UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT

Leaving the shore: Marine-based substitutes & alternatives to plastics

Pre INC event:
Navigating the materials spectrum

Division on International Trade and Commodities
UN Trade and Development (UNCTAD)

Background

- The **ocean** as a source of materials to tackle plastic pollution through substitution:

- **Marine-based substitutes and alternatives (MbSAs)** with **potential** for **replacing fossil fuel-based plastics (e.g., PE, PP, PET)**, either **directly** or **indirectly**:

▪ Seaweed and other algae ▪ Fish waste, ▪ Crustacean & mollusc shells and cuttlebones (e.g. waste from cultivation) ▪ Marine invertebrates (e.g. jellyfish)	▪ Biological polymers (e.g. alginates, agar-agar and carrageenan) ▪ Seaweed based PHA (polyhydroxyalkanoates) ▪ Marine minerals (e.g., silica sands, clays)

- **Natural polymers** — derived from seaweed and other marine species— **are not chemically modified** and integrate fully into natural cycles.

- **They are low natural resource intense, biodegradable/compostable or recyclable, good functionality** (*e.g., strength and flexibility*)**, with high innovation potential**

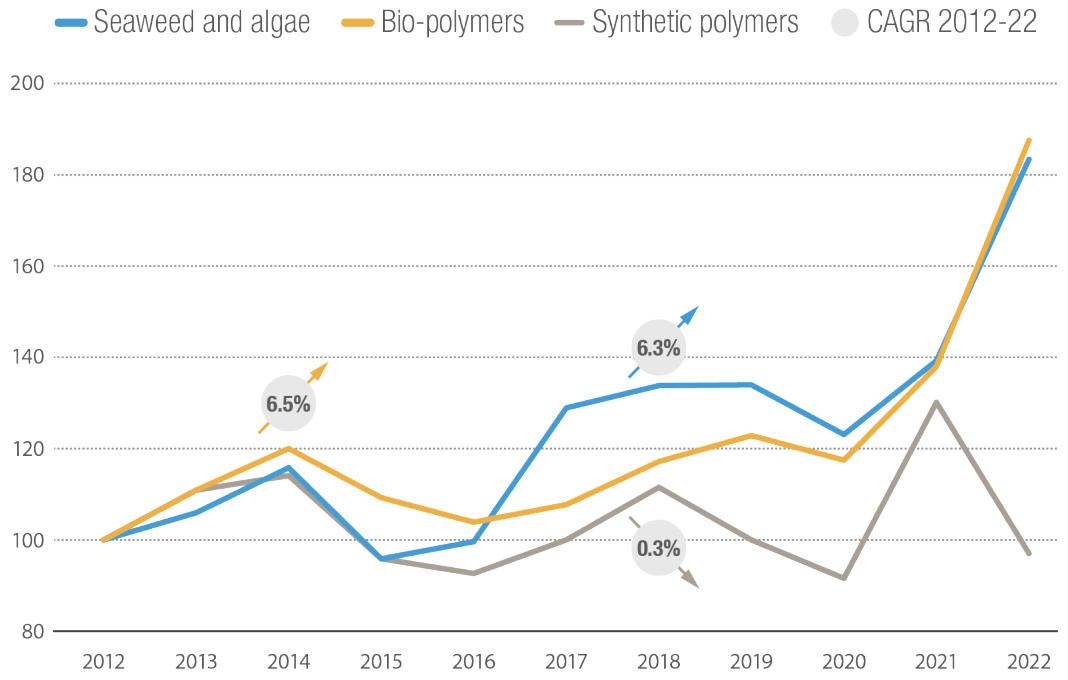
- **They have safely used for decades by both consumers and industry**

Trade trends

Global exports of MbSAs are still relatively small compared to global plastics exports

- Trade is an essential channel for diffusion & adoption outside production areas. All these products are listed under **+40 HS codes** and are routinely traded worldwide
- They were worth **$10.8 billion in 2022**
- **Exports** of algae-derived biopolymers (agar-agar, alginates, carrageenan) **have almost doubled** between 2012-2022, growing by **+87% at an annual average rate of 6.5%**

Global exports of marine biopolymers and seaweed vs. synthetic polymers

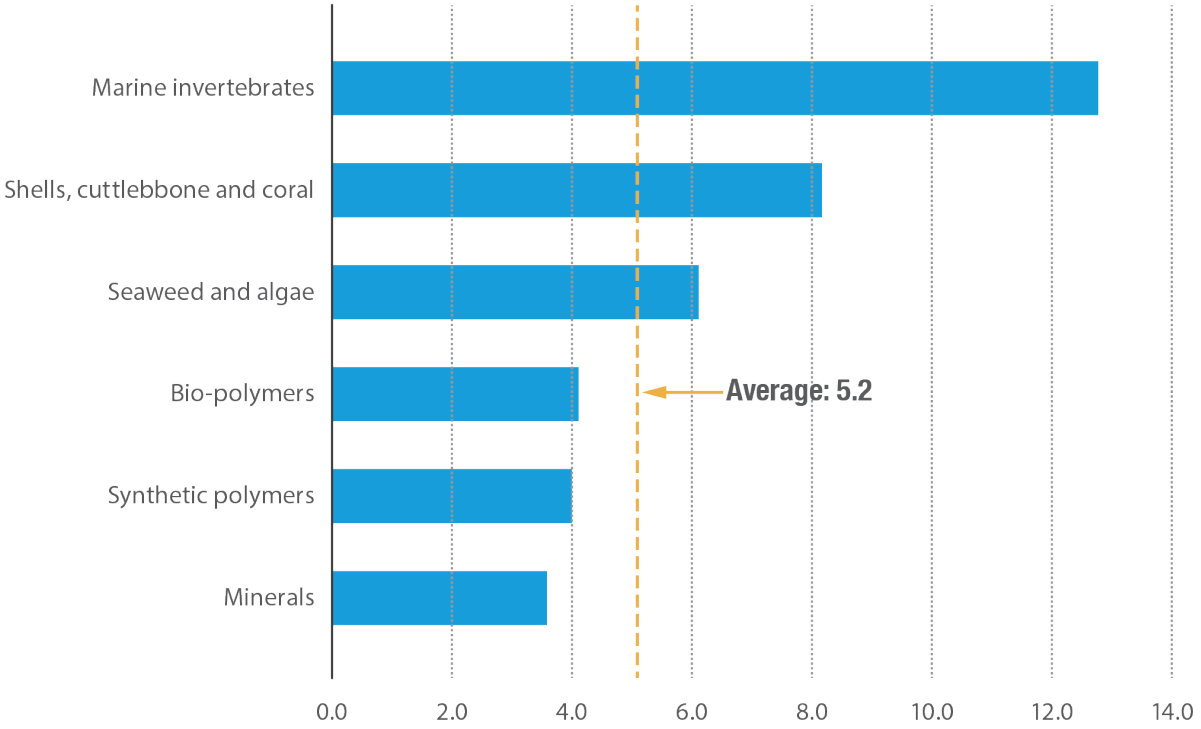


Source: UN Trade and Development.

Note: Base year: 2012=100. Bio-polymers include agar-agar, carrageenan and alginates.

Trade barriers

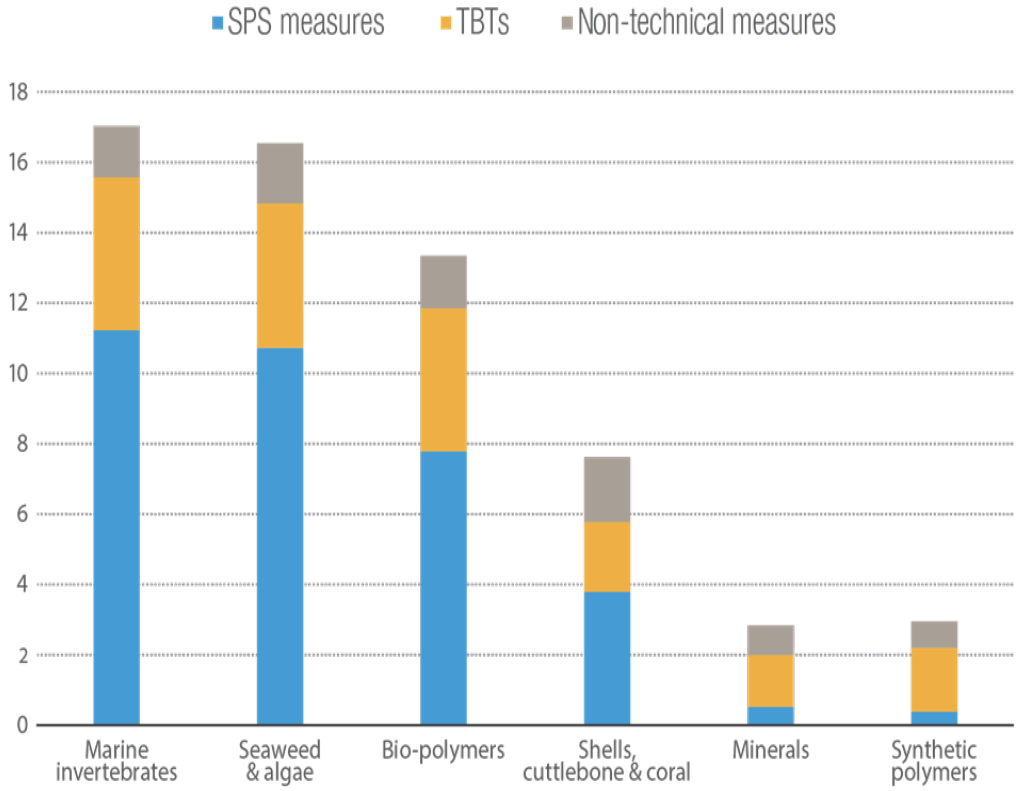
Average MFN tariffs applied to marine substitutes vs. synthetic polymers



Source: UN Trade and Development.

Notes: Does not include preferential rates applied as part of trade agreements (FTA, regional trade agreement, etc.)

Average NTMs applied to marine substitutes vs. synthetic polymers



Source: UN Trade and Development.

Global exports of MBSAs by development status of exporter (per cent)

Source: UN Trade and Development.

Lively entrepreneurial ecosystems: UNCTAD‘s MAPS expo (2025)

Seashell-derived tiles from South Korea. Credits: Newtab-22 studio

Sea glass made from microalgae-derived silica. Credits: Elisava

UNCTAD MAPS expo (2025.). Zero Circle seaweed-based coating and packing materials.

Vivomer (PHA-based) non fossil fuel plastic substitute, home compostable.

Algae-based garment made from locally sourced algae. Credits: Runa Ray, 2024

Seaweed fermentation to produce PHAs. Credits: Uluu, 2024

Thank you

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