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Innovative Community Engagement for Building Effective Resilience and Arctic Ocean Pollution-control Governance in the Context of Climate Change

Policies and legislation combating plastic pollution

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A policy paper prepared by the ICEBERG project, presenting background information on various elements relevant to pollution governance in the Arctic.

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Policies and Legislation for Combating Plastic Pollution

After the failure of the global plastics treaty negotiations, at least for the time being, the future of international plastic regulations is currently indeterminate. In the short to medium term, national and Arctic regional governance initiatives will remain the most important governance avenues for mitigating plastic pollution and will have to be further consolidated.

CURRENT GOVERNANCE - KEY ISSUES

• The Arctic region is over-proportionally affected by the negative consequences of marine plastic pollution. In the ICEBERG case study studies, environmental and human risks related to marine plastics can be assumed to continue increasing.

• After the (temporary) failure of the global plastics treaty negotiations, international regulation remains fragmented. Treaties such as the London Convention, the United Nations Law of the Sea Convention, the MARPOL 73/78 Annex V (a part of the Convention on Prevention of Pollution from Ships dealing with garbage), and the Polar Code only regulate isolated aspects of the disposal of plastics into the ocean.

• While recycling rates in the three case sites are still very low, some new national governance initiatives to combat plastic pollution have recently been initiated in Iceland, Svalbard, and, to a lesser degree, also in Greenland.

• Legally binding plastic regulations are complemented by mostly uncoordinated voluntary initiatives (in particular, beach clean-ups, as well as industry and governmental sustainable tourism guidelines).

THE MAIN GOVERNANCE GAPS

1. Governance of lost fishing gear – a major local source of marine litter - remains a major challenge in the ICEBERG case study sites: while Norway has adopted comprehensive, legally binding regulations, frameworks in Iceland and Greenland are more limited. Moreover, the implementation of existing regulations and its monitoring are often deficient.

2. The lack of legally binding regulations regarding the handling of plastics by cruise tourism can further increase the existing problems of Arctic plastic pollution.

3. In the light of the lack of a comprehensive international framework, enhanced regional expertise and institutional capacity will have to be built up to address existing international governance gaps along the whole cycle of plastic pollution.

EXAMPLES OF GOOD PRACTICE

1. The Arctic Coastal Cleanup, overseen by the Arctic Council Working Group PAME, can be considered a best practice due to its transnational and well-coordinated character.

2. Initiatives of the Arctic Council to address plastic pollution have gained momentum more recently. In particular, the 2021 Regional Action Plan (ML-RAP) might serve as a good practice example in this regard.

3. The AECO Clean Seas Project - aiming at the reduction of use of single-use plastics on cruise ships, and the education of passengers and staff about how to prevent plastic pollution - is an ambitious, albeit voluntary, example for increasing public sensitivity towards plastic pollution.

FURTHER READING & CONTACT

FULL REPORT: arctic-iceberg.eu/publications

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ICEBERG project

Climate change and pollution, including plastics, ship emissions and wastewater, pose threats to human health and the ecosystems of the Arctic region.

From 2024-2027, the ICEBERG project, funded by the EU under the Horizon Europe programme, studies pollution and its impacts on the ecosystems and communities in the European Arctic, focusing on three regions: southern Kalaallit Nunaat (Greenland), Northern Iceland and Svalbard.

The ICEBERG project integrates natural and social sciences with Indigenous and local knowledge. Researchers employ an ethical, multi-actor and gender-sensitive approach to assess the impacts, risks and vulnerabilities of local communities. The project applies the One Health approach, which recognises the interconnectedness and interdependence of the health of humans, animals, plants and entire ecosystems.

The aim is to mitigate the impacts of pollutants in the Arctic. The project investigates the sources, types and distribution of pollutants, such as plastics, ship emissions, wastewater and heavy metals, by using simulations, remote sensing and observations. On a practical level, the project develops, for example, automatic marine litter detection tools using drones, AI and citizen science. The toxicological impact of microplastics, nanoplastics and persistent organic pollutants (POPs) on human digestive health is being evaluated. The impact of pollution emissions on the marine food web is assessed.

Researchers work together with the communities and stakeholders to co-develop pollution monitoring, mitigation and adaptation strategies, as well as policy recommendations for multilevel pollution-control governance.

Policy papers

The series of policy papers outlines the main elements of the governance framework relevant to pollution control in the Arctic areas of the North Atlantic, with a focus on the three ICEBERG study sites.

Each paper starts with an introduction on the specific policy area or economic sector relevant for Arctic pollution governance, then proceeds to discuss national regulations in the three ICEBERG study sites, as well as to provide an overview of international law, European Union policies and legislation, Arctic Council actions and corporate governance. Governance gaps and selected best practices are presented.

The policy papers produced and published on the ICEBERG website are:

- Cruise tourism
- Solid waste & wastewater management
- Microplastics and plastics pollution
- Frameworks for Arctic beach clean-ups
- POPS and heavy metals
- Pollution related to mining activities

The policy paper does not constitute a formal deliverable of the ICEBERG project.

Table of Contents

Key insights:

- The Arctic region is over-proportionally affected by the negative consequences of marine plastic pollution. Marine macro- and micro-plastics are found along the coastlines, in sea-ice, the water column, marine biota and on the seafloor.
- While the presence of marine microplastics in the Arctic is confirmed, uncertainties about their exact accumulation remain, due to the lack of an environmental monitoring standard and a universal sampling protocol.
- The environmental and human risks related to marine plastics can be assumed to further increase in the case sites and across the Arctic.
- After the (temporary) failure of the global plastics treaty negotiations under the auspices of UNEP, the future of international plastic regulations is indeterminate. In the short to medium term, national as well as Arctic regional initiatives will become more important.
- Some new national governance initiatives to combat plastic pollution have recently been initiated in Iceland, Svalbard, and to a lesser degree, also in Greenland - complemented by enhanced voluntary initiatives (in particular beach clean-ups – see also policy paper on beach clean-ups + cruise operators' initiatives).

1. Introduction and background

Marine litter can be considered a major threat of increasing severity for the marine environment in the Arctic. Especially as the Arctic, today, is considered a global sink for anthropogenically derived particulates, including microplastics (Berry et al., 2023).

The United Nations Environment Program (UNEP) defines marine litter, interchangeably used with marine debris, as "any persistent, manufactured or processed solid material discarded, disposed of or abandoned in the marine and coastal environment. Marine litter consists of items that have been made or used by people and deliberately discarded into the sea or rivers or on beaches; brought indirectly to the sea with rivers, sewage, storm water or winds; accidentally lost, including material lost at sea in bad weather (fishing gear, cargo); or deliberately left by people on beaches and shores" (UNEP, 2021). The term also includes plastics and microplastics. Marine litter can enter the marine environment through various sources, both from land and the sea, originating from local and long-range sources. However, land-based sources of marine litter make up the majority and are transported via sewage or drainage systems, natural waterways, wind and through direct human littering. Marine-based sources comprise, for example, wastewater from shipping vessels, lost and abandoned fishing gear from fishing vessels, and also aquaculture facilities, offshore oil industries and tourism activities. For the Arctic region, oceanic currents are considered as major pathways followed by sea ice, riverine discharges, atmospheric transport through wind, snow and local anthropogenic activities (Ramasamy et al., 2021). Three major routes have been identified, which are: 1) the water current through the Bering Strait, connecting the Bering Sea to the Chukchi Sea, 2) the Fram Strait between Greenland and Svalbard connecting the Atlantic Ocean with the Arctic Ocean (Norwegian Sea), and 3) the North Atlantic Current, which splits into a second current and enters the Arctic between Svalbard and the Siberian coast (Ramasamy et al., 2021).

Marine plastics are generally categorised according to their size, with macro-plastics comprising the largest particles of marine debris (>20mm in diameter). Microplastics are defined as small particles below 5mm in diameter, and particles below 1000mm in diameter are defined as nano-plastics. Debris of all size categories is found throughout the marine environment, at beaches, on the water surface, in the water column and on the seafloor (Berry et al., 2023). In the Arctic, microplastics have been observed in sea ice, snow, surface and subsurface waters, and in Arctic biota (Ball and Halsall, 2023).

For example, about 150.000 to 500.000 tonnes of plastic waste and between 75.000 and 300.000 tonnes of microplastics enter the oceans every year, only from the European Union (EU Strategy for Plastics in a Circular Economy, 2018). These also end up in particularly vulnerable areas, such as the Arctic Ocean. Against this background, microplastic endangers the health and life of marine fauna but may also endanger benthic habitats. Moreover, bioaccumulation and biomagnification of toxins may occur (Wienrich, 2022: 20).

There are many challenges to effectively reducing, mitigating, and preventing marine plastic pollution, as all types of sources and pathways need to be considered and addressed. This requires to think globally, due to the transboundary impact and occurrence, to act on a very localized level across the globe to mitigate plastic pollution through strategies, such as the reduction of plastics use, the implementation of strategies to reduce production levels of plastics, the improvement of

waste management strategies, such as landfills, and to enhance wastewater treatment technology, for example.

However, on a local level, specifically in the Arctic, there are considerable challenges for the implementation of such strategies. For example, waste management in the Arctic is generally challenged by expensive infrastructure and transportation, poor economies of scale, as well as difficulties with the operation of waste management sites.

2. National/local governance

Cruise vessels waste (including plastics) is described in more detail in a separate policy paper ("Cruise Tourisms").

2.1. Greenland

In Greenland, responsibility for marine pollution management, including plastic pollution, is divided between different authorities. The government and municipalities deal with pollution along the coast and in Greenland`s territorial waters, which extend up to 3 nautical miles from the coast. Beyond the 3 nautical miles limit, in the Exclusive Economic Zone (up to 200 nautical miles), responsibility shifts to the head of the Joint Arctic Command (AKO), part of the Danish Armed Forces (Melhus, 2025: 69). In addition, the Greenland Institute of Natural Resources and the University of Aarhus play an important role in monitoring biodiversity and developing ecological indicators and assessments (Wienrich, 2022: 7).

Greenland's current **Waste Management Plan** (Affaldshandlingsplan 2020-2031) aims to implement a more holistic approach in the management of waste, including plastics. Whereas waste water management is not included, the plan sets short and long-term goals for various aspects of waste management: expanding and updating the legal framework at the national and local level to improve the transparency of financing and supervision, increasing public information and participation to spread knowledge and establish appropriate behaviour with regard to waste among both citizens and businesses. This includes the recycling of waste, the establishment of a circular economy and the prevention and reduction of waste throughout Greenland. The overall management of waste shall be improved through the establishment of reception centres in all towns and the strategic clean-up of old sites with the introduction of controlled new landfills. Finally, Greenland's Waste Management Plan relies heavily on the incineration of existing and future waste. With more than 20 small-scale incineration plants in operation in 2020, the plan is to replace and centralise the old incineration infrastructure by building two new, larger plants in its largest cities, Nuuk and Sisimiut (Nordic Council of Ministers, 2024b). These plants, with a combined daily capacity of 140 tons of municipal waste (some hazardous materials and metals are sent to Denmark), will provide district heating, process landfill waste to reduce methane emissions, and prevent leachate-related water pollution. Designed for low maintenance and fully automated operation, they operate without pre-treatment of waste, increasing efficiency and lowering cost (B&W Clean Power Production; 2024). To simultaneously clean up existing landfills and create a seamless waste disposal, the Plan calls for a nationwide infrastructure to transport waste to

incineration plants, mainly in Nuuk and Sisimiut. To ensure this environmentally sound management of all future waste, the Plan builds on the Community Management as a fundamental principle. All communities and municipalities must draw up their own plan in accordance with the guidelines and objectives of the national Plan (Naalakkersuisut, 2020; FAOLEX 2023).

In May 2021, the Government of Greenland adopted a **new action plan** to reduce the use of plastics. Focus area 4 in the plan deals with microplastics, including measures to reduce the spill to nature from artificial turf and from sewage water (Naalakkersuisut 2021). As a result of the Greenlandic action-plan to reduce consumption of plastics, the "Act on use of plastic bags and single-use plastics (SUP)" (Naalakkersuisut, 2022) entered into force.

Moreover, regarding plastic pollution through fishing gear, a recent report from the Nordic Council of Ministers comes to the conclusion that despite logistical challenges, Greenland has established "an effective system for collecting used fishing gear" (Einarrssson et al, 2025: 17). Thus, empty containers are utilised for return trips from small fishing villages, subsequently the gear is brought for sorting for example at a waste incineration facility in Nuuk. While there is no exact data on the amount of lost fishing gear, it is estimated to continue to be a crucial challenge in Greenlandic waters (Unsbo et al., 2022).

2.2. Iceland

The country's regulatory framework for plastics has been progressively strengthened to align with EU directives and national action plans. The **Sanitation Act of 1998 (7/1998),** amended in **2019 (34/2019)**, introduced bans and restrictions on common single-use plastics, mandated educational campaigns on waste prevention, and imposed requirements for producers to disclose environmental impacts. This extends to fishing gear, obligating manufacturers to fund waste clean-up efforts. Complementing this, the **1989 Beverage Packaging Act (52/1989)** establishes circular economy principles by mandating the collection and recycling of disposable packaging, while the **2017 Regulation 750/2017** revised the returning fees to enhance resource efficiency.

The **2003 Act on Waste Management (55/2003)** provides the basic legal foundation for Iceland's transition toward a circular economy, requiring the formulation of a national waste policy every 12 years and the development of regional waste management plans. It established a waste hierarchy, prioritising prevention over preparation for reuse, recycling, energy recovery, and disposal. The Icelandic Environmental Agency plays a crucial role in public education on sustainable waste practices. Meanwhile, marine protection is enforced through the **2004 Act on Protection Against Pollution of Seas and Beaches (33/2004)** and its **2012 Regulation (1010/2012),** which incorporates MARPOL Annexes into Icelandic pollution regulations. These laws prohibit the discharge of pollutants into the sea, mandate reception facilities for ship-generated waste, and require all vessels - excluding fishing boats, warships and recreational yachts - to pay waste disposal fees. Under this legislation, any marine pollution incident must be reported to the Icelandic Coast Guard, with penalties imposed on violators. The **2017 Regulation (586/2017)** fully implements all MARPOL provisions in Icelandic law.

The Icelandic **Association of Fishing Companies (SFS)** manages the collection and recycling of fishing gear waste under an agreement with the Icelandic Recycling Fund (Úrvinnslusjóður), achieving an estimated annual recovery rate of 80% (CIRCit Norden, 2025). Several certified stations across Iceland collect, sort and clean the waste, which is then transported to recycling plants, mainly

in Lithuania and Denmark, for further processing into new materials. By funding the collection and recycling of discarded fishing gear, SFS is taking responsibility, and in return, the agreement exempts synthetic fishing gear from recycling fees. (Urvinnslosjodur; SFS 2025) With 80% of the collected material recycled since 2022, the system has been successfully used since its first year of implementation, sending more than 2000 tonnes of fishing gear for recycling in 2023. (SFS 2024)

Moreover, the **2020 Iceland National Action Plan on Plastics, *Úr viðjum plastsins,*** establishes 18 targeted actions across three areas: minimising plastic consumption, enhancing recycling efforts, and reducing oceanic plastic pollution. Specific measures include restrictions on frequently littered single-use plastics, financial support for research into plastic-free alternatives, and improvements in waste management through expanded sorting systems and increased recycling fees. Additionally, the plan emphasises the prevention and mitigation of marine litter by addressing major sources of pollution, improving sewage treatment and mandating the marking, reporting and retrieval of lost fishing gear. Coastal clean-up projects are supported through dedicated grants from the Ministry of Environment, Energy, and Climate.

To strengthen scientific understanding, the plan promotes research on both micro- microplastic pollution, on which long-term monitoring and evaluation mechanisms are built to ensure the effectiveness of implemented actions. Further, businesses are encouraged to adopt responsible use through educational workshops and specific guidelines.

Building on these efforts, Iceland introduced the **2021 Strategy Paper 'Towards a Circular Economy'**, integrating previous policies into the project *Together Against Waste,* running from 2016 to 2027, and introducing the *General Strategy for Waste Management* (2021-2032). This framework aligns closely with the United Nations Sustainable Development Goals (SDGs), particularly Goal 12, which advocates for sustainable consumption and waste management.

Further regulatory measures address land-based pollution sources – including plastics: **Regulation 798/1999** focuses on safeguarding public health and the environment by enforcing sewage treatment requirements. Recognising the significant impact of fishing gear as a contributor to marine litter, **2020 Regulation (474/2020)** mandates the marking of all fishing gear with a flag, requires immediate retrieval effort following loss, and obligates reporting of lost gear.

Collectively, these policies and regulations reflect an increasingly comprehensive approach to combating plastic pollution, reinforcing circular economy principles, and ensuring environmental protection in alignment with international commitments by the Icelandic government (see also Franke, 2024). Still, a study of Ögmundarson and colleagues (2022) comes to the result that actual recycling rates for plastic packaging are still rather low (around 14.2% as of 2020), so that there is still a long way to go for Iceland to reach the EU target of an overall recycling rate for plastic waste.

2.3. Svalbard

The regulatory framework in Svalbard, as of yet, does not refer to pollution by marine plastics and microplastics specifically. Nonetheless, increasing efforts to prevent and reduce pollution through marine debris are underway.

The Svalbard Environmental Protection Act (15 June 2001 No.79, entered into force July 2002, last consolidated in January 2025, LOV-2024-12-20-99), is at the core of environmental protection for the archipelago, with the purpose of preserving a virtually untouched environment. The

regulations apply to the entire land area and the surrounding waters of Svalbard extending to the territorial limit (section 1-2). While not referring to microplastics of marine litter explicitly, some provisions are of relevance in that regard and especially part ii) of the Act, which includes sections 65 to 72 covering pollution and waste, is of relevance. Section 65 provides a general provision regarding pollution, stating that any action with a risk of pollution is unlawful under the Act and that, in danger of pollution, the person responsible for the activity from which the danger arises shall ensure that preventative measures are taken. The authority to issue orders for such measures, therein, lies with the environmental protection authorities.

The provisions under the Environmental Protection Act require further consideration in regard to marine plastic pollution, specifically microplastics, as these activities, like discharge and dumping of waste from ships, wastewater treatment, and the release of persistent and bio-accumulative substances. For example, according to section 66 no person may release any persistent, bio-accumulative and toxic substances into the environment. However, it excludes ordinary releases from household activities, service industries or other activities that result in releases of comparable extent. Further, section 67 prohibits the release of waste into the sea from a ship or vessel. An exception comprises the permission to discharge uncontaminated waste food from small vessels or sanitary wastewater in the open sea. Section 68 focuses on dumping and incineration of waste and other material from ships or other vessels, which is generally prohibited. An exception applies for the incineration of waste "generated as a result of the normal operation of a ship and [which] is permitted under the Regulations of 16 June 1983 No. 1122 relating to the prevention of pollution from ships" (MARPOL). Section 71 refers to waste and includes the prohibition of leaving waste outside of land-use planning areas, in which waste may only be left in designated sites and must be stored in a way to prevent leakage or any spreading. Waste may not be imported, and further regulation regarding the handling and treatment of waste may be taken by the ministry or an authorised entity. Management plans for the reduction of waste in the land-use planning areas may be drawn up by the governor.

In 2020, the Ministry of Climate and Environment issued the **Regulations Relating to Pollution and Waste in Svalbard (FOR-2020-07-03-1517, entered into force in 2021, amended in 2021, FOR-2021-06-21-2122),** with a legal basis in the Svalbard Environmental Protection Act, the Ship Safety and Security Act, as well as the Product Control Act, in view of the relevant sections referring to pollution and waste matters.

The Pollution Control Act (LOV-2024-12-06-74, entered into force 01.10.1983, last amended 2024), aims to protect the outdoor environment against pollution, reduce existing pollution, reduce the quantity of waste, and promote better waste management. The Act also applies to Svalbard and Jan Mayen (art. 3) and provides for the authorities of these areas the mandate to lay down any amendments to the Act which are required for pollution control in regard to local circumstances. The Act identifies different forms of pollution in its art. 6. These are the introduction of solids, liquids or gases to air, water or ground; noise and vibrations; light and other radiation as defined by the pollution control authority and effects on temperature, causing (potential) damage or nuisance to the environment. While not directly mentioning marine litter or marine plastics, they may fall under this definition. What is more, the Act includes the general duty to avoid pollution (art. 7), with limitations to this duty for certain sectors and activities, including fishing (art. 8), unless there are specific regulations issued. The pollution control authority is given the mandate to lay down regulations relating to pollution (art. 9).

In regard to macro-plastics, the Norwegian Environmental Agency, in collaboration with the Governor of Svalbard and support from the Arctic Expedition Cruise Operators (AECO), has prepared a **beach guide to help standardise** clean-up efforts, mitigate risks, and align conservation efforts with local policies. The Guidelines provide a structured framework for organising volunteer clean-ups while ensuring environmental protection and participants safety. The Guidelines include essential information on marine litter, planning procedures, local waste management, and registration requirements. They specify which areas require cleaning, where ongoing efforts are already in place, and outline access restrictions, including necessary notifications to authorities. Additionally, they address insurance obligations, the protection of culturally significant sites, and restriction on drone usage in protected areas. To ensure volunteer safety, the guidelines define responsibility for organisers and participants, mandate risk assessments, and include instructions on polar bear safety.

According to the governor of Svalbard, cleaning littered beaches has been part of the environmental work since 2000. Especially, Brucebukta on Forlandet and Luftskipodden are monitored, as marine waste annually drifting ashore in these locations is recorded through standardised registrations under the auspices of the **Environmental Monitoring Svalbard and Jan Mayen (MOSJ)** and **OSPAR** (Governor of Svalbard, 2024).

The Environmental Svalbard and Jan Mayen (MOSJ) is a governmental system that monitors the environment on Svalbard and Jan Mayen, with its secretariat being the Norwegian Polar Institute. It focuses on providing relevant information, in the form of indicators for the different focus areas, including pollution, which are relevant for setting political targets presented at the State of the Environment Norway. Several species and ecosystems/aspects of the environment are monitored for the level of pollutants, such as the bottom sediments in settlements in Svalbard, the atmospheric transport of pollutants to the Barents Sea, the quantities of beach litter, as well as pollutants in Polar cod, char, and Polar Bears (MOSJ website). The indicators for pollution are currently being revised and, thus, are not update at the time of writing.

The Waste Management of Svalbard faces challenges typical for Arctic regions. The "geographical peculiarities" contributing to high costs and a limited local expertise are hindering the development of a circular economy (Cowan et al., 2023, S. 552). Although recyclable and biodegradable materials are shipped to mainland Norway, non-recyclable waste must remain on the Archipelago, and limited sorting capacity makes it difficult to map waste streams and identify opportunities for local reuse. Recent national measures, including a 2021 ban on certain single-use plastics, stricter labelling requirements, and enhanced Extended Producer Responsibility (EPR) schemes, aim to reduce plastic waste and support circular economy principles, but their effects are only slowly materialising in remote regions like Svalbard. Despite these constraints, stakeholders show strong support for circular economy initiatives, recognising the potential of new infrastructure, pilot projects and collaborations with mainland experts to develop practical, context-specific solutions that are sensitive to Svalbard's fragile natural environment. (Norwegian Ministry of Climate and Environment, 2022; Cowan et al., 2023)

3. Supra-national initiatives

3.1. Arctic Council initiatives

The Arctic Council (AC), though lacking the mandate to enact legally binding resolutions, plays a crucial role in shaping policy, formulating recommendations, and conducting evaluations on environmental challenges in the Arctic. In recent years, its efforts to address plastic pollution have gained momentum, particularly through the Marine Litter - Regional Action Plan (ML-RAP), which was adopted in 2021. Coordinated by the Protection of the Arctic Marine Environment (PAME) Working Group, this plan provides a comprehensive framework for combating marine litter from both oceanic and terrestrial sources. It sets forth measures to reduce pollution originating from fishing activities, maritime transport, and offshore structures, while also advocating for improved waste management infrastructure in Arctic communities. Additionally, it emphasises the importance of sustainable material use, removal of marine debris from shorelines, expanded monitoring and research, and increased public awareness through education and international cooperation. As part of the Regional Action Plan on Marine Litter in the Arctic, PAME has been overseeing the Arctic Coastal Cleanup project since 2021, which aims to establish an international network of local clean-up actions (for further details, see policy paper “Frameworks supporting beach clean-ups" as well as section 4 “Best Practices”).

Beyond PAME and its ML-RAP, the Arctic Council’s other working groups have also intensified their focus on plastic pollution. The Arctic Monitoring and Assessment Programme (AMAP) has developed a **Litter and Microplastic Monitoring Plan**, along with supporting guidelines, for the Arctic ecosystem. The Conservation of Arctic Flora and Fauna (CAFF) has initiated a Plastics and Seabirds project, while the Arctic Contaminants Action Group (ACAP) and the Sustainable Development Working Group (SDWG) have jointly worked on waste-management projects targeting small Arctic rural communities in Alaska, the Canadian territories, and the Murmansk region.

In parallel with these efforts, the Arctic Marine Strategic Plan (AMSP) 2015-2025 has served as a guiding framework for expanding scientific understanding of marine ecosystems, tracking environmental changes, safeguarding biodiversity, and promoting responsible resource management. While the AMSP does not explicitly address marine litter, its commitment to the precautionary principle and the polluter-pays principle implies action against ocean pollution, including plastic waste and microplastics.

However, progress on these initiatives has been impacted by geopolitical tensions. Following Russia’s invasion of Ukraine in 2022, the Arctic Council first experienced an effective pause and later a significant slowdown in its operations, affecting its capacity to advance its plastic pollution mitigation efforts. Despite these challenges, the ML-RAP and AMSP remain critical instruments in guiding Arctic states and stakeholders toward more effective policies and actions to protect the region’s fragile marine environment.

3.2. European Union initiatives

The EU's geographic proximity to the Arctic translates to the particularly strong EU role in mitigating plastic litter and microplastic pollution impacting the region, even if releases of plastics into the sea and air from the EU are relatively small compared to other industrialised regions (e.g. Southern and Eastern Mediterranean and East Asia).

The EU Commission's efforts to address microplastics pollution are primarily coordinated by the Directorate-General for Environment (DG ENV). The European Union (EU) has set an ambitious target of reducing microplastic releases by 30% by 2030 as part of its European Green Deal and Zero Pollution Action Plan. This target encompasses both intentionally and unintentionally released microplastics, highlighting the need for comprehensive strategies to tackle the issue effectively. EU citizens have expressed significant concern about the environmental and health implications of microplastics, as demonstrated by surveys indicating that nearly 90% of Europeans were worried about their effects in 2020. The EU's scientific advisers advocate a precautionary approach, emphasising the need to address rising releases into the environment.[1]

The EU's efforts to combat microplastic pollution began with broader plastic waste management strategies, including the elements of the 2007 REACH (Registration, Evaluation, Authorization, and Restriction of Chemicals) regulation[2] and the Water Framework Directive. Recent measures have targeted specific sources of microplastics. For instance, in 2023, the EU adopted restrictions under REACH to phase out intentionally added microplastics in products such as cosmetics, cleaning agents, fertilisers, and pesticides. These restrictions, guided by advice from the European Chemicals Agency (ECHA), aim to prevent the release of an estimated 500,000 tons of microplastics into the environment over the next 20 years. The ban already applies to loose glitter and plastic beads used for exfoliation, with new classes of cosmetics encompassed gradually until 2035. Also, granular infill material used in artificial sport surfaces will be banned from 2031.

However, unintentionally released microplastics present a more complex challenge. These include microplastic emissions from synthetic textiles, tyre abrasion, and paints, which collectively contribute over 42,000 tons of microplastics annually in the EU. Recent regulatory efforts, such as incorporating tyre abrasion limits under the EURO 7 Regulation (effective 2026) and developing measures to prevent plastic pellet losses, are promising but require further technical advancements and enforcement. The challenge is compounded by Europe's status as one of the world's largest producers of plastics, responsible for 17% of global production in 2020.

Despite the Arctic being significantly affected by microplastic pollution, its visibility in EU policymaking on this issue has been limited. Long-range transport of microplastics from industrialised regions to the Arctic remains an underexplored area in EU strategies. However, for Arctic communities, understanding how EU policies influence pollution in their ecosystems is

[1] See, European Commission (2023). Commission Staff Working Document: Impact Assessment Report: Combatting micorplastic pollution in the European Union. SWD(2023) 332 final, Brussels, 16.10.2023.

[2] Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC.

crucial. Strengthening this knowledge can promote global action and enhance local resilience to environmental changes.

Furthermore, the EU has adopted several directives that directly and indirectly address plastic pollution in the oceans and aim to reduce its impact. The **1994 EU Directive on Packaging and Packaging Waste** is aimed at promoting the use of reusable packaging through the introduction of deposit return systems and the implementation of economic incentives to encourage sustainable practices. This Directive was incorporated into the European Economic Area Agreement in 1995, reinforcing its application across member states. In 2018, the EU introduced a new directive on reducing the consumption of lightweight plastic carrier bags, which imposed limits on the number of bags used per person annually and prohibited their free distribution. The directive emphasises waste prevention, reuse, and recycling of packaging, while also setting increasing recycling targets for packaging materials. It encourages member states to adopt deposit-return schemes and other effective measures to achieve these goals, further advancing the EU's commitment to reducing plastic waste and promoting sustainable packaging solutions. *(1994 European Parliament and Council Directive 94/62/EC on packaging and packaging waste) (Franke 2024, S. 75)*

To further improve waste prevention, the **2008 EU Waste Framework Directive** prioritised it above the preparation for reuse, recycling, recovery and disposal. Central to the framework is, next to the polluter-pays principle, the extended producer responsibility, which holds producers accountable for the entire lifecycle of their products. (*Directive 2008/98/EC of the European Parliament and of the Council on waste and repealing certain Directives) (Franke 2024, S. 77; see also policy paper on "Waste and Waste water Management")*

The **2019 EU Plastic Directive** focuses on specific plastic products that contribute significantly to environmental pollution, aiming to reduce and prevent their impact on ecosystems. It promotes the transition to a circular economy by implementing measures to eliminate single-use plastics (SUPs) where viable alternatives exist. In particular, it targets the ten most commonly found SUP items, which are a major source of plastic waste. These include items such as cutlery, plates straws, beverage stirrers and food containers, made of expanded polystyrene. Beyond regulatory restrictions, the directive includes initiatives to raise public awareness, ensuring that consumers are informed about sustainable alternatives and proper waste disposal practices. Additionally, labelling requirements have been introduced for certain plastic products to inform consumers about their environmental impact and appropriate disposal methods. Furthermore, it mandates that member states establish annual collection targets for the recycling of discarded fishing gear, addressing one of the leading contributors to marine litter. Here too, extended producer responsibility schemes have been implemented, ensuring that manufacturers cover the costs associated with waste management, cleanup, and public awareness campaigns. (*Directive (EU) 2019/904 of the European Parliament and of the Council on the reduction of the impact of certain plastic products on the environment) (Franke 2024, S. 78)*

3.3. International policies and legal instruments

There are various international treaties which regulate partial dimension of the disposal of plastics in the ocean. These treaties include the London Convention, United Nations Law of the Sea, the MARPOL Annex V, and, in particular the Polar Code.

London Convention (1972): The 1972 London Convention on the Prevention of Marine Pollution by Dumping Wastes and Other Matter directly regulates the Dumping of wastes and requires states to „promote the effective control of all sources of pollution of the marine environment" as well as to „take all practicable Steps to prevent the pollution of the sea by the dumping of waste" (London Convention Art. I). The dumping of „persistent plastics and other persistent synthetic materials" and other materials listed in Annexe I is strictly prohibited in Article. IV (a), while some types of pollutants included in Annex II, such as pesticides, lead and copper, are tolerated, provided a special permit has been issued (Art. IV (b)). Meanwhile, the discharge of any other material not mentioned in Annex I or Annex II into the ocean requires a general permit (Art. IV (c)). The London Convention imposes a general obligation on all signatory states, although the Convention realises that the goal of preventing marine pollution caused by dumping can only be reached collectively, not least as states' capabilities differ. Therefore, Art. II conveys: „Contracting Parties shall […] take effective measures individually, according to their scientific, technical and economic capabilities, and collectively, to prevent pollution […]" (Dewey et al, 2023:3) (Franke, 2024: 65 f.)

London Protocol (1996): The 1996 London Protocol, gradually replacing the London Convention, does not intend to stop the waste dumping entirely. Its more restrictive „reverse listing approach" (Chen 2015, S. 400) prohibits the discharge of any wastes or other matter, allowing for special permits only for materials listed in Annex 1 - including fishing nets and ropes - while the issuing states must follow the conditions set out in Annex 2 (Art. 4). Implementing the protocol, the states are responsible for measures punishing breaches (Art. 7) and making polluters pay (Art. 3). Like the London Convention, the Protocol places the collective goal above national responsibility and action but goes further in calling for harmonised (Art. 1) measures following a precautionary approach (Art. 3).

MARPOL Annex V (1973/1978): The International Convention for the Prevention of Pollution from Ships of 1973 has been amended by the Protocol of 1978 [MARPOL]. The convention covers the prevention of pollution from ship operations and accidents in general, while Annex V focuses on pollution caused by all forms of garbage disposal in the marine environment, including a complete ban on:

"[…] the disposal into the sea of all plastics, including but not limited to synthetic ropes, synthetic fishing nets, plastic garbage bags and incinerator ashes from plastic products which may contain toxic or heavy metal residues, is prohibited." (MARPOL Annex V, Regulation 3 (a))

Although the Arctic Ocean is not designated as a special area in Regulation 5, the environmental provisions of the Polar Code are mandatory under Regulation 3.

The Annex provides only a limited number of exemptions, recorded in Regulations 4 and 6. Regulation 4 imposes special conditions regarding the dumping of food waste at sea, while Regulation 6 permits the dumping of garbage for the safety of the vessel and the crew and does not impose penalties for pollution resulting from accidents or the accidental loss of fishing gear, provided all necessary precautions were taken.

Regulation 7 mandates that States ensure the provision of facilities for the reception of garbage from ships.

While the regulations apply to all types of vessels, from fishing boats to pleasure yachts, it is noteworthy that Regulation 9 requires all ships over 12 metres in length to display placards

outlining the necessary information on the disposal mechanisms as set forth in Annex V. Furthermore, every ship with a gross tonnage of more than 400 tons or certified to carry more than 15 persons must provide a garbage management plan, which, among other requirements, regulates the storage and disposal of waste. Ships of such conditions, calling internationally at offshore platforms, are also required to keep a Garbage Record Book.

While the responsibility for enforcing MARPOL rests with the individual states, the **International Maritime Organization (IMO)** has established the Member State Audit Scheme (IMSAS) – mandatory since 2016 – to ensure the uniform and effective implementation of MARPOL regulations. (Dewey et al, 2023:3) (Franke, 2024: 64 f.) (IMO: https://www.imo.org/en/OurWork/MSAS/Pages/Default.aspx)

UNEP GPA's Evaluation Guideline (UNEP(OCA)/LBA/IG.2/7): Since 1995, the United Nations Environmental Programme (UNEP) has established the Global Programme of Action for the Protection of the Marine Environment (GPA), a proactive framework for the continuous evaluation of how nations' management objectives are met. It addresses measures aiming to prevent and reduce degradation of the marine environment and the modification of contaminants, and requires certain economic, regulatory and educational measures to be taken. The Guidelines also call for the „identification of short-term and long-term data-collection" (UNEP GPA's Evaluation Guideline II D.) and a comprehensive monitoring and reporting of environmental conditions. (Franke 2024, S. 80f.)

The **Honolulu Strategy** is a global framework for the prevention and management of marine debris, jointly developed by the United Nations Environment Programme (UNEP) and the U.S. National Oceanic and Atmospheric Administration (NOAA).

It was first released in 2011 following the 5th International Marine Debris Conference in Honolulu. It is not a legally binding treaty, but a voluntary action plan to provide state and non-state actors with a manual of strategies and measurable goals to reduce marine debris from land- and sea-based sources. As such, it has also informed the **UN negotiations toward a global plastics treaty** (see below).

Polar Code (2014, in force 2017): The Polar Code establishes critical environmental regulations to protect the fragile ecosystems of the Arctic and Antarctic, including a strict prohibition on the discharge of plastics to prevent pollution in these vulnerable waters. Additionally, since 2013, vessels passing through the Barents Sea `Ship Reporting System` area (Barents SRS) have been required to register in either Vardø, Norway, or Murmansk, Russia, which allows for the monitoring and regulation of maritime activities in the region. By obligating the registration for vessels over 5000 gross tons, all tankers, all ships carrying hazardous or polluting cargo, ships under tow exceeding 200 meters, and all ships with propulsion or maneuverability issues or defective navigation aids (Kystverket, 2025; IMO), the Barents SRS complements the navigational control efforts of the Polar Code and serves as a tool to implement it (Dewey 2023:4). While these measures contribute to reducing environmental harm, the Polar Code does not apply to smaller vessels, such as recreational yachts and fishing boats, creating a regulatory gap that leaves a significant portion of maritime traffic unregulated. The code applies primarily to passenger and cargo ships of 500 gross tons or more, extending provisions of MARPOL and SOLAS. As an Annex to both treaties, it is legally binding for signatory states and offers both mandatory requirements and recommendations beyond environmental protection. To enhance safety and reduce environmental impacts in polar waters. A Polar Ship Certificate, issued by Member States, is required for ships

covered by the code, confirming their suitability for operation in Arctic and Antarctic conditions. However, the voluntary nature of some provisions and the exclusion of smaller vessels highlight gaps in environmental protection, necessitating further regulatory efforts to address pollution risks from all maritime activities. (Dewey 2023:3)

UN SDG: Adopted in 2015, Resolution 70/1 by the UN General Assembly (UNGA), the UN Sustainable Development Goals (SDGs) provide a global framework for environmental action and protection. SDG 14. "Life Below Water" specifically focuses on the conservation and sustainable use of oceans and, in Target 14.1, emphasises the need to reduce marine pollution of all kinds by 2025, **identifying the density of plastic debris as a key indicator of progress.** Additionally, SDG 6 (Clean Water and Sanitation), SDG 11 (Sustainable Cities and Communities), and SDG 12 (Responsible Consumption and Production) indirectly address marine litter by promoting waste reduction, improved waste management, and pollution prevention in inland waters. The UNGA Resolution 70/312 further reinforces the commitment to achieving SDG 14, underscoring the urgent need for coordinated global action to mitigate marine pollution. (Franke 2024, S. 82) (UNGA Res 70/1 und 70/312) (https://sdgs.un.org/goals/goal14#targets_and_indicators)

CBD Kunming-Montréal Global Biodiversity Framework: Adopted by the 15th Conference of the Parties to the UN Convention on Biological Diversity in 2022 (COP UN CBD), the Global Biodiversity Framework sets 23 targets to be achieved by 2030, including the "30 by 30" goal, which aims to protect 30 % of the planet's ocean by 2030. Among these, Target 7 specifically addresses plastic pollution, highlighting the need for comprehensive measures to reduce its impact on biodiversity and ecosystem health.

Negotiations about New Global Plastic Treaty: In the face of the shortcomings of existing international regulations, negotiations about a Global Plastic Treaty under the umbrella of the United Nations Environment Programme (UNEP), which started in 2022, can be considered an important opportunity for more effective regulations for combating plastic in the Arctic and worldwide. The level of ambition is highly discussed; ISL and GRL are part of the so-called "high ambition coalition", and the Inuit Circumpolar Council (ICC) is also demanding stricter regulations for the Arctic region. The negotiations have so far not succeeded in finalising a treaty text. INC-5.1 in Busan (December 2024) failed to reach an agreement on key issues such as caps on virgin plastic production, chemicals of concern, product design, extended producer responsibility, and financing for implementation. These conflicts carried over to INC-5.2 in Geneva (August 2025), where no consensus could be found either. Major sticking points remain full life-cycle approaches versus focusing only on waste, binding versus voluntary obligations, decision-making by consensus versus voting, and how to share costs, especially supporting developing countries. As of now, no future session date has been formally confirmed, so the future of a global treaty is unclear at the moment. An alternative currently discussed is a so-called coalition of the willing, which would be a group of states that move ahead voluntarily—outside or alongside the official UN treaty process, so as to adopt binding or coordinated measures against plastic pollution.

OSPAR (Commission of the Oslo-Paris Convention for the Protection of the Marine Environment of the North-East Atlantic)

The OSPAR Commission provides a structured framework for collaborative efforts to safeguard the marine environment of the North-East Atlantic. The Commission's Strategy outlines measures to minimise marine litter, with a particular focus on microplastics. To achieve these objectives, the

strategy is supported by two successive **Regional Action Plans (RAP),** which include initiatives aimed at limiting the use of single-use plastics in maritime industries, addressing pollution from both ocean and land-based sources, implementing clean-ups and enhancing public awareness through education and outreach activities.

The **RAP I, from 2014 to 2021**, includes several actions targeting pollution from fishing and aquaculture. In particular, plastic fishing gear, which is abandoned, lost or discarded at sea and left to degrade, contributing to the microplastic pollution, is the subject of several actions. The actions aim to identify hotspots and use risk assessment to identify particularly vulnerable areas and species and to prioritize them removal plans (Actions 35, 53, 56 and 57). OSPAR has also developed best practices for the design and recyclability of fishing gear in Action 36. **RAP II, from 2022 to 2030,** devotes section B.4 to the Seaside Pollution from Commercial Fishing, Recreational Fishing and Aquaculture. Building on the results of the previous plan, RAP II aims to prevent, locate, recover and manage lost fishing gear (B.4.1) and to recommend national policies and best practices that contributing to the transition to a circular economy (B.4.2). In an effort to fill the current knowledge gap on plastic pollution from recreational fisheries, OSPAR assesses the significance of recreational fisheries and formulates specific actions (B.4.4). However, under B.4.5, RAP II aims to raise awareness and update training and certification standards for both industrial and recreational fisheries.

Supporting this, OSPAR developed Monitoring Guidelines (Guideline for Monitoring Marine Litter on Beaches in the OSPAR Maritime Area' (OSPAR Commission 2010)), which enable states to quantify and monitor beach clean-ups by local actors. The Guidelines provide standards which serve as a framework for marine litter assessment, ensuring uniformity in data collection methods. These standards include a detailed survey form and an illustrated reference guide, enabling the systematic classification and documentation of various waste materials. By establishing a consistent approach to data gathering, these guidelines enhance the accuracy and comparability of marine debris monitoring, supporting informed decision-making and the development of targeted mitigation strategies. (see: OSPAR: Regional Action Plan (RAP) for Marine Litter (2014-2021)

RAP ML 2 https://www.ospar.org/work-areas/eiha/marine-litter/regional-action-plan/rap2

Moreover, the **Coordinated Environmental Monitoring Programme (CEMP)** of OSPAR consists of guidelines for the monitoring of microlitter (including microplastics) in seafloor sediments for the OSPAR maritime area *(OSPAR MicroPlastic Expert Group, 2024, OSPAR Agreement 2024-06)* https://www.ospar.org/documents?v=35413. The OSPAR CEMP Guidelines propose the development of a new indicator to address the current lack of knowledge on the occurrence and abundance of microlitter and microplastics in marine sediments within its entire maritime area. As such, the document establishes, a monitoring and sampling strategy to increase long-term monitoring efforts, ultimately contributing to the development of mitigation measures to reduce plastic pollution, in accordance with its **Regional Action Plan** (2022-2030), whereby OSPAR aims to significantly reduce marine litter, including microplastics (The OSPAR Acquis: Decisions, Recommendations & Agreements | OSPAR Commission).

4. Regulatory and policy gaps, current developments and best practices

As the Arctic is unavoidably connected to and threatened by any and all global action, a global Plastic Treaty would have an impact on the efforts against the Plastic Pollution. The (temporary) failure of the global plastics treaty negotiations under the auspices of UNEP, which leaves the future of international plastic regulations indeterminate as for now, is a squandered opportunity to address existing gaps within international initiatives against plastic pollution. At least in the short to medium term, at the international level, regional initiatives will have to become more important in this regard. Potential leadership could be assumed by the Arctic Council, or even more, the Nordic Council, which already initiated initiatives like the report "Towards Ending Plastic Pollution by 2040: 15 Global Policy Interventions for Systems Change" (2025) or the Nordic Ministerial Declaration on Microplastics (September 2024).

At the national political level, traditionally, combating plastic pollution has not been a political priority, which can, for example, be reflected by the quite low recycling rate in Iceland (moreover, there is a lack of comprehensive data regarding the Greenlandic case). There are, however, more recently emerging regulatory initiatives in Iceland, Svalbard, and, to a lesser degree, also in Greenland. For instance, the highly negative impact of lost fishing gear has been recognised, but management initiatives are still facing many challenges. So, a recent report from the Nordic Council of Ministers came to the conclusion that "none of the Nordic countries [including Greenland, Norway and Iceland] has a comprehensive system to track fishing gear from purchase to disposal". (Nordic Council of Ministers, 2025: 3).

On the local level in particular, various voluntary initiatives can be found. These include clean-ups as well as local waste reduction programs. Cooperation between NGOs, private entities, and governmental actors has helped mitigate some effects of plastic pollution, raise awareness of plastic contamination, and advocate for improved waste management beyond regional capacities.

Notably, the Governor of **Svalbard's** official guide for beach clean-ups from 2024, as outlined in 2.3, might be considered a best practice in this regard. To mobilise volunteers and encourage Svalbard's population to participate in additional community-led clean-up missions, the Governor of Svalbard initiated an annual clean-up mission in 2000. The mission, "Clean up Svalbard", targeting remote and isolated areas, entails deploying carefully selected and trained volunteers to heavily polluted beaches that are otherwise inaccessible. The Governor's Office provides accommodation, logistics, ensures proper waste disposal and data collection, demonstrating how structured leadership can sustain long-term environmental action and inspire further volunteer initiatives. Clean up Svalbard is supported by the digital tool Rent Hav, which allows participants to register new beaches that need to be cleaned, how much waste has been removed and if the clean-up was organised in affiliation with the AECO. The tool can be used across Norway (for further details, see policy paper on supporting beach clean-ups).

Government efforts to support the local and voluntary action can also be seen in **Iceland's** national coastal clean-up program, which offers grants to support local voluntary actions. For example, the Icelandic Clean up-project of the **Ocean Missions** organisation, a beneficiary of Iceland's

governmental funding, is able to provide transport and food for volunteers. In an effort to raise awareness and educate the public, the organisation also offers sailing trips where tourists participate in litter collection, help with research and learning about environmental issues. Promoted as responsible tourism, the trips focus on a variety of issues, including wildlife, the plastic problem, fishing gear and noise pollution.

The **Greenlandic** government also aims to reduce the impact of pollution both on marine wildlife and terrestrial environments. By organising and financing the International Whaling Commission's Entanglement Response Training, Greenland aims to educate wildlife officials as well as fishermen and subsistence whalers about the direct impact of lost fishing gear on marine wildlife, especially marine mammals. In addition to marine-focused efforts, Greenland has launched several initiatives to address plastic pollution on land. The NGO **CSR Greenland** has established the national clean-up day, Saligaatsoq, which mobilises companies, associations, and private citizens to remove waste from cities and natural areas, fostering local engagement in environmental stewardship. The Ministry of Nature and Environment's "Nature's Superheroes" project educates schoolchildren on waste sorting and conservation through interactive activities, while the social media movement "Plastic Not So Fantastic" connects over 4,200 people to share best practices and local waste management solutions.

Inter- and transnational efforts have proven to be effective as well, especially traversing across the levels of international governance and stakeholder communication. The **Arctic Coastal Cleanup,** overseen by the Arctic Council Working Group PAME (see section 3.1) and funded by the Norwegian Ministry of Climate and Environment and the NGO Ocean Conservancy, sets an example by connecting local and voluntary cleanup efforts with supra-regional and governmental programmes and managing a common structured collection of data on marine litter. The generation of critical data on the sources, types and distribution of marine debris in the Arctic facilitates informed discussions with polluters and contributes to the formulation of science-based international marine debris policy and waste management strategies, strengthening the foundation for long-term marine conservation in the Arctic. However, the initiative faces inherent challenges, including logistical constraints, unpredictable funding and limited clean-up seasons due to the harsh Arctic conditions (for further details see policy paper on Beach clean-ups).

In addition to international governmental and local efforts, the tourism industry has made voluntary commitments to clean up the coastline, with cruise tourism leading the way with a range of beach clean-up activities. The **AECO's Clean Seas Program** is particularly noteworthy. In Iceland, AECO works with local authorities and provides guidelines for predetermined coastal locations, where passengers are encouraged to collect litter. In both tourism destinations, the association offers a public report form that can be sent to AECO to keep track of its members' clean-up activities and to create a database on the pollution of the sites (for further details, see policy paper on beach clean-ups).

While these mentioned voluntary initiatives are valuable, they cannot replace legally binding regulations, as well as governance initiatives to address plastic pollution at its source. Moreover, ensuring financial support for broader participation, including Indigenous communities, remains essential for sustainable long-term solutions.

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