution and results in safe circularity**, including trade in:
 - **environmentally sustainable, safe, and effective** non-plastic substitutes and
 - **environmentally sustainable, safe, and effective** plastic alternatives and re-use, repair and
 - **re-fill systems** such as those listed in Annex [X],

With a focus on those of interest to WTO Members, in particular developing members, including **SIDS, and least developed members, and opportunities for their MSMEs.**

CONTROL AND MITIGATION MEASURES ACROSS EACH STAGE OF THE PLASTICS VALUE CHAIN

Control measures applicable to plastics are being discussed as one of the main **tools for a legally binding instrument on plastic pollution**, including in the marine environment. This table summarizes several options, **covering both trade / border measures and internal market measures**, which can be adopted by countries. Control measures can help steer economies away from harmful, problematic, single-use plastics and at the same time help to promote more sustainable material substitutes and alternatives.

RAW MATERIALS



Hydrocarbons

UPSTREAM



Polymer pellets

MIDSTREAM



Products and parts

DOWNSTREAM



Plastic waste or residues

RECOVERY



From land or water bodies

		RAW MATERIALS	UPSTREAM	MIDSTREAM	DOWNSTREAM	RECOVERY
TRADE / BORDER MEASURES	TARIFFS	• Preferential or higher tariffs on certain goods.	×	×	×	×
	IMPORT BAN (QR)	• Import ban on imports of single-use plastics causing persistent pollution.			×	×
	IMPORT QUOTAS (QR)	• Limitations on imports of single-use plastics.	×	×	×	×
	IMPORT LICENSES (ILP)	• Import licenses for recyclable plastic waste; • Import licenses for plastic bag components to avoid circumventing.		×	×	×
	EXPORT BAN	• Export ban of polymers, products or scrap material to destinations with limited capacity to process end-of-life materials.		×	×	×
	EXPORT QUOTAS	• Limits on specific polymer or scrap material exports.		×		×
	EXPORT LICENSES	• Adherence to Basel plastic waste amendments / PIC procedure.				×
	EXPORT TAXES	• Explicit tax or via state marketing boards.				×
	TRADE DEFENSE TOOLS	• AD/CVD applied to plastics; • Peace clause so not to apply AD/CVD on material substitutes.	×	×	×	×

CONTROL AND MITIGATION MEASURES ACROSS EACH STAGE OF THE PLASTICS VALUE CHAIN

Control measures applicable to plastics are being discussed as one of the main tools for a legally binding instrument on plastic pollution , including in the marine environment. This table summarizes several options, covering both trade / border measures and internal market measures , which can be adopted by countries. Control measures can help steer economies away from harmful, problematic, single-use plastics and at the same time help to promote more sustainable material substitutes and alternatives.		RAW MATERIALS Hydrocarbons	UPSTREAM Polymer pellets	MIDSTREAM Products and parts	DOWNSTREAM Plastic waste or residues	RECOVERY From land or water bodies
INTERNAL MARKET MEASURES	MONETARY AND ECONOMIC INSTRUMENTS • Environmental or chemical taxes applicable to plastics; • Packaging and recycling fees; • Preferential tax treatment to alternatives/substitutes.	×	×	×	×	×
	PUBLIC PROCUREMENT -not including public hydrocarbon enterprises- • Government procurement favouring goods with recycled content; • Procurement of plastic depollution services.			×		×
	SUBSIDIES TO SERVICES • Direct grants to R&D; • Subsidies for recycling or decontamination services imports.	×	×		×	×
	REMOVAL OF SUBSIDIES TO GOODS • Removal of subsidies to fossil fuels; • Remove subsidies from polymer pellets.	×	×			
	OPERATION LICENSES • Authorize operation for polymer production or recycling/recovery services of sufficient quality.	×	×	×	×	×
	LABELLING (TBT) • Labelling requirements clearly indicating polymer and recycled content; • Proper labelling requirements of recycled plastic scrap trimmings or pellets.		×	×	×	
	INVESTMENT REGULATIONS • Authorize operation for polymer production or recycling/recovery services of sufficient quality.	×	×		×	×
	SERVICES LIBERALIZATION & REGULATION • Plastics decontamination services liberalization; • National plastic waste management frameworks.					×
	EXTENDED PRODUCER RESPONSIBILITY • Deposit schemes; • Take-back programmes.				×	
	DESIGN AND QUALITY STANDARDS (TBT) • Exclusion of any hazardous chemicals; • Minimum thickness, reusability, mono-material requirements; • Durability.	×	×	×	×	
	INTERNAL PRODUCTION AND COMMERCIALIZATION BANS OF PLASTIC PRODUCTS			×	×	
	CERTIFICATION AND CONFORMITY ASSESSMENT (SPS/TBT)		×	×		
	RECYCLING TARGETS (ADM)				×	×
MEASURING, MONITORING AND MAPPING OF PLASTIC LITTER (ADM)				×	×	