



Standards and Related Initiatives in International Cooperation to End Plastic Pollution: Mapping and State of Play

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Abbreviations

COBSEA	Coordinating Body on the Seas of East Asia
DPP	Dialogue on Plastics Pollution
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
HS	Harmonized Commodity Description and Coding System
IEC	International Electrotechnical Commission
IMO	International Maritime Organization
INC	Intergovernmental Negotiating Committee
INC-2	Second Session of the Intergovernmental Negotiating Committee
ISO	International Organization for Standardization
MARPOL	International Convention for the Prevention of Marine Pollution from Ships
MSC	Marine Stewardship Council
POPs	Persistent Organic Pollutants
PVC	Polyvinyl Chloride
SPS	Sanitary and Phytosanitary
TBT	Technical Barriers to Trade
UN	United Nations
UNEA	United Nations Environment Assembly
WCO	World Customs Organization
WTO	World Trade Organization

Executive Summary

As concerns increase over the magnitude and impact of plastic pollution across the globe, efforts to identify solutions are gaining momentum. At the international level, the most significant intergovernmental initiative is the ongoing work of an Intergovernmental Negotiating Committee (INC) on an international legally binding instrument to end plastic pollution (hereafter the “plastics treaty negotiations”) to be concluded by the end of 2024. Meanwhile, at the World Trade Organization (WTO), 76 members (as of August 2023) are supporting a WTO Dialogue on Plastics Pollution and Environmentally Sustainable Plastics Trade (DPP), which was established in 2021 to explore how improved trade cooperation could support and complement international efforts to reduce plastic pollution.

The relevance of standards and standard-setting processes has arisen as a crosscutting issue in the plastics treaty negotiations. During the course of discussions at the second session of the INC (INC-2) in Paris, which took place from 29 May to 2 June 2023, a range of governments and stakeholders noted the relevance of common product design standards, requirements, certification, and labelling. These could advance various objectives such as encouraging reduction, reuse, and repair of plastic products and packaging, extended producer responsibility, and improving the transparency of the material composition of production. A crosscutting issue noted by some governments and stakeholders is the need for common global rules and coordinated approaches to end plastic pollution, including around standards. As part of intersessional work of the INC, some governments and stakeholders have also called for the compilation of existing standards and certification aiming to verify circularity of plastics, and how this could be reflected in design criteria, and clarifying definitions and criteria for identifying various types of products and substances.

Meanwhile, several other international processes have ongoing work on standards relevant to the plastics treaty, and that can complement ongoing efforts through the INC. At the DPP, among the issues under discussion are priorities for cooperation around standards to support the transformation of global supply chains and avoid fragmentation as well as how to address developing country concerns about technical and implementation capacity. Alongside, issues of standards related to ending plastic pollution are taken up in a range of international processes including in the context of existing multilateral environmental agreements, such as the Basel and Stockholm conventions, as well as by the International Organization for Standardization (ISO).

Against that backdrop, this paper is intended to inform discussion on the role that international cooperation on standards can play in supporting global efforts to end plastic pollution. It starts with a brief overview of existing standards and standard-setting processes. In doing so, the paper seeks to clarify some of the confusion about the terminology of “standards” by separating and describing three categories of instruments that are described by the different actors as standards:

- *Government legislation, regulations, and initiatives* developed and implemented by governments at the international or domestic level.
- *Voluntary multistakeholder standards* established by standardization bodies at the international, regional, and national levels.
- *Non-governmental initiatives* that involve multiple stakeholders, including the private sector, non-governmental organizations, governments, and intergovernmental organizations, but fall outside of the first two categories.

The paper reviews each of these categories, including the various processes for their development. Illustrative examples from each of the categories along the plastics life cycle are provided in an accompanying Annex.

Finally, the paper explores the interplay between these categories of standards and standard-setting processes. It also underscores the role that standards will have in the development and implementation of an international legal framework aimed at ending plastic pollution. In this regard, it outlines questions and issues related to the development, applicability, or implementation of standards for consideration by governments and stakeholders participating in international processes that aim to strengthen international cooperation on plastic pollution, such as the INC and the DPP.

Among the priorities highlighted for consideration are:

- Promoting inclusiveness and effectiveness by improving access to and effective participation in standards development processes by developing countries and their stakeholders, and by environmental organizations.
- Improving cooperation and coordination on standards to promote transparency and manage differences. Options for managing differences may include harmonization through international standards, regulatory cooperation processes, and pursuing mutual recognition of conformity assessment procedures and equivalence of standards and technical regulations. This improved cooperation includes the implementation of standards, including through technical assistance, training, capacity building, technology transfer, investment, and financial support.
- Reviewing and mapping standards in their various forms across the life cycle of plastics, including to identify gaps. Addressing “standards gaps” where additional international standards and criteria will be required, including in regard to product design, reuse and refill systems, environmental labelling, recycling, and substitute materials.
- Reinforcing and promoting improved cooperation between governments, international organizations, civil society representatives, and the private sector on the implementation of standards, including through technical assistance, training, capacity building, technology transfer, investment, and financial support.

Introduction

As concern increases over the magnitude and impact of plastic pollution across the globe, efforts to identify solutions are gaining momentum. Governments, businesses, civil society, and other stakeholders are pursuing new initiatives in varying configurations across domestic, regional, and global settings. At the international level, the most significant intergovernmental initiative is the ongoing work of an Intergovernmental Negotiating Committee (INC) on an international legally binding instrument to end plastic pollution, to be concluded by the end of 2024.¹ Meanwhile, at the World Trade Organization (WTO), 76 members (as of April 2023) are supporting a WTO Dialogue on Plastics Pollution and Environmentally Sustainable Plastics Trade (DPP), which was established in 2021 to explore how improved trade cooperation could support and complement international efforts to reduce plastic pollution.²

The relevance of standards and standard-setting processes has arisen as a crosscutting issue in the INC negotiations. During the course of discussions at the second session of the INC in Paris (29 May–2 June 2023), a range of governments highlighted the importance of common standards and criteria to achieving sustainable consumption and production (UNEP, 2023b). Specific proposals around standards have also been made by members as part of discussions around core obligations under a global plastics treaty (UNEP, 2023b). Issues identified during initial stages of the INC negotiations include, for example, proposals related to international standards for sustainable

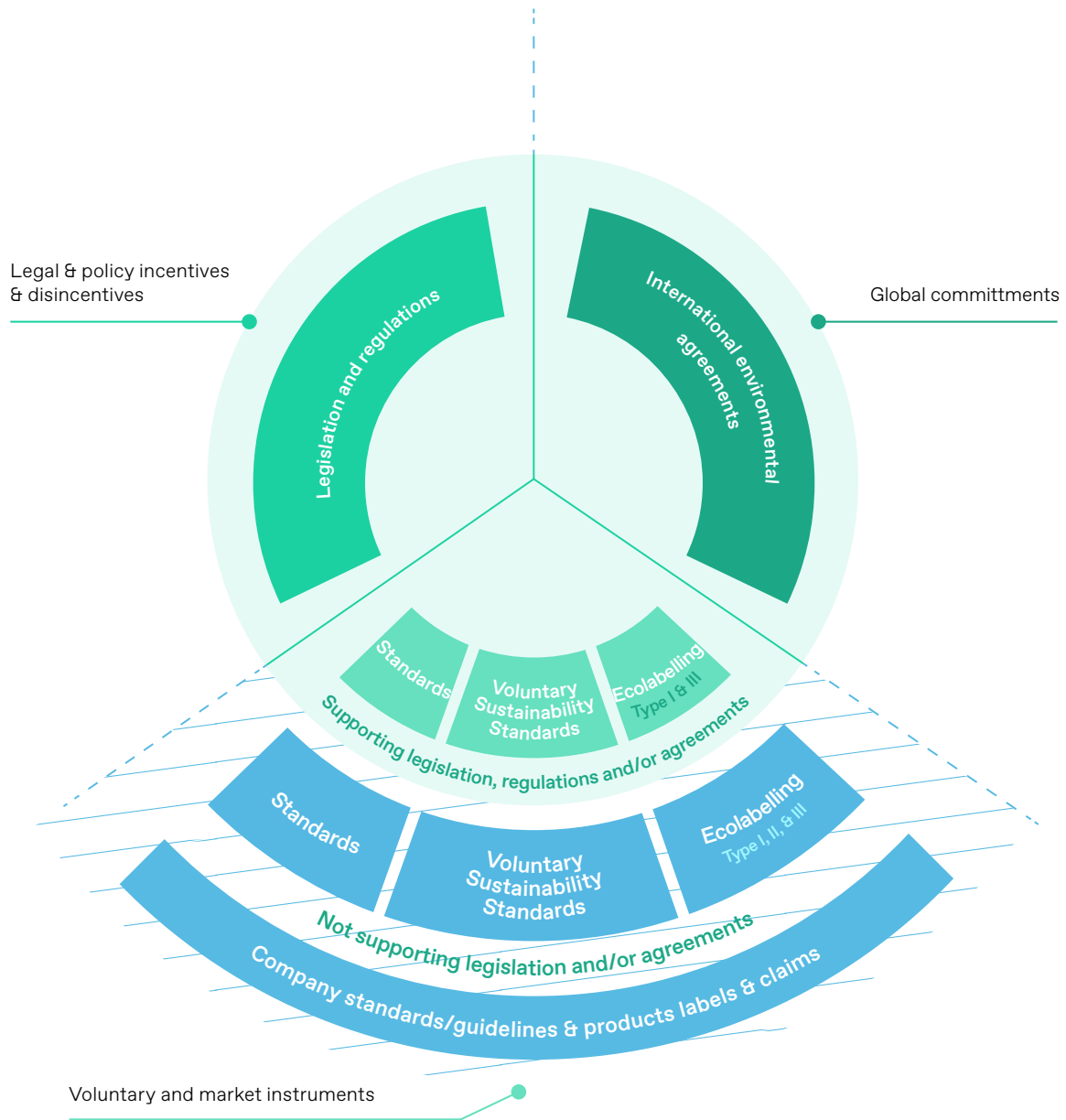
product design, trade, and distribution, as well as for primary plastics and for transparency of the material composition of products.³

Standards have also arisen as an important theme of discussion at the WTO.⁴ The ministerial statement establishing the DPP makes reference to enhancing cooperation with international organizations on issues related to standards, labelling, and related areas, and to the International Organization for Standardization (ISO).⁵ As the work of the DPP advances, participating members have also noted challenges related to the fragmentation and diversity of standards, the environmental credibility of standards, and developing country concerns about technical and implementation capacity. Standards are also directly relevant to intergovernmental efforts in other fora to better regulate cross-border flows across the life cycle of plastics, including at the World Customs Organization (WCO).⁶

Standards and standard-setting on plastics and plastic pollution regularly arise in the context of discussions in the INC and DPP, as well as in the context of domestic regulation. To the extent that INC and DPP participants address issues of standards in their work, this will have links to a broader set of relationships between existing standards and standard-setting processes, global commitments, domestic legislation and regulations, and voluntary and market instruments. Figure 1 outlines these relationships.

1. United Nations Environment Assembly, Resolution 5/14, End plastic pollution: Towards an international legally binding instrument, UNEP/EA.5/Res.14, (March 2, 2022).
2. Committee on Trade and Environment, WTO Informal Dialogue on Plastics Pollution and Environmentally Sustainable Plastics Trade, Communication from Australia, Barbados, Cabo Verde, Canada, Central African Republic, China, Costa Rica, Ecuador, Fiji, The Gambia, Jamaica, Kazakhstan, Morocco, New Zealand, Switzerland, Thailand and United Kingdom, WTO Doc. WT/CTE/W/250/Rev.1 (July 26, 2021).
3. See UNEP (2022b) slides 7–8, 11, and 14.
4. For example, technical regulations and specifications related to plastics have been discussed in the WTO TBT Committee. The issue of standards has also been discussed in the context of the WTO DPP, where standards and cooperation on standards have been deemed relevant to trade-led efforts to address plastic pollution (see Section 5.3).
5. World Trade Organization, Ministerial Statement on Plastic Pollution and Environmentally Sustainable Plastics Trade, WTO Doc. WT/MIN (21)/8/Rev.2, (December 10, 2021).
6. At the WCO, standards have also been discussed in the context of the role of the Harmonized System in reflecting the movement of trade towards a more circular economy and how the relevant product characteristics could be identified at the border, for example for traceability for plastic waste materials to ensure circularity of plastic waste (WCO, 2022).

Figure 1. Illustrative Overview of the Role of Standards in Environmental Governance



Note: Type I ecolabelling follows ISO 1024 and is a type of ecolabelling that is voluntary, multiple-criteria based, and verified by a third party. Type I ecolabels are usually independent, but may have regulatory basis e.g. EU Ecolabel. Type II ecolabelling, which may follow ISO 14021, provides self-declaration of conformity without third-party verification; it may also not comply with any standard. Type III are environmental declarations for specific aspects of products using a life-cycle approach (ECOS, 2021).

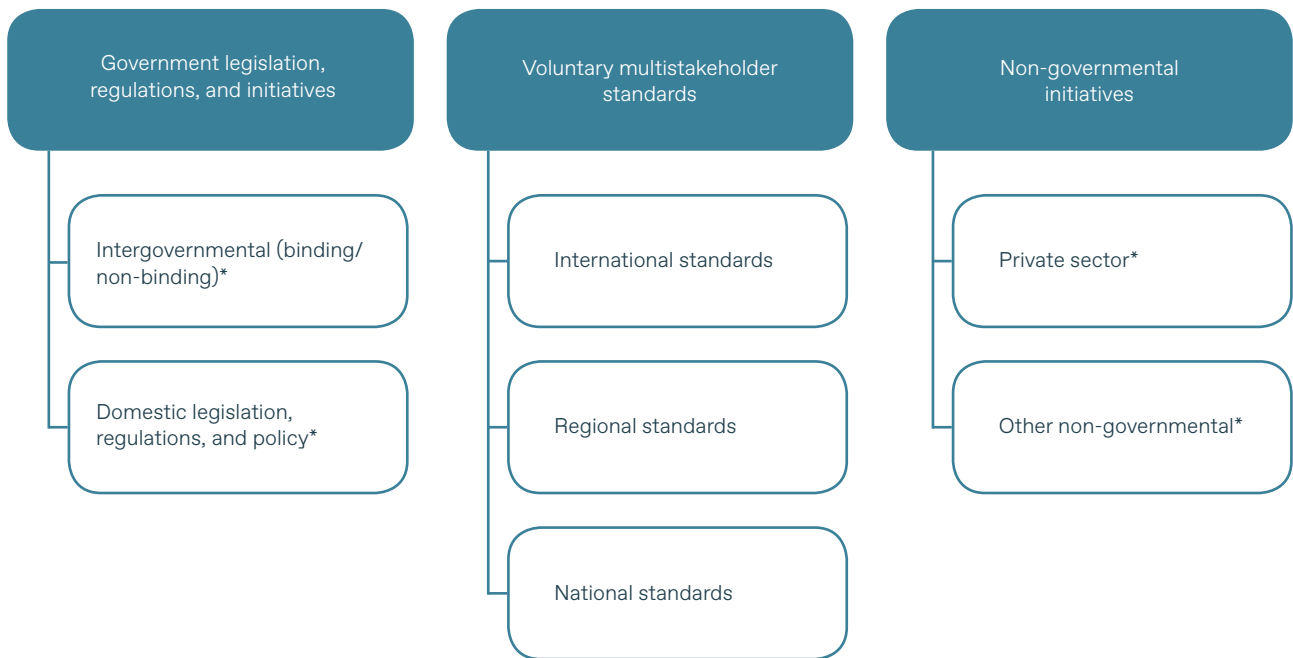
The category titled “standards” are those developed by a recognized standards organization and corresponds to the category of “voluntary multistakeholder standards” discussed in Sections 1-3 of this paper. The category titled “voluntary sustainability standards” corresponds to the category of “various non-governmental initiatives” (including private sector initiatives) discussed in Sections 1-3 of the paper.

Source: Authors’ elaboration based on ECOS (2021).

Against that backdrop, Part I of this paper aims to inform discussion on the role and relevance of international cooperation on standards to the global effort to end plastic pollution by providing an overview of three categories, informed by Figure 1, namely: (i) government initiatives at the international level, including treaties, as well as legislation, regulations, and other initiatives at the domestic level, (ii) voluntary multistakeholder standards, and (iii) non-governmental initiatives (see Figure 2).

Part I also seeks to clarify the conceptual distinctions between the three categories, which are sometimes interchangeably referred to as establishing “standards”, and to highlight connections between them. In so doing, the paper does not attempt to establish a single definition of a “standard”, or establish the scope of what may be referred to as a “standard”, but rather seeks to shed light on the landscape of relevant categories of initiatives that may constitute, inform, or complement standards.

Figure 2. Categories of Plastics Initiatives Discussed in Sections 1–3



*May reflect/incorporate voluntary standards

Specifically, Section 1 of Part I addresses “government legislation, regulations, and initiatives” developed and implemented by governments at the international or domestic level. These include, rules that governments are bound to respect under international treaties to which they are parties, as well as best practices, guidelines, or other voluntary instruments that

governments (or other entities) may decide to apply. They also include legislation, regulations,⁷ and initiatives developed and implemented at the domestic level. At both the intergovernmental and domestic levels, governments sometimes decide to integrate or incorporate references to “voluntary multistakeholder standards” discussed in Section 2, and, in the case of domestic regulations,

7. Including technical regulations, within the meaning of Annex 1.1, WTO Agreement on Technical Barriers to Trade.

sometimes may make certain voluntary standards mandatory within their jurisdictions. While governments might allow the participation of other stakeholders in the process of developing or implementing such approaches, the decision to adopt these laws, regulations, and initiatives ultimately lies with the treaty parties or regulating government.

Section 2 of Part I covers “voluntary multistakeholder standards” established by standardization bodies at the international, regional, and national levels. There is no universal definition for a voluntary multistakeholder standard, and standards developed through these various processes may be wide-ranging; they may potentially cover product and process standards for goods, as well as standards for services. At the international level, for example, ISO and the International Electrotechnical Commission (IEC) have characterized a voluntary standard, broadly, as “a document established by consensus and approved by a recognized body that provides for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context” (ISO & IEC, 2004).

The processes used to develop voluntary multistakeholder standards are typically characterized by stakeholder engagement, including governments, industry, academia, and civil society, and by consensus-based decision-making. These standards are voluntary in that governments and stakeholders can choose when, whether or how to use them. At the same time, certain international trade rules, such as the WTO Agreement on Technical Barriers to Trade (TBT Agreement), encourage governments to use international standards as a basis for certain forms of domestic regulations, and in so doing articulate

certain requirements in relation to those standards. As observed in Section 2, some standardization bodies have also used standard-setting principles set out by the WTO to inform their own processes for developing standards.

Section 3 of Part I addresses “non-governmental initiatives” that fall outside the categories outlined above, but that are part of the landscape of “standards” to address plastic pollution. These include initiatives developed and implemented by industry groups or companies that set out individual or collective practices for reducing plastic pollution within companies, or associated with their products or services. These initiatives may be voluntary, allowing relevant private sector actors to decide to participate, or may be integrated into contractual obligations established between private companies. Private stakeholders might, in developing their initiatives, involve the participation of additional stakeholders. Relevant initiatives may also include processes led by non-governmental organizations that oversee the development of plastics-related design standards, drawing on the participation of stakeholders that may include industry, consumers, workers, government, testing organizations, and civil society actors.

Section 4 of Part 1 offers observations on each of the categories, drawing on examples of specific standards tabulated in the Annex.

Finally, in Part II, Section 5 of the paper reviews the potential interplay between plastic standards, standard-setting processes, and the INC and DPP processes. It outlines questions that governments participating in each setting may wish to consider when engaging in any discussion around the development, applicability, or implementation of standards.

PART I. Overview of Standards and Related Initiatives Relevant to Plastics and Plastic Pollution

1. Intergovernmental Initiatives and Government Legislation, Regulations, and Initiatives

1.1 Intergovernmental Initiatives

Intergovernmental initiatives addressing plastic pollution can include (i) binding treaty requirements that concern different stages of the life cycle of plastics and (ii) non-binding initiatives establishing best practices or guidelines relevant to addressing plastic pollution. Each of these are addressed below, with reference to examples presented in the Annex.

Binding Treaty Requirements Addressing Plastic Pollution

One form of intergovernmental cooperation is the negotiation and adoption of international rules through treaties. Treaty making offers the potential for broad cooperation on issues of widespread importance. International legally-binding rules can also provide varying levels of detail and flexibility, including in regard to national implementation. Treaty-making is, however, a complex process: negotiating states have varying interests, and differing capacities to participate, and both negotiation and ratification can take considerable time. Treaties are concluded and implemented between states, although civil society, private actors, and other stakeholders may have the opportunity to engage during negotiations and can support implementation.

A key feature of treaties is that parties are bound to implement their obligations (in contrast to non-binding initiatives, such as voluntary multistakeholder standards discussed in Section 2). Obligations can include, for example, substantive requirements to comply with, or enforce, prohibitions

or other restrictions, or to adopt certain regulations. Parties may also agree to additional obligations such as procedural requirements addressing monitoring and transparency. More generally, treaty obligations can also provide a context for parties to seek or promote the development of voluntary multistakeholder standards or other initiatives that may facilitate treaty objectives, such as criteria or guidance for implementation. While treaties are only binding on parties to them, state parties may implement treaty obligations through domestic regulations that impose requirements on industries, companies, or other actors within their jurisdictions (as discussed in Section 1.2).

Current efforts to negotiate a new international legally binding instrument to end plastic pollution are generating a range of proposals on what kinds and mix of binding obligations, control measures and voluntary measures the treaty should contain, as well as on implementation measures and means of implementation. States have committed to pursuing a “comprehensive” approach that addresses the full life cycle of plastics.⁸ In early negotiations, some delegations have, amongst other proposals, suggested obligations or control measures aiming to eliminate or restrict the production and consumption of certain products, promote sustainable product design, ensure transparency and labelling, and to eliminate or make transparent the use of chemical additives present in plastics. Once concluded, the treaty will complement the current suite of instruments addressing issues related to plastic pollution, including existing international treaties.

8. United Nations Environment Assembly, Resolution 5/14, End plastic pollution: Towards an international legally binding instrument, UNEP/EA.5/Res.14, (March 2, 2022).

The Annex lists illustrative examples of existing international treaty provisions relevant to different stages of the plastics life cycle. A number of these examples cover general obligations that explicitly or implicitly address plastic pollution within the framework of a treaty addressing a broader issue area.⁹ These include several treaties with provisions that address sea-based sources of marine waste, such as:

- A prohibition on disposing of plastic waste into the sea, under Annex V of the International Convention for the Prevention of Marine Pollution from Ships (MARPOL) (entry into force 1983, Annex V in 1988; 158 state parties) (IMO, n.d.).
- A requirement for parties to adopt laws preventing, reducing, and controlling marine pollution by dumping, under the United Nations Convention on the Law of the Sea (UNCLOS) (entry into force 1994; 168 state parties).¹⁰
- A prohibition on dumping any waste into the sea, under the International Maritime Organization (IMO) 1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matters, 1972 (“London Protocol”) (entry into force 2006; 53 state parties).¹¹

Other treaties listed in the Annex impose prohibitions or other requirements concerning specific substances, including substances or products with implications for plastic pollution. The relevant substances are listed in annexes to the main treaty text that parties may review and modify on a regular basis. The examples in the

Annex have implications for the production and waste management stages of the plastics life cycle, and include:

- A requirement to eliminate or restrict persistent organic pollutants (POPs), listed in annexes, under the Stockholm Convention on Persistent Organic Pollutants, a United Nations (UN) treaty (entry into force 2001; 152 signatory state parties).¹² Regulated POPs include certain flame-retardants that may be used in plastic polymers, and other substances relevant to the plastic production process.¹³ Parties may broaden the scope of covered substances under procedures for proposing and adopting amendments to relevant annexes.¹⁴
- Recent “plastic waste amendments” under the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, a UN treaty (entry into force 1992; 190 state parties). The amendments clarify the treaty’s regulation of certain plastic wastes that are characterized as hazardous or requiring special consideration and thereby subject to the prior informed consent procedure¹⁵ as well as those characterized as not hazardous and thus not subject to the procedure (Basel Convention, n.d.-c).¹⁶

In addition to the types of requirements addressed above, certain treaties impose obligations that are benchmarked against external standards. For example, international trade agreements typically incorporate references to international standards

9. These broader issue areas include, among others, the law of the sea, marine waste, chemicals management, persistent organic pollutants, and transboundary waste.

10. Article 210(1) of United Nations Convention on the Law of the Sea, December 10, 1982, U.N.T.S. 397.

11. Article 4 of London Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, Oct. 29, 1972, 26 U.S.T. 2403, T.I.A.S. No. 8165, 13 I.L.M. 546 (entered into force Aug. 5, 1975) (as amended by the 1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, Nov. 7, 1996, 36 I.L.M. 1).

12. Article 1 of Stockholm Convention on Persistent Organic Pollutants, May 22, 2001, 40 I.L.M. 532 (entered into force May 17, 2004).

13. Stockholm Convention (2019). At the eleventh meeting of the Conference of the Parties to the Stockholm Convention (SC COP-11) held in Geneva, Switzerland from 1-12 May 2023, Annex A to the Convention was amended to list three new chemicals therein, namely the pesticide methoxychlor and the industrial chemicals Dechlorane Plus and UV-328. SC COP-11 also adopted a report on progress towards the elimination of polychlorinated biphenyls, which urged Parties to meet their obligations towards the 2025 and 2028 deadlines under the Convention, while recognizing the specific needs and challenges of developing countries (Basel, Rotterdam and Stockholm Conventions (n.d.))

14. Procedures set out in Articles 17, 21 and 22 of Stockholm Convention on Persistent Organic Pollutants. State parties may, at a “Conference of the Parties” held at “regular intervals”, adopt amendments by consensus; or, “as a last resort”, by three-fourths majority vote.

15. A detailed prior informed consent procedure is set out by the Basel Convention “with strict requirements for transboundary movements of hazardous wastes and other wastes. The procedure forms the heart of the Basel Convention control system and is based on four key stages (1) notification; (2) consent and issuance of movement document; (3) transboundary movement; and (4) confirmation of disposal.” (Basel Convention, n.d.-b)

16. Annexes II and VIII of Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, Mar. 22, 1989, 1673 U.N.T.S. 126 (entered into force May 5, 1992). See also Amendments to Annexes II, VIII and IX to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, Mar. 22, 1989, 1673 U.N.T.S. 126 (entered into force May 5, 1992).

Box 1. The WTO TBT Agreement and International Standards

The TBT Agreement requires WTO members to base their domestic “technical regulations” on “relevant international standards” where they exist or where their completion is imminent, except “when such international standards or relevant parts would be an ineffective or inappropriate means for the fulfilment of the legitimate objectives pursued, for instance because of fundamental climatic or geographical factors or fundamental technological problems” (Article 2.4). Further Article 12.4 of the TBT Agreement provides that members recognize that “developing country Members should not be expected to use international standards as a basis for their technical regulations or standards, including test methods, which are not appropriate to their development, financial and trade needs” (WTO, n.d.-d).

It refers to “technical regulations” as documents with which “compliance is mandatory”, and “standards” as documents with which compliance “is not mandatory”; both documents address “characteristics” or their “related processes and production methods”, and which may “include or deal exclusively with terminology, symbols, packaging, marking or labelling requirements as they apply to a product, process or production method” (Annex 1.1 and 1.2, TBT Agreement). Technical regulations that are “in accordance with relevant international standards,” and are also “prepared, adopted, or applied” for a legitimate objective “explicitly mentioned” in Article 2.2 of the TBT Agreement, benefit from a rebuttable presumption under the TBT Agreement that they do not “create an unnecessary obstacle to international trade” (Article 2.5 TBT Agreement).

While the TBT Agreement does not explicitly define a “relevant international standard” for the purposes of the agreement, it provides that terms set out in the TBT Agreement have the same meaning as

those in the ISO/IEC Guide 2: 1991, General Terms and Their Definitions Concerning Standardization and Related Activities (“ISO/IEC Guide 2”), to the extent that definitions in Annex 1 TBT Agreement do not depart from the ISO/IEC Guide 2.¹⁷ On the basis of TBT Agreement, ISO/IEC Guide 2, and the “TBT Committee Decision on Principles for the Development of International Standards, Guides and Recommendations with Relation to Articles 2, 5 and Annex 3 to the Agreement”, the WTO Appellate Body has identified characteristics of an “international” standard as including, for the purposes of the TBT Agreement: adoption by an “international standardizing body”, that “has recognized activities in standardization” (meaning, “at a minimum, that WTO Members are aware, or have reason to expect” that it “is engaged in standardization activities”); and, “whose membership is open to the relevant bodies of at least all Members” “on a non-discriminatory basis” and at “every stage of standards development.”¹⁸ The standard does not, however, need to have been adopted by consensus.¹⁹

At the same time, voluntary multistakeholder standards or standard-setting processes are not, in their own right, restricted to the characteristics set out in the TBT Agreement. They may present independent characteristics, outside those contemplated by the TBT Agreement, such as applicability to services (as opposed to only products and processes), and process-based requirements for consensus (see e.g. ISO and IEC, 2004). However, to the extent that WTO members use those standards as the basis for technical regulations that are governed by the TBT Agreement, they must still ensure that they meet the requirements set out under the TBT Agreement, in order to ensure the consistency of their technical regulations with the TBT Agreement.

17. See Appellate Body Report, US – Tuna II (Mexico), paras. 351-356 of World Trade Organization Appellate Body Report, United States - Measures Concerning the Importation, Marketing and Sale of Tuna and Tuna Products (Second Complaint), AB-2012-11, WT/DS381/AB/R (May 16, 2012) (“US – Tuna II (Mexico”).

18. See paras. 356-364 and 374-375 of Appellate Body Report, US – Tuna II (Mexico).

19. See paras. 222-227 of Appellate Body Report, EC – Trade Description of Sardines, AB-2002-3, WT/DS231/AB/R (September 26, 2002).

under rules governing technical regulations and sanitary and phytosanitary measures, as they relate to trade in goods. These include, at the WTO, the TBT Agreement, which promotes the use of “relevant international standards”, where they exist, as the basis for domestic technical regulations (which may include technical regulations that address plastic pollution).²⁰ Such standards must be established by an “international standardizing body”, that “has recognized activities in standardization” (meaning, “at a minimum, that WTO Members are aware, or have reason to expect” that it “is engaged in standardization activities”); and, “whose membership is open to the relevant bodies of at least all Members” “on a non-discriminatory basis” and at “every stage of standards development.”²¹

Similar requirements can apply in agreements at the regional or bilateral level. For example, Chapter 7 of the EU-Singapore FTA contains a requirement to use international standards as the basis for domestic standards. In Article 4.6 of the FTA, the EU and Singapore “agree to make best use of good regulatory practice with regard to the preparation, adoption and application of technical regulations, as provided for in the TBT Agreement.” This includes, in Article 4.6 (b), “using consistent with Article 2.4 of the TBT Agreement and to the maximum extent possible, relevant international standards as a basis for their technical regulations, except when such international standards would be an ineffective or inappropriate means for the fulfilment of the legitimate objectives pursued; where international standards have not been used as a basis, to explain upon request to the other Party the reasons why such standards have been considered inappropriate or ineffective for the aim pursued” (European Commission, n.d.).

Finally, a number of multilateral environmental agreements also include references to standards, standardization, and standards bodies as well as

criteria and technical specifications, with certain provisions requiring parties to adopt, harmonize, or use certain international standards.²²

Non-Binding Initiatives Addressing Plastics

Intergovernmental processes may also produce voluntary guidelines, or platforms for voluntary commitments, through which states or other actors may take action in relation to plastic pollution. These initiatives may be stand alone, or complement other initiatives, for example by providing guidelines to aid parties to implement related commitments. Examples set out in the Annex illustrate different types of non-binding initiatives, including:

- Guidance to facilitate the implementation of treaty obligations: For example, the Basel Convention Secretariat issued practical guidance on the development of inventories of plastic waste to assist state parties to the Basel Convention in their reporting on implementation measures related to waste management (Basel Convention, 2022). At the sixteenth meeting of the Conference of the Parties to the Basel Convention held in Geneva in 2023, updated technical guidelines on the environmentally sound management of plastic wastes were also adopted (BRS, 2023b).
- Best practices: For example, OSPAR, a marine protection mechanism developed by fifteen North East Atlantic governments and the EU, has set out best practices on the design of fishing gear, as it relates to the use of plastics and waste management, for purposes of recyclability, end-of-life-management, reduced environmental impact, and traceability (OSPAR Commission, 2020). According to OSPAR, this project in turn contributed to the European Commission’s work to develop a standard for the design of fishing gear (a requirement under

20. Article 2 of Agreement on Technical Barriers to Trade, April 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A.

21. Explanation in Appellate Body Report, US – Tuna II (Mexico), paras. 356-364 and 374-375 of World Trade Organization Appellate Body Report, United States - Measures Concerning the Importation, Marketing and Sale of Tuna and Tuna Products (Second Complaint), AB-2012-11, WT/DS381/AB/R (May 16, 2012); and,

22. See for example Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, Mar. 22, 1989, 1673 U.N.T.S. 126 ; Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, Sep. 10, 1998, 2244 U.N.T.S. 337; Stockholm Convention on Persistent Organic Pollutants, May 22, 2001, 2256 U.N.T.S 119 and Montreal Protocol on Substances that Deplete the Ozone Layer, Jan.1, 1987, 1522 U.N.T.S 3.

the SUP Directive), “including through the sharing of information, as well as by helping to identify appropriate experts to consult” (OSPAR Commission, n.d.-b).

- Principles and action plans: For example, the Coordinating Body on the Seas of East Asia (COBSEA), a nine-country mechanism for the development and protection of East Asian seas marine environment and coastal areas, has set out principles and key actions to reduce marine litter, including the harmonization of standards and regulations, and the development of sectoral guidelines (COBSEA, 2019).
- Voluntary codes of conduct: For example, the Food and Agriculture Organization of the United Nations (FAO) has published a proposal for the development of an international voluntary code of conduct addressing the full life cycle of plastic products used in agri-food value chains (FAO, 2022; FAO, 2021, pp. 101-104).

While these initiatives do not carry the legal force of treaty obligations, they may nonetheless play a useful role in articulating shared objectives, facilitating cooperation and information sharing, as well as complementing or working towards more specific or binding forms of cooperation. Because of their non-binding nature, the development of these initiatives may also draw broader participation, and reach a faster resolution, than binding commitments. Non-binding initiatives can also provide scope for parties to assess their applicability within their own jurisdictions, drawing on useful aspects, while leaving aside or adapting less suitable aspects.

1.2 Domestic Legislation, Regulations, and Initiatives

Domestic legislation, regulations, or policy initiatives adopted by governments in individual states, or by supranational organizations vested

with law-making authority (such as in the case of regional organisations), are an important counterpart to the intergovernmental cooperation (described above) as well as voluntary standards (described in Section 2).

Domestic legislation, regulations, and initiatives may serve to implement treaty commitments or other intergovernmental initiatives that aim at reducing plastic pollution, or may reflect or incorporate voluntary standards addressing plastics, making those standards binding on industries, companies, and other actors within the jurisdiction of the regulating state. In so doing, domestic legislation, regulations and initiatives can fulfil the function of transposing cooperation at the international level or in multistakeholder contexts into requirements that apply within a given country.

Alternatively, domestic legislation, regulations and initiatives may establish independent requirements or guidance across a range of regulatory areas associated with plastic pollution. Those measures may, for example, serve to address the specific circumstances of the jurisdiction in question, or address areas that are not the subject of cooperative initiatives at the international level or in a multistakeholder context.

Domestic legislation, regulations and initiatives may also influence international dialogue and cooperation on the development of voluntary standards or intergovernmental initiatives. They form part of the context that informs cooperative efforts, potentially indicating, for example, areas of convergence (where multiple jurisdictions have adopted similar legislation, regulations and initiatives) or divergence (where different jurisdictions have taken contrasting approaches); gaps in domestic legislation, regulations and initiatives might also indicate areas where cooperative efforts could usefully facilitate shared objectives. Individual domestic measures can sometimes provide a blueprint for initiatives at the

international level, to the extent they find broader acceptance amongst participants. Conversely, they may generate sensitivities, for example, in relation to their appropriateness for other jurisdictions that have lower financial and implementation capacities, that have economic sectors that may be disproportionately impacted, or that are concerned about impacts to cross-border trade (see commentary in Part II on discussions concerning technical regulations notified to the TBT Committee for example).

The Annex contains examples of domestic (and supranational) regulatory initiatives with impacts at different stages of the plastics value chain. Following are several illustrative examples from different jurisdictions (which are complemented by general observations on the Annex in Section 4):

- Regulations that include the requirement for importers of certain plastic bags to submit information indicating compliance with ISO 14855 or other applicable standards, adopted by the Seychelles in 2017 (UNEP LEAP, n.d.).
- Regulations that address product design by aiming to reduce “excessive packaging” by restricting the ratio between net content volume and total package volume for food and cosmetic packaging, that will take effect in China in 2023 (Standardization Administration of the People’s Republic of China, 2021).
- Requirements aimed at reducing the impact of single use plastics, including through product design and marketing requirements, adopted by the EU in 2019 (European Parliament and Council, 2019).
- Requirements addressing the manufacture, sale, importation, and use of polythene materials, passed by the Eastern African Community in 2017 (East African Community, 2016).
- Amendments to plastic waste management rules that increased the required thickness of plastic carry bags in order to reduce waste and enable reuse, adopted in India in 2021 (Indian Ministry of Environment, Forest and Climate Change, 2021).

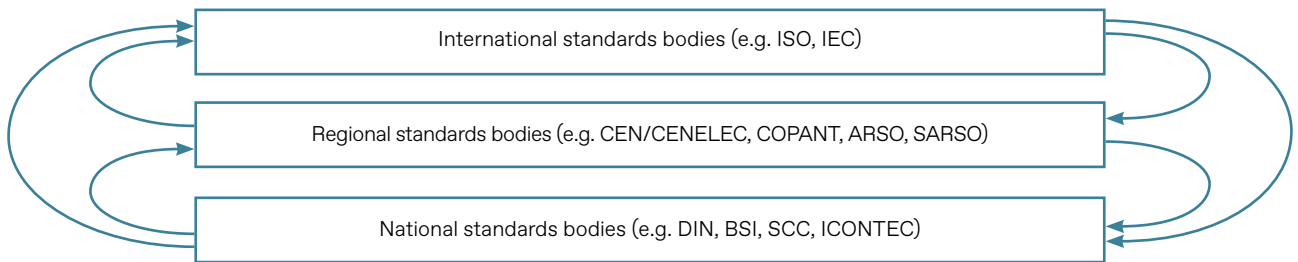
2. Voluntary Multistakeholder Standards

Voluntary multistakeholder standards can be developed at the international, regional, or national level, and each level can inform and/or lead to the development of standards at other levels (Figure 3). That is, an international standard can be adopted at the national level; an international standard can be adopted as a regional standard;²³ a regional or national standard can be transformed into an international standard.

This section begins with an overview of voluntary multistakeholder standards and their development, moving then into a more detailed review of relevant processes at the international, regional and national level. For illustrative purposes, Table 1 highlights some examples of voluntary multistakeholder standards developed at the international, regional, and national level to tackle plastic pollution.

23. In the EU, an international standard can also be simultaneously adopted as a European Standard in accordance with the Vienna Agreement (European Committee for Standardization (CEN), n.d.; German Institute for Standardization (DIN), n.d.).

Figure 3. Interrelations Between Different Levels of Multistakeholder Standards

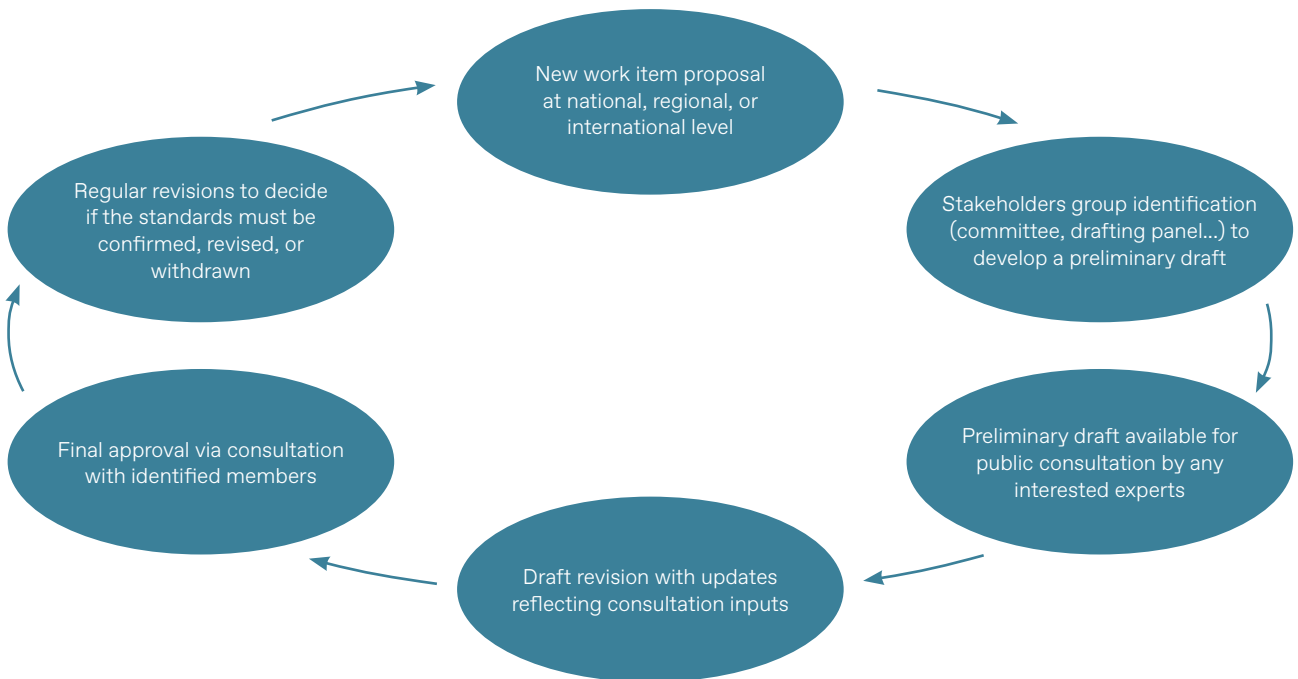


Note: Abbreviations stand for European Committee for Standardization (CEN), European Committee for Electrotechnical Standardization (CENELEC), Pan American Standards Commission (COPANT), African Organisation for Standardisation (ARSO), South Asian Regional Standards Organization (SARSO), German Institute for Standardisation (DIN), British Standards Institution (BSI), Standards Council of Canada (SCC), Colombian Institute of Technical Standards and Certification (ICONTEC).
 Source: International Organization for Standardization.

The processes used for setting voluntary multistakeholder standards are very similar at international, regional, or national level—the notions of stakeholder engagement and consensus are key. At any level, standards development organizations aim to act as neutral convening platform, bringing

together different categories of stakeholders (e.g. academia, civil society, industry, government) to share their expertise and agree on best practices that can be published as standards. Some of the key steps in the voluntary multistakeholder standards development are illustrated in Figure 4.

Figure 4. Steps in Voluntary Multistakeholder Standards Development



Source: International Organization for Standardization.

At the international level, the WTO's TBT Committee has defined a set of principles for the development of international standards (including voluntary multistakeholder standards) that fall within the meaning of "standards, guides and recommendations" referred to in the TBT Agreement.²⁴ These principles—openness, transparency, impartiality and consensus, effectiveness and relevance, coherence, and the development dimension (WTO, n.d.-b)—form the backbone of the standards development process for many organizations that develop voluntary multistakeholder standards (ISO and IEC for example). These same principles form part of good standardization practice more broadly and, as such, are also reflected in the standards development processes used by regional and national standards bodies.

Certain types of international standards addressing sanitary and phytosanitary (SPS) measures are recognized under another area of WTO law: the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement).²⁵ Specifically, the SPS Agreement encourages members to base their measures on the international standards, guidelines, and recommendations, where they exist, of "relevant international organizations," including organizations referred to commonly as the "three sisters,"²⁶ namely the: (i) International

Plant Protection Convention (IPPC) (in relation to plant health); (ii) World Organisation for Animal Health (Office International des Epizooties, OIE) (in relation to animal health and zoonosis); and (iii) Codex Alimentarius Commission (Codex) (in relation to food safety) (see SPS Agreement, Article 3.1 and Annex A(3); WTO, n.d.-c; Australian Government: DAFF, n.d.).²⁷ In particular, where international standards, guidelines, or recommendations do not exist, or where a WTO member's measure results in a higher level of SPS protection than provided by an international standard, guideline, or recommendation, the member must base its SPS measure on a scientific assessment of the risks. Among other obligations, the SPS Agreement requires that risk assessments take into account the risk assessment techniques developed by the relevant international organizations (SPS Agreement, Articles 3 and 5.1; WTO, n.d.-c; Australian Government: DAFF, n.d.).²⁸

The "voluntary" nature of voluntary multistakeholder standards discussed in this section refers to the fact that, by default, stakeholders can choose whether and how to use them. In principle, voluntary standards are not developed to establish, drive, or motivate public policy or regulations, or social or political agendas. They also do not set performance thresholds (these are set by policymakers according to their requirements). The only way these standards can be made mandatory is if lawmakers choose to

24. World Trade Organization (n.d.-b). As noted in section 1.1, the TBT Agreement also sets out requirements that promote the use of "relevant international standards", where they exist, as the basis for the domestic technical regulations of WTO members.

25. The SPS Agreement governs all SPS measures affecting international trade, and defines SPS measures as measures applied for the protection of "animal or plant life or health within the territory" of the WTO member applying the measure against certain forms of risk arising from the "entry, establishment and spread of pests, diseases, disease-carrying organisms or disease-causing organisms"; from "additives, contaminants, toxins or disease-carrying organisms in foods, beverages or feedstuffs"; and from "diseases carried by animals, plants or products thereof, or from the entry, establishment or spread of pests"; SPS measures also include measures against "damage within the territory" of the WTO Member applying the measure "from the entry, establishment or spread of pests" (SPS Agreement, Article 1.1 and Annex A(1)).

26. The SPS Agreement governs all SPS measures affecting international trade, and defines SPS measures as measures applied for the protection of "animal or plant life or health within the territory" of the WTO member applying the measure against certain forms of risk arising from the "entry, establishment and spread of pests, diseases, disease-carrying organisms or disease-causing organisms"; from "additives, contaminants, toxins or disease-carrying organisms in foods, beverages or feedstuffs"; and from "diseases carried by animals, plants or products thereof, or from the entry, establishment or spread of pests"; SPS measures also include measures against "damage within the territory" of the WTO Member applying the measure "from the entry, establishment or spread of pests" (SPS Agreement, Article 1.1 and Annex A(1)).

27. See SPS Agreement, Annex A(3); the definition also includes, for "matters not covered" by the three sisters, "appropriate standards, guidelines and recommendations promulgated by other relevant international organizations open for member to all Members, as identified" by the SPS Committee (SPS Agreement, Annex A(3)(d)).

28. In addition to obligations concerning SPS measures, the SPS Agreement also provides for a relationship between the relevant international standard-setting organisations and the WTO's SPS Committee, whose functions include maintaining "close contact" with the relevant international organizations, and developing a "procedure to monitor the process of international harmonisation and the use of international standards, guidelines or recommendations" (SPS Agreement, Article 12). The SPS Agreement also requires WTO members to "play a full part, within the limits of their resources, in the relevant international organizations and their subsidiary bodies" and in particular certain bodies associated with the "three sisters" (SPS Agreement, Article 3.4).

reference them in regulations. Private companies and other non-governmental entities (discussed in Section 3) might also choose to adopt voluntary multistakeholder standards to guide their own activities.

At the same time, as discussed, there may be situations where governments or other entities are compelled to adopt or adhere to certain voluntary multistakeholder standards. The TBT Agreement strongly encourages members to base their measures on international standards as a means to facilitate trade (WTO, n.d.-d). Under WTO law, governments are required to use existing international standards, where they exist or where their completion is imminent, as a

basis for domestic technical regulations except under certain circumstances (see Box 1).

The adoption of a voluntary multistakeholder standard in one or multiple jurisdictions might also impact cross-border trade in ways that compel governments or companies in other jurisdictions to implement or adhere to the same or similar standards.

The referencing of voluntary standards (particularly international standards) in regulations is widespread and is increasingly considered part of good regulatory practice, due to parallels between the principles of good practice on standards and those of good policymaking practice (OECD, n.d.).

Table 1. Illustrative Examples of Voluntary Multistakeholder Standards Related to Plastic Pollution at the International, Regional, and National Level

Level	Organization	Standards
International	ISO	ISO 15270:2008 Plastics – Guidelines for the recovery and recycling of plastics waste
International	ISO	ISO 18830:2016 Plastics – Determination of aerobic biodegradation of non-floating plastic materials in a seawater/sandy sediment interface
International	ISO	ISO 22526:2020 Plastics – Carbon and environmental footprint of biobased plastics
Regional	European Committee for Standardization (CEN)	EN 15342:2007 Plastics – Recycled Plastics – characterization of polystyrene recyclates
Regional	European Committee for Standardization (CEN)	EN 13432:2000 Packaging – requirements for packaging recoverable through composting and biodegradation
National	British Standards Institution (BSI)	PAS: 510 on plastic pellets/flakes/powder loss throughout the supply chain
National	British Standards Institution (BSI)	PAS 9017:2020 biodegradation of polyolefins in an open-air terrestrial environment (specification)

Source: International Organization for Standardization.

2.1 International Multistakeholder Processes

A number of international multistakeholder organizations develop voluntary standards through the contribution

of experts from countries around the world. The largest and oldest of these organizations are the ISO and IEC. The ISO and IEC are international non-governmental organizations whose members are national standards bodies. They operate under the rule of “one member per

country” and work together, along with the International Telecommunication Union, under the banner of “World Standards Cooperation” to promote and advance a voluntary, consensus-based international standards system (World Standards Cooperation, n.d.). A range of other independent international multistakeholder organisations for standards development exist, each with their own models of membership, stakeholder engagement, and processes for standards development (e.g. ASTM International and the Institute of Electrical and Electronics Engineers, IEEE).

Stakeholders have an opportunity to participate in ISO standards development through their ISO member (i.e. their national standards body) (see Table 2). The ISO classifies its stakeholders into seven categories (industry and commerce; government; consumers; labour; academic and research bodies; standards application organizations; and non-governmental organizations²⁹) and ISO members are responsible for ensuring that all relevant national

stakeholders are able to participate.³⁰ The ISO has a set of best practices on stakeholder engagement that reflect the WTO TBT principles of openness and impartiality, meaning that all relevant stakeholders should have the opportunity to contribute to the elaboration of standards without the interests of any one stakeholder category or country being privileged. Regarding the participation of developing countries, ISO offers targeted support with the goal of ensuring they can effectively participate in international standardization and that their needs are taken into consideration.³¹ Ultimately, however, the inclusivity, quality, and efficiency of the standardization process depends on the capacity of ISO members to engage all relevant stakeholders and ensure representativeness. The ISO cooperates with a wide variety of international organizations.³² These organizations can contribute to the technical work of standards development, although they cannot vote on draft standards (only ISO members can vote, according to the policy of “one country, one vote”).

Table 2. The ISO Standardization Process

Stage	Description
Proposal	Stakeholders submit a proposal for a new standard and ISO members (national standards bodies) vote on whether this proposal should be approved, to establish that 1) there is an international market need and 2) that there are sufficient experts from different countries to develop the standard.
Drafting	When a proposal for a new standard is approved, a draft is then prepared by an international group of experts. These experts are nominated by ISO members for their technical knowledge of the subject. They do not represent a national position. A first layer of consensus is achieved between experts. The draft is then submitted to ISO members for voting and commenting. During this period, ISO members convene their national stakeholders to review the draft, review all comments received, and consolidate these into an official national viewpoint. They then submit their comments and their national vote to ISO, to approve or disapprove the draft standard. This represents a second layer of consensus achieved between countries.
Publication	If the criteria for approval are fulfilled, the draft is published as an international standard. Published standards regularly go through a revision process to ensure they remain relevant.

Source: International Organization for Standardization.

29. Description of the stakeholder categories are available at (n.d.-f).

30. More information on how ISO national standard bodies can engage stakeholders and build consensus is available at ISO (n.d.-c).

31. ISO has an Action Plan for Developing Countries (ISO, 2021) and a Committee on Developing Countries Matters (DEVCO) (ISO, n.d.-a) to support developing country participation.

32. The average time to develop the ISO document with the highest level of consensus, the international standard, is around 30 months. Other deliverables may be developed more quickly, see ISO (n.d.-b).

The ISO process of multilevel engagement and emphasis on consensus building aims to ensure the development of high quality international standards that are globally applicable (in that they represent consensus between countries and between international experts on the scientific state-of-the-art). However, it can also make the process lengthy, especially in cases where consensus is hard to find.³³ As part of Strategy 2030, the ISO is working to regularly revise and upgrade its standards development processes and tools to ensure that standards can be developed in a timely manner without compromising quality.³⁴

In practice, it is not always easy to ensure the effective participation of national standards bodies and stakeholders from developing countries as well as non-profit stakeholders, such as NGOs and civil society organizations, in the standardization drafting processes. For example, many small and medium-sized enterprises lack sufficient human, technical, and financial resources to effectively participate in standardization drafting processes. Nevertheless, many ISO members do have mechanisms to help promote participation from such stakeholders and ISO does provide substantial and targeted support to developing countries. A further point is that international standards, as most national and regional standards, are available for purchase, adding further costs. This cost can pose a potential hurdle to their use by entities with fewer resources. A final observation is that as with any voluntary standard, the fact that a given international standard exists does not provide an indication of the degree to which that standard is used in different markets (its market penetration) or of how the usage of a particular standard may vary depending on region or type of business.

2.2 Regional Multistakeholder Processes

Regional standards organizations are not a homogenous group. Many, but not all, are intergovernmental (see Section 1) and not all of

them develop standards but act as platforms to enable policy dialogue related to standardization, conformity assessment, and trade in the region (Weissingner, 2022). Examples of regional standards organizations that do directly develop regional standards include the European Committee for Standardization (CEN), the European Committee for Electrotechnical Standardization (CENELEC), and the European Telecommunication Standards Institute (ETSI). For these, the drafting and publication of standards substantially mirrors the international standardization process.

Other regional standards organisations generally focus on fostering the participation of their members in international standardization, facilitating the exchange of information and the setting of technical standardization priorities, and promoting the benefits of standards within their region (e.g. the Pacific Area Standards Congress, PASC, and the Pan American Standards Commission, COPANT).

2.3 National Multistakeholder Processes

Most countries have their own national standards bodies, such as the British Standards Institution (United Kingdom), the Standards Council of Canada (Canada), the Standards Administration of China (China), or the Colombian Institute of Technical Standards and Certification (Colombia). Their role is to coordinate the development of national standards, including preparation, publication, sale, and promotion of those standards. They also represent national interests at regional and international standardization levels.

Notably, however, the institutional character of national standards bodies varies. Some national standards bodies are independent bodies mandated by their government while others are part of the governmental structure of their respective countries (ISO, n.d.-f).

33. The average time to develop the ISO document with the highest level of consensus, the international standard, is around 30 months. Other deliverables may be developed more quickly. See ISO (n.d.-b).

34. See the ISO (n.d.-e) Strategy 2030, goal 2 "Meeting global needs".

National standards bodies also vary in terms of their composition and representation. For example, the British Standards Institution characterizes itself as a non-profit distributing company (BSI, n.d.-a), and the German Institute for Standardization (DIN), sees itself as “an independent platform and partner for industry, research institutions, the public sector, consumers and relevant stakeholders to come together to discuss marketability of innovative solutions through standardization” (DIN e. V., n.d.). DIN has an agreement with the German government to be acknowledged as the sole national standards body in their country.

While specific procedures vary by country, the drafting of national standards is generally undertaken by committees of national experts, which are nominated by organizations with an interest in the content or application of standards on a particular topic. In general, participation in that standard-setting process is open to interested individuals or representatives of organisations, who can approach the relevant national standards body to participate. The drafting phase is generally followed by consultations, after which the standard is published. National standards can also be adoptions of regional or international standards, sometimes modified to fit the specific context or needs of the country.

3. Non-Governmental Initiatives

3.1 Private Sector Initiatives

A growing number of businesses are working to address plastic pollution. These efforts include private sector initiatives to develop and use private, voluntary sustainability standards and labelling schemes across value chains through which plastics are produced or in which plastics are used. One characteristic of private sector initiatives is their diversity, with companies making voluntary commitments on a variety of topics, including: supporting plastic clean up and collection efforts; using more recycled content in products; upcycling and downcycling plastic waste into new goods and services; using fewer plastics in global supply chains and eliminating use where possible (reducing plastic footprint); adopting new business models that omit or reduce plastic use (such as reuse and refill models); and promoting and using non-conventional plastics. Private sector commitments can also include efforts to promote circular economy objectives that connect the upstream and

downstream stages of the plastics life cycle, such as through improved product design to facilitate recycling, repair, and reuse of plastics (Kettunen et al., 2019; van der Ven, 2020; Tamminen et al., 2020; Ellen MacArthur Foundation, n.d.; World Economic Forum, 2020; Consumer Goods Forum, 2020).

Another feature of private sector-led processes is the diversity of industry actors and initiatives seeking to develop requirements or innovative best practices, which involve both independent firms, firms working together across a particular supply chain and multistakeholder initiatives. Many of these private sector initiatives may not be self-described as “standards” but are part of internal supply chain requirements or sustainability strategies. Such supply chain requirements may extend to global subsidiaries or suppliers and thus potentially impact international trade.

Examples of private sector initiatives that draw on inputs from multiple private sector stakeholders include:

- **Consumer Goods Forum Coalition of Action on Plastic Waste:** a coalition of 42 companies aiming to develop greater circularity in the development and processing of plastic packaging in the consumer goods industry. To promote packaging redesign, the coalition has developed a series of voluntary guidelines referred to as the “Golden Design Rules” for reduced plastic use and greater recyclability in packaging, which build on existing guidelines, initiatives, and legislation. Members of the coalition have committed to adopt these rules wherever possible, voluntarily implementing design changes by 2025 and reporting annually on progress. Coalition members represent more than 10% of the global plastic packaging market combined (The Consumer Goods Forum, 2021). Commitments can be made on individual rules without endorsing the whole set of rules at the same time. The focus of the Golden Design Rules gives greater importance to improving plastic packaging’s recyclability as opposed to its substitution or reduction in use. This is demonstrated by the number of rules focusing on recyclability (six rules out of nine).
- **Zero Discharge of Harmful Chemicals (ZDHC):** a multistakeholder organization comprising over 170 contributors from across the industry, including brands, suppliers, chemical suppliers, and solution providers and its process on Manufacturing Restricted Substances List (MRSL) (RoadMap to Zero, n.d.).
- **Bluesign:** a science-based risk assessment to identify and regulate harmful substances within the supply chain of textiles (bluesign, n.d.).
- **Apparel and Footwear International RSL Management (AFIRM) Group:** a coalition of 60 international textile and footwear brands working to reduce the use and impact of harmful chemicals in the apparel and footwear supply chain (AFIRM Group, n.d.).

Private sector initiatives are part of the overall effort to address plastic pollution. They can encourage improved production practices and provide a competitive advantage to compliant producers.

However, they also present a number of challenges, particularly for smaller developing country exporters and their integration into global value chains. Notable concerns include the proliferation of private standards creating additional compliance costs, lack of transparency and opportunities for participation in standard-setting processes, inability of small producers to negotiate adequate price premiums or incentives with buyers, and lack of access to finance and technology among others (UNFSS, 2022).

3.2 Other Non-Governmental Initiatives

In addition to private sector initiatives, a range of other non-governmental initiatives aim to use standards to drive engagement to reduce plastic pollution, including initiatives spearheaded by or associated with non-profit organisations and civil society groups. Such processes involving a range of partners may be launched by a single entity, or involve, or evolve into, multistakeholder processes. One example of such a partnership is the PR3 (Partnership to Reuse, Refill, Replace Single-Use Packaging) standard-setting initiative led by Resolve, which integrates participation from public, private, and other stakeholders (Resolve, n.d.-a). The initiative is seeking to activate “interoperable and standardized reuse systems intended for consumer goods as well as food and beverage packaging” through a standard-setting process overseen by a panel open to membership from across sectors (Resolve, n.d.-c).

Other examples of non-governmental initiatives relevant to addressing plastic pollution include beach clean-up guidelines laid out by the Pacific Beach Coalition (n.d.) and the Chain of Custody Standard for Plastics retrieved in the Hydrosphere developed by DNV, an assurance and risk management organization, in partnership with a non-profit organization, The Ocean Cleanup. The Chain of Custody Standard provides certification for compliance with requirements on the traceability and integrity of reclaimed plastic from any body of water and offers proof of the plastic’s origin (DNV, n.d.; The Ocean Cleanup, 2020).

4. Illustrative Compilation and Review of Standards Across the Life Cycle of Plastics

The Annex to this paper provides a set of illustrative examples of standards in each of the three broad categories introduced above as they apply to various stages along the life cycle of plastics. The examples are drawn from a review of publicly available information from standard-setting bodies, government, international organizations, and stakeholder organisations. Notably, the focus of the Annex is on standards relevant to plastics, of which only a portion are focused specifically on tackling plastic pollution. Nonetheless, understanding the wider range of standards that already exists is instructive to indicate where there may be opportunities to bolster the focus on sustainability and plastic pollution priorities. At the same time, the examples listed in the Annex illustrate the diversity of actions that governments and stakeholders are pursuing to specific plastic pollution-related objectives.

In this section, we set out some brief general observations on each category of standards and on the range of objectives associated with the examples listed in the Annex. The illustrative examples in the Annex table can be generally linked to three broad objectives: (i) reduction, elimination, and circularity to tackle plastic pollution; (ii) promotion of environmentally sustainable and effective substitutes; and (iii) crosscutting issues. A general observation is that examples in the Annex highlight that standards can encompass product and process issues. For example, the European Union's EN 13429:2004 specifies requirements regarding plastic packaging reusability. Similarly, Italy's UNI 10667-1:2017 addresses concerns regarding plastic secondary raw materials. Initiatives addressing

production methods include, for example, ISO 22526-1:2020, which addresses the carbon and wider environmental footprint of bio-based products. Additionally, several standards establish processes such as procedures for separation and identification of different polymer waste streams, limiting pellet loss and pollution, management of plastic waste on board ships, and delivery of plastic waste to port facilities. For example, ASTM D5991-17 sets out standard practices to separate PVC contaminants in PET recycled flakes while the British Standards Institution's PAS 510:2021 sets out the appropriate procedures throughout the supply chain to limit plastic pellet, flakes and powder spills, leaks and loss to the environment. Finally, ISO/DIS 24146-1 provides details on the management of waste by boats and their delivery to port facilities so as to avoid marine pollution. These examples in the Annex also demonstrate that standards can impact not only products but also services like recycling and sorting as well as processes such as those related to testing methods or information disclosure.

4.1 Intergovernmental Initiatives and Government Legislation, Regulations, and Initiatives

The intergovernmental initiatives covered in the Annex have been developed in a variety of fora at the international and regional levels.³⁵ As outlined in Section 1.1, they include, in particular, binding requirements that affect plastic pollution as a part of instruments that address broader issue areas (such as law of the sea, marine waste,

35. At the international level, these include, for example, initiatives adopted through the Strategic Approach to International Chemicals Management (SAICM), the Stockholm Convention, the FAO, the Basel Convention, the IMO, the London Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, MARPOL, and the United Nations Environment Assembly (UNEA). At the regional level, these include, for example, initiatives adopted by the OSPAR Commission and COBSEA.

fishing gear, chemicals management, persistent organic pollutants, and transboundary waste). While a handful of the Annex examples address certain upstream aspects of the plastics life cycle (including the design and manufacturing of plastic products), they reflect, overall, the particular concentration of existing intergovernmental efforts at the stage of waste management, including as it relates to the marine environment.³⁶ The Annex likewise highlights examples of intergovernmental resolutions and voluntary guidelines that apply at the waste management stage, in addition to certain guidance addressing fishing gear, specifically, and actions across the plastics life cycle more generally.³⁷

Domestic Legislation, Regulations, and Initiatives

The domestic legislation, regulations and other initiatives covered in the Annex are drawn from a variety of jurisdictions, and provide examples of types of regulations or policies that address plastic pollution, in relation to different stages of the plastics life cycle.³⁸ Each example indicates the approach taken in the adopting jurisdiction; additional research would be required to determine the extent to which the same approach is reflected in the laws or policies of other jurisdictions, including, in particular, across both developed and developing countries.³⁹

The Annex highlights, in particular, a range of examples covering certain downstream segments of the full plastics life cycle, including use and sale, reuse, and refill, as well as activities linked to collection, recovery, sorting, and transportation.⁴⁰ In contrast, upstream examples can be less straightforward to identify. This is, in part, because upstream activities are concentrated in fewer jurisdictions and may involve more contentious areas of governance (for example, measures concerning fossil fuels). In addition, regulations and initiatives affecting the upstream stages may be more diffuse, with only indirect implications for plastics. Some forms of pollution associated with the upstream stages of the plastics life cycle may also be relevant, and targeted by regulations and initiatives aimed at related but broader issue areas such as greenhouse gas emissions.

Given that the plastics industry has been shown to generate greenhouse gases across its life cycle,⁴¹ the carbon footprint associated with upstream stages may be captured by overall laws or regulations related to emissions that target greenhouse gas intensive industries such as petrochemicals.⁴² Additional research could usefully ascertain the extent to which petrochemical producers and other producers along the plastics life cycle are covered by such regulations.⁴³

We also note, more generally, that certain types of regulatory initiatives set out in the Annex

36. See Annex rows 6, 7, and 10.

37. See Annex rows 7 and 13 entries addressing FAO guidelines on fishing gear and on a proposed voluntary code of conduct to guide the life cycle of plastics in the agri-food value chain.

38. As noted in Section 1.2, domestic regulations addressing plastic pollution may incorporate or otherwise relate to other forms of initiatives including voluntary multistakeholder standards and intergovernmental initiatives, or, may impose independent requirements.

39. As noted in Section 1.2, a regulation adopted in one jurisdiction may serve as an example of initiatives that are or could be mirrored in a range of jurisdictions; equally, it could pose a challenge in other jurisdictions with respect, for example, to implementation capacity, domestic economic sectors, or trade.

40. See for example the initiative listed in Annex rows 7, 8, and 9.

41. In the United States alone, it is estimated that the 42 new plastic facilities to be opened since 2019 would release 44 million tonnes of CO₂ equivalent greenhouse gases once they become operational, the equivalent of another twenty seven 500-megawatt coal-fired power plants, by the year 2025 (Beyond Plastics, 2021).

42. Certain types of upstream processes such as fracking of shale gas may release methane, a particularly potent greenhouse gas, while other stages of the plastics life cycle such as cracker plants and associated power plants, polymer manufacturers, and even foamed plastic insulation also contribute to the release of these gases. It is estimated that at least 27 million tonnes of CO₂ equivalent greenhouse gases escape from foamed plastic insulation into the atmosphere (Beyond Plastics, 2021).

43. A further, and related, area for consideration is the relative effectiveness of measures according to their position along the plastics life cycle. For example, it is possible that measures targeting upstream stages that discourage the production of virgin plastic feedstocks or certain types of particularly problematic polymers (e.g. polystyrene) and chemicals (e.g. polyfluorinated alkyl substances) may be more effective in addressing plastic pollution, overall, than downstream measures aimed at effective plastic waste management once the waste has already been generated.

may cover multiple aspects of the plastics life cycle. This is the case, for example, for the European Union Waste Framework Directive, which encompasses multiple stages of waste treatment.⁴⁴ Similarly, the Chinese Taipei measure addressing polyvinyl chloride (PVC) in certain products addresses production as well as import and sale. Certain regulations and initiatives address a more limited grouping of elements in the plastics life cycle, such as Costa Rica's ban on import, marketing, and delivery of expanded polystyrene. The Annex also contains examples of regulations and initiatives that address processes related to problematic plastic products, such as France's regulation to limit industrial pellet loss and Germany's deposit return schemes regulation, which establishes deposit obligation on certain beverage containers. Regulations and Initiatives targeting both upstream and downstream elements of the overall plastics life cycle may be more difficult to cluster where they are aimed not only at manufacturers but also consumers.

4.2 Voluntary Multistakeholder Standards

The Annex covers examples of multistakeholder voluntary standards addressing all segments of the plastics life cycle. Following are several observations based on this illustrative mapping of existing standards.

First, voluntary standards from international and national standard-setting bodies exist for each phase of the life cycle, including polymer production, as well as the manufacturing of plastic products, plastic use, and plastic waste treatment such as recycling and composting. However, the prevalence, purpose and scope of standards for

each phase of the life cycle varies. For instance, standards relevant to polymers cover the technical aspects of polymer production. Only some voluntary standards, for instance, are focused on sustainability dimensions or offer sustainable criteria (for example, such as defining reusable packaging). Second, in terms of quantity, there are fewer standards addressing plastics at the intermediary product and final disposal stages. Plastic waste is often included within more general standards that target household or municipal waste management. One of the first standards addressing intermediate products such as plastic pellets and flakes was recently adopted by the British Standards Institution (PAS 510:2021). Third, stages with notably fewer voluntary standards include the provision and refinement of feedstocks and sales of plastic products. It is possible that the extraction and industrial processes associated with feedstocks might, in time, be more fully addressed by domestic regulation and initiatives that target the extraction of fossil fuels and the production of biomass for various purposes, not just plastics. At the same time, the carbon footprint of various feedstocks is an emerging topic in standardization.⁴⁵ Fourth, the examples in the Annex also highlight that multistakeholder initiatives can encompass product and process requirements. Several multistakeholder initiatives set requirements and definitions on plastic products such as establishing reusability and recycled plastic criteria and carbon footprint assessments.

In Part II, Section 5 we discuss potential questions that participants in international processes may seek to consider in relation to voluntary standards, including how standards can support the global plastics treaty and where new standards may be required.

44. See European Commission (n.d.-b) and European Parliament and Council (2008).

45. Eionet (2021) mentions as a potential concern measurement of the carbon footprint of bio-based plastic and the lack of standards on the topic of land use for biomaterials.

4.3 Non-Governmental Initiatives

The private sector and other non-governmental initiatives set out in the Annex cover a range of activities across the plastics life cycle. The most common are third-party endorsements that are provided through certification, validation, quality marks, or other forms of recognition, for products that meet certain standards or objectives associated with plastic pollution.⁴⁶ Other examples include independent standard-development initiatives, as well as requirements, programmes, or best practice guidance developed by industry groups aimed at facilitating the achievement by companies of certain standards or pollution-related objectives.⁴⁷ Certain organizations have also established transparency initiatives for reporting and information sharing on waste and other relevant topics.⁴⁸

Examples of product standards include those addressing issues such as the certification of recycled plastics and products containing recycled content. For example, the UL 2809 and Scientific Certification Services Recycled Content Standard address plastic products' physical characteristics by certifying to consumers recycled content present in plastic products (UL Solutions, n.d.; SCS Global Services, n.d. & 2014). Other standards focus on process and production methods, such as Control Union's Plastic Free Certification, which seeks to certify to consumers that products, packaging, and materials do not contain fossil-fuel based plastics (Control Union, n.d.).

Concerning non-product related process requirements, the standards identified in the Annex include provisions that address minimizing gear loss, limiting landfill waste, and pellet loss. For example, the Marine Stewardship Council's (MSC) Fisheries Standard 3.0 aims at putting in place effective measures to minimize gear loss and mitigate lost gear impacts (MSC, n.d. & 2022).

From a different perspective, Eurofins' Zero Waste to Landfill Certificate certifies different levels of waste reduction and landfill usage (Eurofins, n.d.). In a similar vein, the Operation Clean Sweep initiative aims at setting appropriate procedures to limit pellet loss by the plastic industry (Operation Clean Sweep, n.d. & 2017).

These initiatives also illustrate that the way in which these standards seek to address plastic pollution may differ. For example, several are aimed at disclosing information and focus on consumers such as the UL 2809 and SCS Recycled Content Standard. Others aim at establishing certain procedures to reduce plastic pollution such as in the case of the MSC Fisheries Standard, Eurofins' Zero Waste to Landfill Certificate, and Operation Clean Sweep.

Alongside plastics-related standards, governments, companies, and non-governmental organizations are making growing use of climate standards and climate-related product labels that differentiate between products based on energy use, greenhouse gas emissions, and carbon footprints. This includes voluntary standards and mandatory requirements to foster an array of "carbon-neutral," "net zero," and "carbon-negative" industrial goods and consumer products, as well as numerous international efforts to establish common standards for issues such as measurement of greenhouse gas emissions and carbon content. Such climate standards are also relevant to an array of plastic inputs, production methods, and products and thus warrant attention as part of the relevant standards landscape. The ISO, for instance, is working to ensure its entire suite of standards embed climate considerations and has published Net Zero Guidelines to, among other objectives, establish common references and definitions relevant to net zero definitions and claims (ISO, n.d.-j).

46. See examples throughout the Annex rows.

47. See certain examples in rows 4, 6, 7, 8, 9, 11, 12, and 13.

48. See certain examples in rows 4 and 14.

PART II. Considerations and Options for International Cooperation on Standards Related to Plastics and Plastics Pollution

5. Key Considerations for International Cooperation

This section sets out key considerations and questions related to international cooperation on standards and related initiatives relevant to governments and stakeholders participating in international processes that aim to tackle plastic pollution, such as the INC process charged with concluding a new plastics treaty and the WTO DPP. Note that this section specifically uses the term “standards” to refer not only to voluntary multistakeholder standards (discussed in Part I, Section 2), but also governmental initiatives at the international level, government legislation, regulations, and other initiatives at the domestic level, and non-governmental initiatives (discussed earlier in Part I, Sections 1 and 3). This general term is also used in reference to outcomes from intergovernmental processes that may: (i) recommend the adoption of existing voluntary multistakeholder standards, or drive the development of new multistakeholder standards in various fora as well as non-governmental initiatives, or (ii) result directly in new binding requirements or non-binding guidelines under international processes.

5.1 The Need for International Cooperation on Standards

A review of the initiatives discussed in previous sections and the illustrative examples presented in the Annex suggest that there is a strong rationale for greater international cooperation on standards across the plastics life cycle. These include, in particular:

- *The diversity and variation in standards across national jurisdictions as well as private sector supply chains*, including regulations and voluntary initiatives. The resulting fragmentation can undermine the global action and cooperation across supply chains needed to address plastic pollution while also increasing costs for producers and exporters that need to comply with a diverse set of national and private sector requirements.
- *Gaps in the coverage of standards*. These gaps can undermine efforts to tackle plastic pollution as well as impede the scale-up of solutions such as reuse or refill systems or the deployment of plastic substitutes.

Cooperation on international standards can take various forms and could be pursued in a range of fora either through binding rules and provisions or the less challenging option of enhanced transparency, soft law approaches, and voluntary pledges and commitments. For participants in the INC, DPP, and other international processes seeking to engage in discussions addressing plastic pollution, a starting point would be to establish principles and priorities to frame and underpin discussions on standards and plastic pollution.

Key principles for consideration could include:⁴⁹

- Environmental credibility and effectiveness of standards, grounded in scientific evidence and the precautionary principle.
- Importance of a life-cycle approach.
- Transparency in standard development

49. These considerations are drawn from the expert views and broader literature relevant to standard setting for environmental purposes, including to address plastic pollution. See for example Deere Birkbeck (2021), Raubenheimer and Urho (2020), Wijkström and McDaniels (2013), and ECOS (2021).

processes including opportunities for stakeholder involvement as well as timely notification and visibility.

- International consultation in the development of standards and international coordination and cooperation in the design and implementation of standards.
- Ensuring that standards are designed in a manner that does not create arbitrary or unjustifiable barriers to trade.
- Ensuring that the concerns of developing countries and their firms regarding their capacity to implement standards are recognized and addressed.
- Inclusiveness in standard development processes.

Key priorities for consideration could include:

- Promoting inclusiveness and effectiveness by improving access to and effective participation in standards development processes by developing countries and their stakeholders, and by environmental organizations.
- Improving cooperation and coordination on standards to promote transparency and manage differences. Options for managing differences may include harmonization through international standards, regulatory cooperation processes, and pursuing mutual recognition of conformity assessment procedures and equivalence of standards and technical regulations. This improved cooperation includes the implementation of standards, including through technical assistance, training, capacity building, technology transfer, investment, and financial support.
- Reviewing and mapping standards in their various forms across the life cycle of plastics, including to identify gaps. Addressing “standards gaps” where additional international standards and criteria will be required, including in regard to product design,

reuse and refill systems, environmental labelling, recycling, and substitute materials.

- Reinforcing and promoting improved cooperation between governments, international organizations, civil society representatives, and the private sector on the implementation of standards, including through technical assistance, training, capacity building, technology transfer, investment, and financial support.

Drawing on these potential principles and priorities, the remainder of this section provides some considerations and options for international cooperation, including in the INC and DPP processes as well as more formal discussions within the TBT Committee at the WTO, while acknowledging the different mandates and the nature of these processes.

5.2 Crosscutting Considerations for International Cooperation

A number of crosscutting considerations for international cooperation on standards and plastic pollution are relevant to the global plastics treaty negotiations and to efforts to tackle trade dimensions of plastic pollution. These include, in particular:

- *Effectiveness in light of plastic pollution objectives*: international cooperation around standards might seek to prioritize any standard-related discussions that may be especially conducive to achieving the objectives set by parties engaged in cooperative processes to address plastic pollution.
- *Transparency and inclusiveness*: international cooperation will require enhanced transparency and inclusivity in standard-setting processes, whether in the context of government regulations or voluntary sustainability standards.

- *Developing country concerns around capacity and adequate financing:* international cooperation will require a focused response to developing country concerns regarding capacity gaps in the design and implementation of standards, including, for example, through financial and technical assistance and transfer of technology. In the INC context, initiatives such as the proposed financial mechanism to support implementation of the treaty will play a key role in addressing capacity concerns.⁵⁰ Governments could also consider bolstering existing initiatives that aim to support developing countries as well as environmental organizations that participate in the design and implementation of standards. These include, for example, the ISO Committee on Developing Country Matters (DEVCO) and the ISO Action Plan for Developing Countries (ISO, n.d.-g; ISO, 2021). Another example is the United Nations Industrial Development Organization's Global Quality and Standards Programme (GQSP) which aims to assist developing countries to boost competitiveness, including in relation to the implementation of standards (UNIDO, n.d.). In the WTO context, the Aid for Trade initiative could prioritize enhanced support for trade-related aspects of standards to address pollution across the plastics life cycle, including by supporting the use and implementation of such standards and by enabling participation in the development of relevant international standards. Aid for trade support could also be channelled through the Standards and Trade Development Facility, a global partnership based at the WTO that promotes improved food safety, animal, and plant health capacity in developing countries (Sugathan, 2022).
- *Cooperation among international processes and initiatives:* international cooperation will entail establishing, strengthening, and sustaining cooperation among diverse

institutions and processes engaged in work relevant to standards and standard-setting. Notable examples include the Basel, Rotterdam, and Stockholm conventions (BRS, 2023a); the Strategic Approach to International Chemicals Management (SAICM) aiming to foster sound management of chemicals throughout their life cycle (SAICM, n.d.); the United Nations Environment Assembly Science Policy Panel on chemicals, waste, and pollution prevention established in 2022 (UNEP, n.d.-a); the United Nations Forum on Sustainability Standards (UNFSS) that addresses the sustainable development value of voluntary sustainability standards by pooling resources, synchronizing efforts, and assuring policy coherence, coordination, and collaboration among UN agencies (UNFSS, n.d.); the WCO's ongoing work on product classification and coding that could enable more granular tracking of trade flows in plastics (WCO, 2022); and work conducted by the International Trade Centre to support the implementation of sustainability standards (ITC, n.d.).

5.3 International Cooperation Through the Global Plastics Treaty

The objective of the INC is the conclusion of an international legally binding instrument on plastic pollution by the end of 2024, addressing the full life cycle of plastics. While neither the INC, nor indeed the final treaty, are currently expected to be responsible for setting standards, the treaty process may develop binding obligations as well as guiding principles or criteria that would shape standard setting and implementation relevant to addressing plastic pollution. It is also possible that governments may over time seek to develop specific commitments or guidance documents for regulatory cooperation through annexes or to cooperate on certain mandatory requirements.

50. Paragraph 4 of United Nations Environment Assembly, Resolution 5/14, End plastic pollution: Towards an international legally binding instrument, UNEP/EA.5/Res 14, (March 7, 2022).

The setting of guiding principles or sustainability criteria for plastics and associated chemicals could also lead to increased transparency and traceability across value chains, better environmental and safety design for products and overall human health, and environmental health benefits.

In advance of the second session of the INC (INC-2) from 29 May–2 June 2023, governments and stakeholders, including international organizations, industry groups, think tanks, and civil society organizations, responded to the call for submissions on possible options for elements of the treaty (UNEP, n.d.-b). Many of these submissions refer to the need, under the core obligations of a global treaty, for globally harmonized definitions, technical standards, and metrics, for both products and processes, including monitoring and reporting. Some submissions are even more specific and call for harmonized design standards and precautionary standards for chemicals and additives in plastics. Standards have also been proposed as a tool under the means of implementation of treaty measures (UNEP, n.d.-b; UNEP, 2023a).

The importance and advantages of using international standards was also emphasized by ISO in its submission to INC-2. These advantages include representing international best practices. The ISO submission also recognizes the widespread use of international standards including in regulation and conformity assessment and the fact that their use helps to avoid unnecessary barriers to trade, thereby ensuring compliance with obligations under the WTO's TBT Agreement. The submission recommends the establishment and use of common international standards across the full life cycle of plastics (including on the design, production, consumption, reuse, recycling, trade, and disposal of plastics) and states that this would be an important objective if the instrument is to achieve the reduction or elimination of plastic pollution, while creating a level playing field for all states (ISO, 2023).

During the course of discussions at the second session of the INC (INC-2) in June 2023, a number of governments and stakeholders emphasized the importance of the development of common standards and criteria, with the aim of achieving sustainable consumption and production (UNEP, 2023b). They also discussed the relevance of standards to obligations to be agreed within a global plastics treaty. Issues raised during discussions at INC-2 included:

- The need for international obligations and standards to support transparency across the life cycle of plastics, including of the material and chemical composition of products.
- The application of harmonized product design standards, certifications, and requirements to encourage reduce, reuse, and repair of plastic products and packaging.
- The importance of standards for recycling, waste management, and remediation, including on issues such as best available technologies and environmental practices.

As part of work to be undertaken between INC sessions, some governments also called for:

- The “compilation of existing standards on sustainability of alternatives and which could be reflected in design criteria.”
- The compilation of “existing standards and certification that verify plastic circularity.”
- The clarification of definitions and criteria for identifying various types of plastics, plastic products, and substances, including specific problematic and avoidable plastic products for ban, phase-out, reduce or control of the production, sale, distribution, trade, and use (UNEP, 2023b).

Regarding the means of implementation, there was broad support among a range of governments at INC-2 for cooperation and coordination with a range of entities, including standards-setting organizations such as ISO and ASTM International. Discussions at INC-2 also highlighted that a global plastics

treaty should ensure complementarity with existing multilateral environmental agreements as well as other international agreements, particularly in relation to legally binding obligations, and that cooperation and coordination processes under multilateral environmental agreements such as the Minamata Convention and the BRS conventions could serve as models for the global plastics treaty (UNEP, 2023c).

Governments and stakeholders in the treaty negotiations process have several different potential pathways for addressing standards. As a starting point, existing government regulations and initiatives, voluntary standards, and private sector standards form an important repository of knowledge and best practices, and constitute a diverse set of ready-made tools for use in different settings to address plastic pollution. Looking forward, governments and stakeholders may seek to further develop, coordinate, harmonize, implement, or otherwise support international cooperation in relation to standards. This could happen through the plastics treaty process directly (for example, if the text of the criteria encourages or creates obligations to use international standards or discusses criteria that could guide the development of standards around the production or composition of certain products that may be updated over time⁵¹) or be spurred by it (for example, if the negotiations identify gaps where the development of new standards, either stand-alone or those required to support national or regional legislation, are needed to provide solutions).

Governments and stakeholders could also review—including as part of a proposed multistakeholder action agenda to end plastic pollution⁵²—the current implementation of government regulations and initiatives, voluntary standards, and private initiatives to see what lessons can be learned

about how to improve standard-setting processes and ensure adequate technical and financial assistance for developing countries.

As governments and stakeholders deepen their discussions on core treaty obligations and implementation, they may wish to consider the following questions related to standards. The first question addresses the general relevance of standards to objectives identified in the INC process, while the following two questions serve to assess the suitability and application of relevant standards. Where relevant, the questions distinguish between government legislation, regulations, and initiatives, voluntary multistakeholder standards, and non-governmental initiatives.

How Are Standards Relevant to Achieving Objectives Within the INC Process?

In the INC process, governments and stakeholders have discussed the need for standards across the life cycle of plastics, covering issues from product design and labelling, to transparency, circularity, and recycling, and where voluntary standards may fit within the context of a range of other policies or regulatory measures.

A number of recent submissions from governments to the INC Secretariat regarding options for elements of the treaty highlight the importance of international cooperation on criteria that could guide the possible development of new standards and the identification of existing standards needed to support various potential obligations in the plastics treaty.⁵³ Table 3 presents a sample of illustrative examples. Notably, not all existing standards are adequate and there are important gaps that warrant attention.

51. See for example Nordic Council of Ministers (2020), BRS (2023), and the pre-session submission to the second session of the INC by Norway and Rwanda as co-chairs of the High Ambition Coalition to End Plastic Pollution (High Ambition Coalition to End Plastic Pollution, 2023).

52. United Nations Environment Programme, Approach for the multi-stakeholder action agenda to end plastic pollution (Submitted by UNEP), UNEP/PP/INC.1/INF/11, November 16, 2022.

53. For example, in their pre-session submission to (INC-2, Norway and Rwanda as co-chairs of the High Ambition Coalition to End Plastic Pollution state that the treaty must ensure criteria for the design of plastics to extend product lifespan and ensure durability, recyclability, and safety in order to enable a circular economy for plastics that protects the environment and human health. Such criteria could be set in the treaty annex and include durability, reliability, reusability, reparability, absence of substances of concern, microplastic content and potential for its release, minimum recycled content, possibility of remanufacturing and recycling, as well as expected generation of waste. These criteria could be applied in respect of any product characteristics, such as, for example, composition, performance, shape, packaging, and labelling. The submission also states that each party should be required to take effective measures to ensure that plastic products are produced, manufactured, and put on the market in line with the criteria. Such measures could also include minimum requirements, technical regulations, and standards (High Ambition Coalition to End Plastic Pollution, 2023).

As part of their reflection on the relevance of standards to the plastics treaty, a focus area for governments and stakeholders could be to identify

key areas in which international cooperation and a coordinated response around standards is most critical to addressing relevant objectives.

Table 3. Illustrative Examples of Standards Relevant to Potential Elements of the Plastics Treaty

Potential Elements of the Plastics Treaty	Examples of Relevant Standards
Obligations to reduce or eliminate harmful, problematic, or unnecessary plastics	<ul style="list-style-type: none"> ■ Standards related to product identification, design, transparency of material composition, and labelling. ■ Quality standards for recycled plastics. ■ Standards related to conformity assessment, testing, inspection, validation, and certification. ■ Standards for environmentally sound non-plastic substitutes.
Obligations to support a circular economy	<ul style="list-style-type: none"> ■ Standards related to circular economy and circular economy management frameworks. ■ Standards for re-use, and re-use/refill product delivery systems.
Obligations to reduce plastic waste in the marine environment	<ul style="list-style-type: none"> ■ Standards for collection, sorting of waste on ships, and delivery to port facilities. ■ Intergovernmental rules and action plans on dumping of waste and waste management in marine environments.

Source: INC submissions by governments.

Which Existing Standards Are Relevant?

This second question requires consideration of the range of government legislation, regulations, and initiatives, multistakeholder voluntary standards, and non-governmental initiatives (examples of which are set out in the Annex and described in sections 1–4). Governments and stakeholders will need to review and assess whether and which existing standards are relevant, suitable, and sufficient for achieving the various objectives of the plastics treaty. Issues for consideration include:

- How the standard was developed, including environmental credibility.

- How easy/difficult it is to apply the standard across different jurisdictions.
- What support developing countries and their businesses would require to effectively implement the standard.
- Whether there are socio-economic, health, and environmental risks associated with the standard, including indirect effects.
- Whether there are alternative or complementary approaches to reaching the treaty objective (e.g. technical solutions like digital product passports or legal solutions such as plastic bans).

Where Are Additional Standards Needed?

In light of issues raised around the relevance of existing standards, governments and stakeholders could consider whether to recommend the development of new standards. In the case of government efforts, this could include new regulations, voluntary guidelines, or best practices. In the case of voluntary standards, this could include new international standards, efforts to better coordinate national standards (which might be better suited to specific local circumstances), or new regional standards. A key consideration will be how to design processes or mechanisms at the national and international level for effective coordination and cooperation to prevent conflict between standards and fragmentation.

Governments and stakeholders may thus wish to provide recommendations: (i) on the development of new standards (or revision of existing standards) that could support treaty goals (Table 4); and (ii) on the process of standard setting ensuring it is consensus-based, inclusive, and takes into consideration the needs of developing countries.

With respect to the different stages of the plastics life cycle where additional standards may be needed, there is a greater concentration of regulations and voluntary standards in downstream segments of the plastics life cycle compared to upstream segments (e.g. the production of primary plastics) as well as for plastic substitutes and refill or reuse models (Schuyler et al., 2022). Downstream stages may benefit from additional standards that complement or expand existing standards.

Table 4. Examples of New or Potential Standards That Could Support Potential Elements of the Plastics Treaty

Potential Elements of the Plastics Treaty	Examples of Relevant Standards
Obligations to reduce or eliminate harmful, problematic, or unnecessary plastics	<ul style="list-style-type: none"> Standards for toxic limit levels and testing (e.g. toxic concentration in recycle), applicable at product design stage in relation to additives and hazardous chemicals in them (GAIA, 2022). Standards for preventing and reducing plastic packaging as well as restricting excessive plastic packaging. Standards for establishing a plastic footprint methodology.
Obligations to facilitate reuse of plastic products and reuse systems	<ul style="list-style-type: none"> Standards establishing definitions of remanufactured goods. Standards establishing definitions and approaches for reuse systems.
Reducing existing plastic pollution	<ul style="list-style-type: none"> Standards applicable to environmentally sound and safe clean up and remediation (e.g. in the marine environment).

Source: INC submission by governments and stakeholders.

5.4 International Cooperation Through the WTO Dialogue on Plastics Pollution and Other WTO Processes

At the WTO, DPP discussions are expected to pave the way for voluntary pledges of individual and collective action. Discussion within this forum could result in efforts to enhance international trade-led cooperation to address plastic pollution, which can complement and support the plastics treaty process.

Unlike in the INC process, the DPP outcomes are expected to be of a voluntary nature and not legally binding. The scope of DPP discussions is also narrower than the INC because members have focused their work on trade-related dimensions. Already, discussions in the DPP have highlighted the importance of international cooperation on standards, as these have numerous implications for trade and because reducing plastic pollution will require cross-border cooperation along international value chains. A broad range of standards have been discussed, including in the context of public regulations, as well as voluntary and private initiatives. At the DPP, participants have also noted that standards could help to reduce plastic pollution through a range of different pathways, from the promotion of non-plastic substitutes to waste management and recycling technologies, services involving reuse and refill business models, and the reduction and phase out of specific plastics.

Certain stakeholders active in the DPP have raised the topic of standards in reference to the need for recycling standards;⁵⁴ the need to work on standardization processes with relevant standards-

setting organizations such as the ISO, IEC, International Telecommunication Union, OECD, and others, depending on the area (WTO, 2022c); harmonized nomenclature and standardized design and eco-labelling for plastics (WTO, 2022h); standardization for plastics materials and feedstocks (WTO, 2022i); and enhanced cooperation on standards to avoid regulatory fragmentation (WTO, 2022h). Stakeholders such as Nestlé (WTO, 2022e), the Consumer Goods Forum (WTO, 2022f), and Plastic Recyclers Europe (WTO, 2022d) have also shared experiences from private sector initiatives.

The 2021 ministerial statement of the WTO DPP also contains a number of provisions that identify avenues for trade delegates to discuss enhancing transparency and cooperation around trade-related standards. These include:

- “Enhancing cooperation with other international organizations in areas such as definitions, scope, standards, design and labelling for plastics (including plastic packaging) and capacity building that would promote a more environmentally sustainable plastics sector, including through relevant international processes, and intensifying our work and continued cooperation on areas of common interest, such as the ongoing discussions towards a new global instrument on plastics at UNEA-5, the International Organization for Standardization (ISO) and the Basel Convention.
- Identifying effective trade policies or measures to support the implementation of actions under other international processes and efforts and strengthening cooperation and policy coherence within rules and mechanisms of the WTO.

54. For example in the pre-pleenary meeting of the DPP on 16 February 2023, the Basel Convention Secretariat emphasized the need for a clear standard for defining a reusable product and the World Bank referred to a call by 10 ASEAN member states for Standards and Guidebooks on Responsible Plastic Waste Trade (TESS internal notes). Other issues raised include the need for harmonized terms and definitions (CIEL) (WTO, 2022g), discussion on potential alignment of standards (OECD) (WTO, 2022c), best practices on the use of international standards and labelling (IISD) (WTO, 2022c), the need for ISO standards for plastic substitutes such as bamboo and rattan (International Bamboo and Rattan Organization), the need for standards to promote transparency of the material composition of plastics entering countries at the border (TESS) (WTO, 2022d), and having a common understanding of labelling on recyclability linked to an international standard that addresses recycled content (Plastic Recyclers Europe) (WTO, 2022d).

- Identifying actions needed to improve gathering of data on trade flows and supply chains, including by utilizing the Harmonized Commodity Description and Coding System (HS Convention) of the World Customs Organization or other trade instruments or standards, such as UN/CEFACT, and the flow of information about the chemical and material characteristics of plastic products traded internationally.”⁵⁵

A discussion on standards could facilitate progress on topics highlighted in the DPP 2021 ministerial statement. Examples include identifying ways to enhance transparency regarding trade policies relevant to reducing plastic pollution, sharing experiences of effective approaches to move towards more circular, resource efficient, and environmentally sustainable plastics trade, and addressing trade-related capacity building and technical assistance needs of developing members, in particular least developed members and vulnerable small-island developing states.⁵⁶

WTO members may also have an interest in standards-related discussions in light of potential connections between their own domestic measures and standards. A DPP survey on Trade-related Measures on Plastic Pollution has identified a number of measures applied by WTO members, many of which may be supported by standards. These include, among others: eco-design measures; national standard requirements restricting excessive packaging in foods and cosmetics; requirements applicable to “end-of-life” properties of packaging (recyclability, compostability); requirements applicable to minimum thickness, (re)usability, and minimum recycled content in packaging; restrictions on certain polymers, additives, or colouring; and grading and labelling systems for packaging recyclability (WTO, 2022d).

Questions that governments and stakeholders may wish to consider in the context of the DPP are:

- Is the level of transparency around existing and potential standards that are relevant to ending plastic pollution adequate? This includes, for example, transparency in existing standard-setting processes including opportunities to participate and contribute inputs, ensuring transparency around opportunities to contribute towards identifying new areas of standards development. They could also include transparency on the implementation of standards by governments and industry and other procedural aspects such as timely notification of standards once developed to stakeholders that could be affected (such as exporters).
- How can cooperation be enhanced with ongoing processes such as the INC and the work of the Basel Convention? How can collaboration and cooperation on standards be strengthened between the WTO and other international organizations such as the ISO, regional and national standard-setting bodies, industry associations, and private sector entities?
- How can cooperation between individual member states be further strengthened (including through existing WTO committees such as the TBT Committee and other committees that may be deemed relevant) so that national standard-setting processes designed to address plastic pollution do not create unnecessary obstacles to trade or additional compliance-related costs and burdens for exporters?

These three questions could be discussed either in the context of the two specific thematic DPP workstreams—namely Promoting Trade to Tackle Plastic Pollution as well as Circularity and Reduction to Tackle Plastic Pollution—if they relate to specific issues relevant to these workstreams.

55. World Trade Organization, Ministerial Statement on Plastics Pollution and Environmentally Sustainable Plastics Trade, WTO Doc. WT/MIN (21)/8/Rev.2 (December 10, 2021).

56. Ibid.

Alternatively they could also be addressed as relevant under the third DPP workstream dealing with crosscutting issues including topics such as capacity building and technical assistance, fostering international cooperation on transparency and data, cooperation and collaboration with other international organizations and processes, and collective approaches (Deere Birkbeck et al., 2022).

Notably, discussions on standards and technical regulations relevant to plastics are taking place in the WTO's TBT Committee. The TBT Agreement obliges WTO members to alert trading partners about proposed new measures or changes to existing measures through regular notifications. Members may then raise questions or specific trade concerns about the measure in the TBT Committee.

Since 2015, there has been a rise in notifications to the WTO of measures specifically targeting plastics (as opposed to more “horizontal” measures and policies that apply to a wider basket of goods or material inputs, including but not limited to plastics). More than half (59%) of the plastics-related notifications between 2009 and 2021 were made up of technical barriers to trade in the form of technical regulations and specifications (56%) or conformity assessment procedures (14%) (WTO, n.d.-d; WTO, 2020). UNCTAD has noted that the rise in plastic-related measures reflects growing efforts of governments to tackle plastic pollution.

There has been growing interest in plastic pollution-related regulations among WTO members and they have engaged actively with each other and external stakeholders to share and learn from experiences and good practices (WTO, 2023). Alongside the focus on harnessing regulations to tackle plastic pollution, discussions also reflect the fact that these measures can impact trade and exports in particular sectors. For instance, both developed and developing countries

have raised concerns about transparency, onerous requirements, complex criteria, and data gathering requirements associated with the growing range of environmental standards across international jurisdictions as well as the time frames that exporters have to adjust.⁵⁷ Developing countries have underlined the importance of understanding the implications of these measures for their exporters, prior consultation before the introduction of new measures, and ensuring support for implementation and compliance. Cooperation on technical and financial assistance and access to technologies will play a critical role here.

The TBT Committee could play a role in supporting cooperation on trade-related standards relevant to plastic pollution through, for example, a decision by members to review the landscape of new global, regional, or national voluntary standards and technical regulations that could emerge to address plastic pollution and trade-related challenges. Members could examine how international cooperation could be strengthened, including on the development of standards and on capacity building measures to help WTO members implement and comply with them. In these respects, the considerations set out in subsection 5.2, on the questions related to existing and additional standards, may also be relevant to processes at the WTO.

Other committees and councils that may be relevant to discussing standards to address plastic pollution include:

- the Committee on Sanitary and Phytosanitary Measures (SPS Committee) given the health related implications of the presence of plastics and microplastics in the food chain;
- the Council on Trade in Services, given that standards could be developed around reuse and refill that may have trade implications for global service companies interested in providing such services on a cross-border basis; and

57. See for example Committee on Technical Barriers to Trade, Minutes of the meeting of 10-12 November 2021: Note by Secretariat. WTO Doc. G/TBT/M/85. (February 2, 2022) and WTO Specific Trade Concerns database (research criteria: HS Code: 39 -Plastics and Articles Thereof or keyword “plastics”) (WTO, n.d.-e).

- the Committee on Government Procurement given the relevance of standards used in government procurement to shape markets and trade flows for more sustainable products and services.

The SPS Committee, in particular, has seen a number of notifications around domestic measures including standards adopted by members on packaging to ensure food safety and quality. These include requiring the use of plastic packaging for storing and transporting certain types of food products.⁵⁸ SPS measures may also be relevant to plastic pollution efforts where they involve the use of packaging

materials made of non-plastic substitutes. Exporters of packaging materials made of jute, abaca, coir, kenaf, and sisal fibres may face SPS measures, for example, on the use of chemical products such as methyl bromide used to fumigate fibres placed in wooden crates or packed in wooden pellets (noting that while some countries ban methyl bromide, others have permitted it given difficulties in finding alternative low-cost fumigants to deal with a large number of pests) (UNCTAD, 2021). While they do not directly address plastics, such SPS measures could indirectly affect the rate of replacement of plastic materials in international trade with their non-plastic packaging alternatives made of natural fibres.

Conclusion

This paper has sought to shed light on the diversity of “standards” relevant to international efforts to end plastic pollution and the role that they can play in supporting and shaping efforts at the global, regional and national level. It has highlighted that a range of different actions are covered by the way in which the term standards is used in policy discussions around the environment generally and plastic pollution specifically. This paper has thus sought to provide an overview of that wider landscape, including governmental actions (at the intergovernmental level and also at the domestic level), as well as voluntary multistakeholder standards and non-governmental, including private sector initiatives. The paper has provided illustrative examples of standards relevant to addressing plastic pollution across the life cycle of plastics to ground discussion of this topic, and has also shown that there are a range of gaps and shortfalls in terms of

scope, coverage, and concordance between existing standards aimed at addressing pollution across the plastics life cycle. It has also made observations on relevant standard-setting processes such as transparency and addressing the participation and concerns of developing countries and the diversity of relevant stakeholders.

Finally, this paper has emphasized the important role that international cooperation on standards can play in addressing many of these gaps, shortfalls, and considerations. If participants decide to address standards through the potential avenues discussed in sections 5.3 and 5.4, the INC and DPP processes could give form to a variety of actions involving international cooperation on standards. Table 5 offers examples of potential pathways for standards-related cooperation through different international processes.

58. For example, the Draft Code of Practice for packaging and transport of fresh fruit and vegetables introduced by the Tanzania Bureau of Standards provides for the sealing of individual consumer packs, shipping containers, or pallet loads of containers with plastic film or bags so as to reduce oxygen and increase carbon dioxide levels. This reduces produce respiration and slows the ripening process for various fruits (Tanzania Bureau of Standards, 2023).

Table 5. Examples of Potential Actions to Support International Cooperation on Standards

Type of Standard	Potential Actions to Support International Cooperation on Standards
Government legislation, regulations, and initiatives	<p><i>Intergovernmental initiatives</i></p> <ul style="list-style-type: none"> ■ Consider adoption or reference to guidelines and best practices for standard setting (such as the Code of Good Practice for the Preparation, Adoption and Application of Standards annexed to the WTO TBT Agreement). ■ Consider a commitment or other provision in the plastics treaty which addresses participation by governments in the development, adoption, or implementation of relevant existing international standards. ■ Commit to international coordination of national standards and regulations, guided by the treaty obligations and any criteria developed in the treaty process. <p><i>Domestic legislation, regulations, and initiatives</i></p> <ul style="list-style-type: none"> ■ Assess existing domestic regulations across jurisdictions to identify areas of shared acceptance, or divergence, on legislation and regulations to facilitate cooperation. ■ Consider, including for information sharing and capacity development under a new global plastics treaty, innovative domestic regulations that meet process objectives for further scale-up or recommended for global adoption while being suitably adapted to local circumstances prevailing in different countries. ■ Develop and implement domestic legislation, regulations, and initiatives in ways that support international cooperation (such as through consultation and transparency), including to implement the forthcoming global plastics treaty and the national action plans it is expected to deliver.
Voluntary multistakeholder standards	<ul style="list-style-type: none"> ■ Conduct a review of existing voluntary international standards on plastics and plastic pollution in light of evolving priorities to ensure these are based on the latest evidence and are deemed effective for addressing global plastic pollution reduction priorities. ■ Promote the use of existing voluntary international standards that have been developed in accordance with the WTO TBT guidelines that are relevant to reducing plastic pollution; with an accompanying emphasis on building capacity and financial support for implementation, especially in developing countries. ■ Promote cooperation with other relevant international processes and organisations to identify where additional or updated standards are needed and how to support implementation (e.g. explore where and how existing or updated ISO standards could support efforts to update the WCO Harmonized System to better enable monitoring and regulation of cross-border flows of plastics). ■ Take action to ensure stronger inclusiveness of developing countries and non-state actors in international standard-setting. ■ Agree to cooperate on the development of new voluntary international standards on specific aspects of plastic pollution, as a complement to other outcomes. ■ Incorporate relevant standards, or cross-reference particular standards, as part of binding plastics treaty commitments (e.g. in an annex that can be updated over time or in non-binding best practices or guidelines developed to support its implementation). ■ Agree to a process of critical review and updating of existing voluntary standards to ensure these are fit for purpose and reflect the latest scientific evidence and goals of the plastics treaty.⁵⁹
Non-governmental initiatives	<ul style="list-style-type: none"> ■ Promote transparency by compiling and assessing information on non-governmental initiatives related to different phases of the life cycle of plastics. ■ Identify innovative and effective private sustainability standards, including areas of complementarity with other existing or potential multistakeholder or government initiatives. ■ Increase cooperation between governments and non-governmental actors to enable greater transparency of private standards, including of their trade implications.

59. This could be done through a scientific body to a global plastics treaty (BRS, 2023a).

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ANNEX. Key Stages in the Life Cycle of Plastics: Illustrative Examples of Standards and Related Initiatives

Table A1. Key Stages in the Life Cycle of Plastics: Illustrative Examples of Government Legislation, Regulations, and Initiatives, Voluntary Multistakeholder Standards, and Non-Governmental Initiatives*

Stages in the Plastics Life Cycle	Government Legislation, Regulations, and Initiatives (A) Intergovernmental initiatives (B) Domestic ⁶⁰ legislation, regulations, ⁶¹ and initiatives (e.g. non-mandatory guidelines)	Voluntary Multistakeholder Standards	Non-Governmental Initiatives
1. Discovery, extraction, and provision of feedstocks ⁶²	<p>(B) DOMESTIC</p> <p>European Union - <i>Policy framework on biobased, biodegradable and compostable plastics</i> - addresses sources used as carbon feedstock for plastics, and in particular the use of renewable carbon from “sustainably sourced biomass”⁶³</p>	<p>ISO - <i>22526-1:2020 Plastics - Carbon and environmental footprint of biobased plastics - Part 1: General principles</i> - (Standard elaborating on the carbon footprint of bio-based feedstock)⁶⁴</p>	<p>Roundtable on Sustainable Biomaterials (RSB) - RSB Global Advanced Products Certification - Aims to enable “certification of non-energy products like plastics” from: “[b]io-based feedstock (primary biomass and biogenic portion of end-of-life products and production residues)”; “[r]ecycled carbon (non-biogenic end-of-life products or production residues)”; “reduction systems that process bio-based feedstock”⁶⁵</p> <p>REDcert² (REDcert-DE and REDcert-EU) - Sustainability certification of biomass, biofuels and bioliquids - Certification system for “sustainable biomass, biofuels and bioliquids”, and certain types of sustainable agricultural raw materials and biomass; can apply to all steps of process from production / collection of input materials to oil mill processing, to biofuel and liquid biofuel production⁶⁶</p>
2. Refining and production of feedstocks ⁶⁷	<p>(B) DOMESTIC</p> <p>Canada - <i>Guidelines for Determining the Acceptability and Use of Recycled Plastics in Food Packaging Applications</i> - address, among other aspects of recycling process, the “source of feedstock (materials to be recycled)”⁶⁸</p>	<p>ASTM - <i>D2505-88(2015) Standard Test Method for Ethylene, Other Hydrocarbons, and Carbon Dioxide in High-Purity Ethylene by Gas Chromatography</i>⁶⁹</p>	<p>American Chemistry Council (ACC) - RC14001-Responsible Care Standard - meant for organizations that want to attain ISO 14001 certification, and ACC’s Responsible Care Management System (RCMS) requirements; certification is focused on chemical companies and suppliers, including ethylene, propylene production– no need to be ACC member⁷⁰</p>

* The annex table footnotes can be found at the end of the table on pages 71 and 72.

Stages in the Plastics Life Cycle	Government Legislation, Regulations, and Initiatives (A) Intergovernmental initiatives (B) Domestic ⁶⁰ legislation, regulations, ⁶¹ and initiatives (e.g. non-mandatory guidelines)	Voluntary Multistakeholder Standards	Non-Governmental Initiatives
<p>3. Polymer production</p> <p><i>(including of virgin raw materials; secondary raw materials; recyclability)</i></p>	<p>(B) DOMESTIC</p> <p>China - Environmental protection control standard for imported solid wastes as raw materials - Waste and scrap of plastics - GB 16487.12 (2017) (B) - sets out environmental protection control requirements for imported waste and scrap of plastics⁷²</p> <p>European Union - Directive 2010/75/EU on Industrial Emissions (integrated pollution prevention and control) - Annex I, 4.1 (h) covers the production of plastic materials (polymers, synthetic fibres and cellulose-based fibres)⁷³</p>	<p>ISO - 11357-1:2016 - Plastics - Differential scanning calorimetry (DSC) - Part 1: General principles - General test method used in polymer production. Facilitates characterization of plastic waste for the production of recycled polymers⁷⁴</p> <p>ISO - 1133-1:2011 - Plastics - Determination of the melt mass-flow rate (MFR) and melt volume-flow rate (MVR) of thermoplastics - Part 1: Standard method - Measurement concerning plastic from recycled plastics⁷⁵</p> <p>ISO - 15512:2019 - Plastics - Determination of water content - Important to identify moisture rate in plastics - important for bio-based and recycled plastics⁷⁶</p> <p>ASTM - D4976-12a (2020) - Standard Specification for Polyethylene Plastics Molding and Extrusion Materials - Standard on plastic production process⁷⁷</p> <p>United Kingdom - BS 2782-0:2011 - Methods of testing plastic - Standards necessary for testing plastics characterized during production process⁷⁸</p> <p>ASTM - D1238-10 - Standard Test Method for Melt Flow Rates of Thermoplastics by Extrusion Plastomer - Important measurement concerning plastic from recycled plastics⁷⁹</p> <p>ASTM - D3895 - Standard Test Method for Oxidative-Induction Time of Polyolefins by Differential Scanning Calorimetry - General test method used in polymer production. Facilitates characterization of plastic waste for the production of recycled polymers.⁸⁰</p> <p>ASTM - D6869-17 - Standard Test Method for Coulometric and Volumetric Determination of Moisture in Plastics - Important to identify moisture rate in plastics - important for bio-based and recycled plastics⁸¹</p>	

Stages in the Plastics Life Cycle	Government Legislation, Regulations, and Initiatives (A) Intergovernmental initiatives (B) Domestic ⁶⁰ legislation, regulations, ⁶¹ and initiatives (e.g. non-mandatory guidelines)	Voluntary Multistakeholder Standards	Non-Governmental Initiatives
<p>4. Plastic conversion - production of intermediate products (pellets, transport of pellets)⁸²</p>	<p><u>(B) DOMESTIC</u></p> <p>France - Decret relatif à la prévention des pertes de granules de plastiques industriels dans l'environnement – Decret N°2021-461 (2021) - The decree mandates: Implementation of measures for the prevention of plastic granules in the environment; Integration of an audit by 1 January 2023⁸³</p>	<p>ISO-ISO/DIS 5425 - Specifications for use of poly(lactic acid) based filament in additive manufacturing applications (Under development)⁸⁴</p> <p>BSI Group - PAS 510: 2021 - Plastic pellets, flakes and powders - Handling and management throughout the supply chain - “Sets out requirements for the handling and management of plastic pellets, flakes and powders throughout the supply chain to prevent spills, leaks and loss to the environment; covers all the elements from designating responsibilities to operational controls, performance evaluation and continual improvement”⁸⁵</p>	<p>Plastics Industry Association (US) and American Chemistry Council (US) - Operation Clean Sweep - Seeks to help the plastic industry “reduce the accidental loss of pellets, flakes and powder from the processing facility into the environment”; and, “globally”, the “abatement of pellet, flake and powder loss”⁸⁶</p> <p>ChemFORWARD and Sustainable Packaging Coalition - Plastic Additives Optimization Platform - Registry of safer plastic additives aiming to allow users to quickly identify chemicals of concern, and aiming to “avoid regrettable substitution, and “design with safer chemistry from the start”. Full dataset includes: 1100+ chemicals “organized by function and material compatibility”; 160+ “safer alternatives”; “Hazard band ratings for each chemical additive”; “Full hazard tables and endpoint rationales” for data beyond the hazard band rating; “Relevant regulatory and non-regulatory lists”⁸⁷</p>
<p>5. Product design⁸⁸</p> <ul style="list-style-type: none"> - Virgin plastic products - Recycled plastic products - Recyclability 	<p><u>(A) INTERGOVERNMENTAL</u></p> <p>OSPAR Commission (regional, intergovernmental) - Scoping Study on the Development of Best Practices for Design and Recycling of Fishing Gear – addressing plastic materials used in fishing gear. “Several options were identified for next steps in the scoping study to reduce the amount of fishing gear ending up as marine litter within the OSPAR Maritime Area (in terms of design and recycling of fishing gear)⁸⁹</p>	<p>ISO - 18602:2013 - Packaging and the environment - Optimization of the packaging system - Optimizing weight and volume of packaging; examples given in the standard include plastic packaging⁹³</p> <p>ISO-ISO/WD 4924 - Eco-design principle, requirement and guideline for express packaging (in development)⁹⁴</p>	<p>Association of Plastic Recyclers - The APR Design® Guide for Plastics Recyclability - The Guide aims to help package designers “measure each aspect of a package design against industry-accepted criteria to ensure that it is truly recycling compatible”. It “classifies package design features according to four recyclability categories: APR Design® Guide Preferred; Detrimental to Recycling; Renders Package Non-Recyclable; and Requires Testing.”⁹⁵ All features of package design must be accounted for to understand how a whole package will perform in the recycling system.</p>

<p>Stages in the Plastics Life Cycle</p>	<p>Government Legislation, Regulations, and Initiatives</p> <p>(A) Intergovernmental initiatives</p> <p>(B) Domestic⁶⁰ legislation, regulations,⁶¹ and initiatives (e.g. non-mandatory guidelines)</p>	<p>Voluntary Multistakeholder Standards</p>	<p>Non-Governmental Initiatives</p>
	<p>(B) DOMESTIC</p> <p>European Union - Directive 2019/904 (2019) - Directive on the reduction of the impact of certain plastic products on the environment - Design requirements - Article 6.1 - “Member States shall ensure that single-use plastic products listed in Part C of the Annex that have caps and lids made of plastic may be placed on the market only if the caps and lids remain attached to the containers during the products’ intended use stage”⁹⁰</p> <p>-Article 8.9 - “the Commission shall request the European standardisation organisations to develop harmonised standards relating to the circular design of fishing gear to encourage preparing for re-use and facilitate recyclability at end of life”</p> <p>India - Plastic Waste Management (Amendment) Rules, 2021 - Increase in the required thickness of plastic carry bags from 50 microns to 75 microns in effect from 30 September 2021 and 120 microns from 31 December 2022 in order to reduce waste and enable reuse⁹¹</p> <p>Japan - The Plastic Resource Circulation Act - Act N°60 of 2021 (“B”) - Addresses plastics life cycle: “Develop guidelines for Design for the Environment for manufacturers and establish a mechanism to certify products designed in accordance with the guideline.”; “The government procures preferentially the certified products (under the Act on Promoting Green Procurement) and provides financial support to the manufactures”⁹²</p>	<p>ISO - 18602:2013 - Packaging and the environment - Optimization of the packaging system - Optimizing weight and volume of packaging; examples given in the standard include plastic packaging⁹³</p> <p>ISO-ISO/WD 4924 - Eco-design principle, requirement and guideline for express packaging (in development)⁹⁴</p>	<p>Recyclclass - RecyClass Recyclability Certification - Evaluates and ranks the recyclability of plastic packaging, determining to which extent it is suitable for its dedicated sorting and recycling streams; requirements for the Recyclclass “Audit Scheme” “were developed in line with the RecyClass Recyclability Methodology and are continuously updated based on the RecyClass Design for Recycling Guidelines”⁹⁶</p> <p>CEFLEX - Design for a circular economy – recyclability of polyolefin-based flexible packaging - Guidelines aimed at facilitating the development of a circular economy for flexible packaging by 2025⁹⁷</p> <p>Consumer Goods Forum - Golden Design Rules - The Golden Design Rules foment packaging redesign, a series of voluntary guidelines for reduced plastic use and greater recyclability in packaging. The 9 Golden Design Rules are based on: “commonly adopted expert design guidelines”, “retailer design guidelines”, advice from “reputable bodies”, and the “work of Plastics Pacts as well as country-specific legislation”⁹⁸</p>

Stages in the Plastics Life Cycle	Government Legislation, Regulations, and Initiatives (A) Intergovernmental initiatives (B) Domestic ⁶⁰ legislation, regulations, ⁶¹ and initiatives (e.g. non-mandatory guidelines)	Voluntary Multistakeholder Standards	Non-Governmental Initiatives
<p>6. Manufacturing of plastic products⁹⁹</p> <ul style="list-style-type: none"> - PET - PS, LDPA - PVC <p>Manufacturing of plastics with hazardous additives</p>	<p>(A) INTERGOVERNMENTAL</p> <p>Strategic Approach to International Chemicals Management (SAICM) - Global best practices on emerging chemical policy issues including in relation to chemicals used in certain plastics products¹⁰⁰</p> <p>Stockholm Convention – Requirements for elimination or restriction of persistent organic pollutants (POPs) including substances that may be used in certain plastics production; annexes listing POPs are subject to amendment¹⁰¹</p> <p>(B) DOMESTIC</p> <p>Chinese Taipei – Restriction on the Production, Importation and Sale of Plate Packaging Materials, Regulated Recycle Containers and Non-plate Disposable Tableware Containers which Contain Polyvinyl Chloride (PVC) – (2022)¹⁰²</p> <p>Costa Rica – Ley para la prohibición del poliestireno expandido, reforma Ley para la Gestión Integral de Residuos – Law N°9703 (2019) - Law for the prohibition of expanded polystyrene, reform of the Law for Comprehensive Waste Management”) prohibits the importation, commercialization, and delivery of polystyrene containers in commercial settings, promotes more environmentally friendly alternatives¹⁰³</p> <p>The East African Community - Polythene Materials Control Bill, 2016 - Complete elimination of polythene bags in all the Partner States within one year of coming into force of the act. Exceptions to use, sale, manufacture or import to be specified in a separate schedule and updated as necessary or</p>	<p>ISO - 21257:2018(en) - Plastics - Polymer polyols for use in the production of polyurethane - Determination of the residual acrylonitrile and styrene monomer content by gas chromatography¹⁰⁷</p> <p>ISO - 20819-1:2020 - Plastics - Wood-plastic recycled composites (WPRC) - Part 1: Specification¹⁰⁸</p> <p>BSI Group – British Standard FLEX 6228 V2.0-Plastic packaging – Assessment of recycled content within polyethylene terephthalate (PET) virgin material and recycle blended packaging materials produced from mechanical recycling methods – Specification and test methods¹⁰⁹</p>	<p>Underwriters Laboratories (UL) - UL 2809 -Through an Environmental Claim Validation Procedure (ECVP) for Recycled Content, UL offers to evaluate the amount of recycled content in products¹¹⁰</p> <p>RAL Gütezeichen - RAL Gütegemeinschaft Wertstoffkette PET-Getränkeverpackungen e.V - For bottles producers and use of preforms with a higher recycle content; accounts for economic aspects and production efficiency; “quality and test specifications define the content and scope of the requirement profile for blow-moulding PET bottles and filling them”¹¹¹</p> <p>Sustainable Certifications Group - Sustainably Sourced Plastic (SSP) Certification - Certification for “recycled material purchasing, testing, and in-process quality controls” through “supply chain and procurement checks”¹¹²</p> <p>Scientific Certification Services (SCS) - Recycled Content Standard, V 7.0. - Standard developed by third party-standard-setting service SCS “applies to any material used in a product for which manufacturer is making a claim about the recycled content and type of material in the final product”¹¹³</p> <p>Plastic Pipe and Fittings Association (PPFA) - Sustainable Manufacturing Conformity Assessment Program for Plastic Piping Components (SMCAP) - For determining a facility’s compliance with the SMS 01-2012 standard, which “promotes: Water Conservation; Lowering Packaging Materials Waste; Improving Material Conversion Efficiency; Reducing Product Material Waste; Improving Material Conversion</p>

Stages in the Plastics Life Cycle	Government Legislation, Regulations, and Initiatives (A) Intergovernmental initiatives (B) Domestic ⁶⁰ legislation, regulations, ⁶¹ and initiatives (e.g. non-mandatory guidelines)	Voluntary Multistakeholder Standards	Non-Governmental Initiatives
	<p>permitted based on a written authorization from the relevant authority. Incentives for the use of biodegradable packaging materials where “biodegradable” is defined under the Act as meaning “a material or item that has the ability to break down or which can decompose back into the natural environment without causing harm”¹⁰⁴</p> <p>European Chemicals Agency - Plastic Additives Initiative) – industry guide¹⁰⁵ – including on uses of additives in plastic material</p> <p>European Union - Commission Regulation on plastic materials and articles intended to come into contact with food - Commission Regulations No 10/2011 (2011) - Requirements for plastic materials and articles intended to come into contact with food, in contact with food or which can reasonably be expected to come into contact with food. This includes a list of authorized substances, migration limits and requirements relating to compliance testing and declarations of compliance¹⁰⁶</p>		<p>Efficiency; Reducing Product Material Waste; Increasing Energy Efficiency; Increasing Plant Safety; Safe Product Use; Continued Participation in Life Cycle Analysis”, among other functions¹¹⁴</p>
<p>7. Plastic use and sales (including imports)¹¹⁵</p> <ul style="list-style-type: none"> - recyclability - compostability - domestic sales, imports, and distribution of plastics with hazardous additives 	<p>(A) INTERGOVERNMENTAL</p> <p>Food and Agriculture Organization - Voluntary Guidelines on the marking of fishing gear - Voluntary Guidelines on the Marking of Fishing Gear aim to “contribute to sustainable fisheries, to improve the state of the marine environment, and to enhance safety at sea by combatting, minimizing and eliminating abandoned, lost or otherwise discarded fishing gear (ALDFG) and facilitating the identification and recovery of such gear¹¹⁶</p>	<p>European Union - CEN/TC 466 – (Draft) - Standardization in the field of circularity and recyclability of plastic-based materials in fishing gear and aquaculture equipment. Excluded is standardization work concerning fish processing, fish packaging, fish food products and general work on materials and equipment covered by other CEN/TCS¹²⁴</p>	<p>Beat the Microbead- Zero Plastic Inside -‘Zero Plastic Inside’ logo for products without harmful microplastics ingredients; aim is to guarantee product are free of such ingredients¹²⁵</p> <p>Flustix - Content Free of Microplastic certification - An independent “‘trustmark’ for labelling plastic-free cosmetics, detergents, cleaning agents” and other products – certification provided for products, “especially liquid product contents, that are free of microplastics” - testing and certification is conducted on the basis of ECHA microplastic definition¹²⁶</p>

Stages in the Plastics Life Cycle	<p>Government Legislation, Regulations, and Initiatives</p> <p>(A) Intergovernmental initiatives</p> <p>(B) Domestic⁶⁰ legislation, regulations,⁶¹ and initiatives (e.g. non-mandatory guidelines)</p>	<p>Voluntary Multistakeholder Standards</p>	<p>Non-Governmental Initiatives</p>
	<p>European Union - Regulation on the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) - Regulation 1907/2006 (2006) - “REACH affects the entire packaging supply chain from suppliers of pulp and paper, plastics, metals, glass, coatings and printing inks, and adhesives, etc., to converters and packer-fillers. REACH entails responsibilities for: companies which use articles to make another article or are importers of articles; downstream users who use substances and/or preparations to make another preparation or an article; manufacturers and importers of substances as such and in preparations”¹¹⁹</p> <p>Fiji - Environmental Management (Budget Amendment) Act - Bill N°19 (2019) - Prohibits the manufacturing, selling, supplying and distributing plastic bags¹²⁰</p> <p>Kenya - Wildlife (Conservation and Management) Act - Chapter 376 - Section 116 (2020) - “Ban of use of plastic bottles, straws and related products within the protected areas in the national parks, national reserves, conservation areas and any other designated wildlife protected area”¹²¹</p> <p>Republic of Korea - Act on the Promotion of Saving and Recycling of Resources - (2018) - The amended Act “requires that materials and structures of packaging be graded and evaluated according to their recyclability. Once the grades are determined, they should also be marked on the labels of products, which is to promote the production of easily recyclable packaging”¹²²</p> <p>Seychelles - Environment Protection (Restriction on manufacturing, importation, distribution and sale of Plastic Bags) Regulations 2017 -S.I. No. 37 of 2017</p>		<p>Instituto per la Promozione delle Plastiche da Riciclo - Plastica Seconda Vita Food - “Certifies the recycled content and the traceability of materials and products intended for contact with food”. The “PSL Food” brand is issued for: “1) pre-consumer and/or post-consumer plastics and products made from these materials”, and “2) artefacts where the pre-consumer and/or post-consumer recycled plastic is used behind a functional barrier”¹²⁷</p> <p>International Safe Transit Association - The Responsible Packaging by Design (RPbD) Guide - A “step-by-step process management standard for the design, testing, and qualification of responsible packaging that meets industry, consumer, and regulatory expectations”¹²⁸</p> <p>Marine Stewardship Council (MSC) - The Fisheries Standard 3.0 - gear loss and ghost gear - Strengthening of requirements to “ensure the impacts of ghost gear are explicitly considered during every fishery assessment”; objective for fisheries to “have effective measures in place to minimize gear loss and mitigate the impact of any lost gear”¹²⁹</p> <p>VinylPlus - The VinylPlus Product Label - Sustainability certification scheme aiming to allow customers and markets to identify sustainable and high-performance PVC products for the building and construction sectors¹³⁰</p> <p>Walmart - Sustainable Packaging Playbook - Guidebook providing an “overview of sustainable packaging best practices for suppliers interested in improving and innovating packaging”¹³¹</p>

Stages in the Plastics Life Cycle	Government Legislation, Regulations, and Initiatives (A) Intergovernmental initiatives (B) Domestic ⁶⁰ legislation, regulations, ⁶¹ and initiatives (e.g. non-mandatory guidelines)	Voluntary Multistakeholder Standards	Non-Governmental Initiatives
	<p>These Regulations prohibit the manufacturing, importation, distribution and sale of plastic bags which do not fall into the category of exempted plastic bags as specified in the First Schedule. The Ministry responsible for Finance and Trade, subject to the approval of the Ministry of Environment, Energy and Climate Change may issue import permits for- (a) exempted plastic bags; or (b) biodegradable bags. Upon submitting an import permit application, the importer shall submit a certificate of conformity which shall stipulate the standard to which it is compliant to. Standards are set out in the Second Schedule¹²³</p>		
<p>8. Reuse and refill standards¹³²</p>	<p>(B) DOMESTIC</p> <p>Australia (New South Wales) - Waste Avoidance and Resource Recovery Amendment (Container Deposit Scheme) - Act N°57 (2016) - The act establishes “a container deposit scheme to promote litter reduction and the recovery, reuse and recycling of beverage containers; and for other purposes¹³³</p> <p>Germany - Packaging Act (VerpackG) (2019) - Provides for a deposit obligation that must be imposed on certain single-use beverage packaging¹³⁴</p> <p>Germany - Update Packaging Act (VerpackG) - (2022) - Extension of the mandatory deposit will to the beverages listed below, which were previously exempted. The Act imposes “[t]he condition [...] that they are filled in disposable plastic beverage bottles or in cans with a filling volume between 0.1 to 3.0 litres: Sparkling wine, mixed sparkling wine drinks; Wine and mixed wine drinks; Wine-like drinks and mixed drinks; Alcohol products and other mixed drinks containing alcohol; Fruit juices and vegetable juices; Non-carbonated fruit nectars and non-carbonated vegetable nectars”¹³⁶</p>	<p>ISO - 18603:2013 -Packaging and the environment — Reuse¹³⁸</p> <p>European Union - EN 13429:2004 - Specifies the requirements for a packaging to be classified as reusable and sets out procedures for assessment of conformity with those requirements including the associated systems¹³⁹</p>	<p>PR3 – Reusable Packaging System Design Standard for foodware (Draft) - Seeks to establish core requirements for aligning reuse systems between companies and brands, facilitate access to shared infrastructure; and “minimize reuse system costs and investor risks”; additional objectives include “maximizing accessibility, social equity, and environmental performance across the reuse supply chain”¹⁴⁰</p> <p>Deutsche Pfandsystem GmbH (DPG) - DPG deposit process - Establishment of a new one-way deposit system meant to facilitate the implementation of a “smooth deposit cycle”¹⁴¹</p>

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	<p>Malta - Environment Protection Act(CAP.549): Beverage Containers Recycling Regulations (2020) - The regulations further the objective of establishing a circular economy by creating a beverage container refund scheme. The regulations thereby promote national recycling efforts and reduce plastic waste.¹³⁷</p>		
<p>9. Collection and recovery of discarded plastic waste, sorting, and transportation of plastic waste</p>	<p>(B) DOMESTIC</p> <p>England and Wales - Environmental Permitting (England and Wales) (Amendment) Regulations (2014) - Section on Waste Sampling Requirements in England/Wales with the goal to provide robust and consistent data regarding the input and output materials from material facilities with the aim of improving the quality of recyclates nationally¹⁴²</p> <p>European Union - Directive on Packaging and Packaging Waste - Directive 94/62/EC/ (1994)¹⁴³ - “The Packaging Directive aims to: harmonise national measures on packaging and the management of packaging waste; provide a high level of environmental protection; ensure the good functioning of the internal market.</p> <p>The latest amendment to the Directive contains updated measures to: prevent the production of packaging waste, and promote the reuse, recycling and other forms of recovering of packaging waste, instead of its final disposal.”</p> <p>Specific targets for recycling under this scheme are: Current targets : 25%; In 2025 : 50%; In 2030 : 55%¹⁴⁴</p> <p>European Union - Regulation (EU) 2021/1139 (2021) - Regulation establishing the European Maritime, Fisheries and Aquaculture Fund (EMFAF)</p>	<p>ISO-ISO/DIS 24146-1(en) - Ships and marine technology - Marine environment protection - Part 1: Management and handling of shipboard waste on inland vessels - Specifies collection and sorting of waste on ships and the delivery of waste to port facilities¹⁴⁸</p> <p>BSI Group - BS PAS 103: Collected waste plastics packaging : Specification for quality and guidance for good practice in collection and preparation for recycling¹⁴⁹</p> <p>India - IS 16557: 2016 -Solid waste management - Segregation, collection and utilization at household/community level - Guidelines¹⁵⁰</p>	<p>RAL Gutezeichen - RAL-GZ T20 - % RECYCLED PLASTIC - Quality and test specifications for the verification of the proportion of plastics that have been obtained from fractions of household separate collection or household collection of recyclables in a plastic recycle, semi-finished product, product or packaging¹⁵¹</p> <p>Zero Plastic Oceans - Ocean Bound Plastic (OBP) Collection Organization Standard - “Standard is applicable to any Organization (for profit, not for profit, governmental or non-governmental) involved, or who wants to be involved in carrying out abandoned plastic collections and environmental cleanings for Recycling purposes, to certify the origin of the Plastic they collect as Ocean Bound Plastic”¹⁵²</p>

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	<p>- “Article 25. 1. The EMFAF may support actions that contribute to the protection and restoration of aquatic biodiversity and ecosystems, including in inland waters. 2. The support referred to in paragraph 1 may include, inter alia: (a) compensation to fishers for the passive collection of lost fishing gear and marine litter from the sea; (b) investments in ports or other infrastructure to provide adequate reception facilities for lost fishing gear and marine litter collected from the sea”¹⁴⁵</p> <p>Kenya - Environmental Management and Coordination Act (1999) - Establishes a framework for Kenya’s waste management that guides the licensing, transportation, and disposal of waste¹⁴⁶</p> <p>Nigeria - National Policy on Solid Waste Management (2018) - “6.1.1 Categories for sorting should include glass, paper, plastics for reuse and promote technology for recycling of waste components including plastics”¹⁴⁷</p>		
<p>10. Plastic waste treatment-waste disposal¹⁵³</p>	<p>(A) INTERGOVERNMENTAL</p> <p>Basel Convention -Plastic waste amendments aimed at enhancing control of transboundary movements: Annex VIII entry A3210 – identifies plastics wastes that are presumed hazardous (subject to Annex IX entry B3011 carve outs); Annex II – entry Y48 – identifies additional plastic wastes requiring “special consideration”¹⁵⁴</p> <p>Basel Convention -Practical guidance on the development of inventories of plastic waste¹⁵⁵</p> <p>COBSEA¹⁵⁶ - Regional Action Plan on Marine Litter – Objectives includes harmonization of standards and regulations within the region</p> <p>International Maritime Organization -Marine Environment Protection Committee Resolution – Action Plan to Address Marine Plastic Litter from Ships¹⁵⁷</p>	<p>ISO 37122:201 - Sustainable cities and communities - Indicators for smart cities-Contain indicators related to waste management¹⁶⁴</p> <p>ISO 16304:2018 -Ships and marine technology – Marine environment protection – Arrangement and management of port waste reception facilities¹⁶⁵</p> <p>ASTM D5231-92(2016) - Standard Test Method for Determination of the Composition of Unprocessed Municipal Solid Waste¹⁶⁶</p> <p>ASTM D6866 - Test Methods for Determining the Biobased Content of Solid, Liquid and Gaseous Samples Using Radiocarbon Analysis</p> <p>China - GB HJ 1207 - 2021 - Technical guide for self-monitoring of pollutant discharge units Rubber and plastic products¹⁶⁷</p>	<p>Eurofins - Zero Waste to Landfill Certificates - Eurofins provides three levels of Zero Waste to Landfill Certificates: “Zero Waste to Landfill Certificate: Demonstration of diversion over 99% of waste to landfill; Near Zero Waste to Landfill Certificate: demonstration of diversion 95% to 99% of waste to landfill; Advanced Waste Diversion Certificate: demonstration of diversion 85% to 95% of waste to landfill”¹⁷⁰</p> <p>The Plastic Industry Association (PLASTICS) - Zero Net Waste (ZNW) program - Recognizes companies that attempt to produce zero net waste when manufacturing: “Divert up to 90% of their total waste away from the landfill; Engage employees in environmental efforts; Avoid landfill costs and generate revenue by recycling”¹⁷¹</p>

Stages in the Plastics Life Cycle	Government Legislation, Regulations, and Initiatives (A) Intergovernmental initiatives (B) Domestic ⁶⁰ legislation, regulations, ⁶¹ and initiatives (e.g. non-mandatory guidelines)	Voluntary Multistakeholder Standards	Non-Governmental Initiatives
	<p>London Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter - Article IV and Annex I - requirement to prohibit dumping of certain wastes including persistent plastics¹⁵⁸</p> <p>MARPOL (intergovernmental) - Requirements including Annex V prohibition on disposal of plastic waste into the sea¹⁵⁹</p> <p>UNCLOS (intergovernmental) – Article 210 - Provisions related to pollution of the marine environment by dumping, including the requirement to “to prevent, reduce and control” such pollution¹⁶⁰</p> <p>UNEA - Resolutions on marine litter and microplastics¹⁶¹</p> <p>(B) DOMESTIC</p> <p>European Union - Eco-Management and Audit Scheme - The scheme covers the waste management sector</p> <p>Nigeria – National Environmental (Domestic and Industrial Plastic, Rubber and Foam Sector)- Regulations, S. I. No. 17 - Section 7(3) (2019) -“All recyclables, damaged and disused packaging materials (e.g. glass, plastics, metals, paper, wood, nylon, etc.) shall be recycled;”¹⁶²</p> <p>USA - Save our Seas Act 2.0 - S.1982 (2020) - “The SOS Act 2.0 is a vehicle through which the United States can implement more sustainable consumption and production solutions for plastic materials. It presents requirements for the U.S. Environmental Protection Agency (EPA) under three titles: (1) combating marine debris, (2) enhanced global engagement to combat marine debris, and (3) improving domestic infrastructure to prevent marine debris. EPA is responsible for addressing nine sections under these titles”¹⁶³</p>	<p>European Committee for Standardization (CEN) - European packaging standard EN 13432:2000 - “specifies requirements and procedures to determine the compostability and anaerobic treatability of all types of packaging and packaging materials, including paper. [...] In case of a packaging formed by different components, some of which are compostable and some other not, the packaging itself, as a whole is not compostable.”[Currently being revised to better reflect actual industrial composting practices and develop further the anaerobic part further]¹⁶⁸</p> <p>European Committee for Standardization (CEN) - European standard EN 17247:2022 -specifies requirements and test scheme for carrier bags suitable for treatment in well-managed home composting installations, including paper-based ones¹⁶⁹</p>	

<p>Stages in the Plastics Life Cycle</p>	<p>Government Legislation, Regulations, and Initiatives</p> <p>(A) Intergovernmental initiatives</p> <p>(B) Domestic⁶⁰ legislation, regulations,⁶¹ and initiatives (e.g. non-mandatory guidelines)</p>	<p>Voluntary Multistakeholder Standards</p>	<p>Non-Governmental Initiatives</p>
<p>11. Plastic waste treatment-waste disposal-Mechanical or chemical recycling</p>	<p>(B) DOMESTIC</p> <p>European Union - Waste Framework Directive - Directive 2008/98/EC - “The Waste Framework Directive sets the basic concepts and definitions related to waste management, including definitions of waste, recycling and recovery. [...] It explains when waste ceases to be waste and becomes a secondary raw material, and how to distinguish between waste and by-products. The Directive also introduces the ‘polluter pays principle’ and the ‘extended producer responsibility’¹⁷²</p>	<p>ISO 15270:2008 - Plastics - Guidelines for the recovery and recycling of plastics waste - Provides guidance for the development of standards and specifications covering plastics waste recovery, including recycling¹⁷³</p> <p>ISO-ISO/TR 23891:2020 - Plastics - Recycling and recovery - Necessity of standards -This document gives a brief overview of the current (2019) situation in plastic recycling systems, relevant existing standards and short description of different recycling techniques. It aims to identify the necessity of standards in the plastics recycling system and give direction for the adoption of regional standards and/ or the development of new and existing standards¹⁷⁴</p> <p>ISO-ISO 18604 - Materials & Recyclability - Introduced in 2012, this standard was intended to give guidance on which packaging can be classified as recoverable by material recycling and end the fragmented approach to recycling by jurisdictions, regulators, packaging manufacturers, or certification bodies to date^{175, 176}</p> <p>ISO-ISO/TR 17098:2013 - Packaging material recycling — Report on substances and materials which may impede recycling¹⁷⁷</p> <p>India –IS 14534 : 2016 - Plastics - Guidelines for the recovery and recycling of plastics waste (First Revision)¹⁷⁸</p> <p>China – HJ/t 364-2007 - Technical specifications Pollution control during collection and recycle of waste plastics¹⁷⁹</p> <p>ASTM - D5991-17- Standard Practice for Separation and Identification of Poly(Vinyl Chloride) (PVC) Contamination in Poly(Ethylene Terephthalate) (PET) Flake¹⁸⁰</p>	<p>European Certification of Plastics Recyclers (EUCERTPLAST) - Aims to facilitate recycler fulfilment of REACH requirements and food contact compliance, by increasing transparency of the European plastics industry; integrating various auditing schemes into a common one; establishing best recycling and trading practices¹⁸¹</p> <p>South Pole and Verra- Plastic Standard PWRM0002 - Plastic Waste Mechanical Recycling Methodology -Procedures are formulated to estimate the additional plastic waste that is recycled through: (1) “Recycling activities, including the installation of new recycling facilities; (2) Capacity additions to or technology improvement of existing recycling facilities, (3) Incentivizing or facilitating an increase in the collection of plastic waste¹⁸²</p>

Stages in the Plastics Life Cycle	Government Legislation, Regulations, and Initiatives (A) Intergovernmental initiatives (B) Domestic ⁶⁰ legislation, regulations, ⁶¹ and initiatives (e.g. non-mandatory guidelines)	Voluntary Multistakeholder Standards	Non-Governmental Initiatives
12. Plastic reprocessing ¹⁸³	<p>(B) DOMESTIC</p> <p>European Union – Regulation on Recycled Plastic Materials and Articles intended to come into contact with Foods – Regulation N°282/2008 (2008) - “Recycled plastic materials and articles within the scope of the Regulation may only be placed on the market if they contain recycled plastic obtained only from a recycling process, authorised in accordance with this Regulation”¹⁸⁴</p>	<p>United Kingdom – BS - EN 15348:2007 – Characterization of PET recyclates – Recyclate standards only apply to single polymer flakes¹⁸⁵</p> <p>Italy - UNI 10667-1:2017 - Plastic raw-secondary materials - Part 1: Generality on plastic raw secondary materials and plastics by-product¹⁸⁶</p>	<p>RAL Gütezeichen – RAL GZ 701: Wertstoff PET Getränkeverpackung - Quality and test regulations for recyclable PET beverage packaging that define the individual process stages - production of PET flakes, R-PET production, preform production and bottle blowing or filling - of the material cycle of PET beverage packaging¹⁸⁷</p>
13. Crosscutting standards that apply across the plastics value chain	<p>(A) INTERGOVERNMENTAL</p> <p>Food and Agriculture Organization (FAO)-The Assessment of Agricultural Plastics and their Sustainability 2021 includes a proposed international voluntary code of conduct providing guidance on the life cycles of plastic products used in agrifood value chains¹⁸⁸</p> <p>Food and Agricultural Organization (FAO) -Voluntary Code of Conduct on the sustainable use of plastics in agriculture taking into account the UNEA 5.2 Resolution (UNEP/EA.5/Res.14) - Draft Code of Conduct to presented for consideration at the 29th session of the FAO’s Committee on Agriculture (COAG) in 2024.¹⁸⁹</p> <p>(B) DOMESTIC</p> <p>Nigeria – National Policy on Plastic Waste Management (2020) -The policy aims to “promote sustainable use of plastic as a resource through its life cycle management”¹⁹⁰</p>	<p>India - ECO Mark Scheme - Governmental scheme for labelling of environment friendly products including plastic products. The Scheme is being administered by the Bureau of Indian Standards¹⁹¹</p>	<p>Control Union Certification- Plastic Free Certification - Certifies end products, packaging, and materials that do not contain fossil-fuel based plastics¹⁹²</p> <p>Responsible Plastic Management (RPM) – RPM certification - Audits and certifies the facts in declared Plastic Pacts to facilitate businesses in reducing the use of their plastics and ensure that they have appropriate systems in place¹⁹³</p> <p>Association for Supporting the SDGs for the United Nations - Guidelines for Reducing Plastics Waste and Global Partnership – company certification based on guidelines to reduce plastics and further climate change adaptation¹⁹⁴</p> <p>Solid Waste Environmental Excellence Performance - SWEEP+ Pilot Standard - “The Standard evaluates the environmental, economic, and social aspects of providing materials management services” for local government jurisdictions¹⁹⁵</p>

Stages in the Plastics Life Cycle	Government Legislation, Regulations, and Initiatives (A) Intergovernmental initiatives (B) Domestic ⁶⁰ legislation, regulations, ⁶¹ and initiatives (e.g. non-mandatory guidelines)	Voluntary Multistakeholder Standards	Non-Governmental Initiatives
<p>14. Standards on transparency and information disclosure across the value-chain</p>	<p>(B) DOMESTIC</p> <p>European Union – Directive concerning unfair business-to-consumer commercial practical in the internal market – Directive 2005/29/EC (2005) - Regulates the provision of information through environmental claims in the European Union¹⁹⁷</p> <p>United States - Federal Trade Commission Act : Unfair or Deceptive Acts or Practices – 15 U.S.C. § 45 (a) (2) - Regulates the provision of information through environmental claims in the United States. More details in the Green Guides of the Federal Trade Commission¹⁹⁸</p>	<p>ISO 14024 - Ecolabels - This document relates to Type I environmental labelling programmes, which award their environmental label to products that meet a set of predetermined requirements¹⁹⁹</p>	<p>International Sustainability and Carbon Certification (ISCC) - ISCC Plus - Physical Segregation - Initiative under which the delivery of physically segregated products will include 100% certified sustainable material, in the aim of facilitating claims that refer directly to physical characteristics²⁰⁰</p> <p>Global Reporting Initiative (GRI) - GRI 306:2020 : Waste - The standard addresses waste reporting. (not plastic specific)²⁰¹</p> <p>Global Reporting Initiative (GRI) - GRI 301: 2016 :Materials - Reporting requirements on materials (not plastic specific)²⁰²</p> <p>GS1 Global - GS1 Global Traceability Standard - GS1's framework for the design of interoperable traceability systems for supply chains²⁰³</p> <p>GS1 in Europe - GS 1 Circularity and Digital Product Passport - Mission-Specific Working Group²⁰⁴</p>

60. Including supranational initiatives.
61. Including technical regulations within the meaning of the WTO TBT Agreement.
62. For example the extraction, storage and transport of fossil fuels (oil and gas); growth and provision of bio- or plant-based feedstocks.
63. See European Commission (2022) and communication on the policy framework.
64. See ISO (n.d.-h).
65. See RoundTable on Sustainable Biomaterials (n.d.).
66. See REDcert (n.d.).
67. For example: refining components of crude oil or natural gas through a 'cracking process' to produce ethylene and propylene; refining of bio-based feedstocks; production of chemical additives used for plastics.
68. See synopsis at Government of Canada (n.d.).
69. See ASTM (n.d.).
70. See ANSI National Accreditation Board (n.d.).
71. For example, processing of plastics feedstocks via polymerisation into a diversity of resin plastics pellets and fibres (recycled and non-recycled pellets).
72. See Standardization Administration of the People's Republic of China (2017).
73. See European Parliament and Council (2010).
74. See ISO (n.d.-h).
75. See ISO (n.d.-h).
76. See ISO (n.d.-h).
77. See ASTM (n.d.).
78. See BSI (n.d.-b).
79. See ASTM (n.d.).
80. See ASTM (n.d.).
81. See ASTM (n.d.).
82. For example, conversion of polymers into a diversity of intermediate plastic products, including with different combinations of additives.
83. See République Française (2021).
84. See ISO (n.d.-i).
85. See BSI (n.d.-c).
86. See Operation Clean Sweep (n.d. & 2017).
87. See ChemFORWARD (n.d-a) and ChemFORWARD (n.d-b).
88. Design of plastic products or product parts and inputs.
89. See OSPAR Commission (2020).
90. European Parliament and Council (2019)
91. See Indian Ministry of Environment, Forest and Climate Change (2021).
92. See presentation at Japanese Ministry of the Environment (2022) and additional information at Japanese Ministry of Economy, Trade and Industry (2021).
93. See ISO (n.d.-h).
94. See ISO (n.d.-h).
95. See Association of Plastic Recyclers (n.d.).
96. See Recyclass (n.d.).
97. See CEFLEX (n.d.).
98. See The Consumer Goods Forum (2021).
99. Manufacture of a diversity of final plastic products, including those used as inputs into other products.
100. See SAICM (n.d.).
101. See Stockholm Convention on Persistent Organic Pollutants, May 22, 2001, 2256 U.N.T.S 119.
102. See Environmental Protection Administration (2022).
103. See Asamblea Legislativa de la Republica de Costa Rica (2019).
104. See EAC (2016).
105. See European Chemical Agency (2020).
106. See European Commission (2011).
107. See ISO (n.d.-h).
108. See ISO (n.d.-h).
109. See BSI (n.d.-b).
110. See UL Solutions (n.d.). RAL Gütezeichen (n.d.-a).
111. RAL Gütezeichen (n.d.-a).
112. See Sustainable Certifications Group (n.d.).
113. See SCS Global Services (2014 & n.d.).
114. See Plastic Pipe and Fittings Association (n.d.).
115. Use and sale (including imports) of plastic products and products with embedded plastic, products packaged in plastic, and plastic packaging by final consumers, brands, institutions, retailers, distributors, microplastics.
116. See FAO (2019, p. 11).
117. See Committee on Technical Barriers to Trade, Notification: China, WTO Doc. G/TBT/N/CHN/1502. (November 9, 2020).
118. See Environmental Protection Administration (2017).
119. See European Organization for Packaging and the Environment (2007).
120. See Republic of Fiji Parliament (2019).
121. See Kenya Law Reports (2012).
122. Committee on Technical Barriers to Trade, Notification: Republic of Korea, WTO Doc. G/TBT/N/KOR/857. (September 9, 2019).
123. See UNEP LEAP (n.d.).
124. See Centexbel (2021).
125. See Beat the Micro Bead (n.d.).
126. See Flustix (n.d.).
127. See Istituto Per La Promozione della Plastiche da Riciclo (n.d.).
128. See International Safe Transit Association (n.d.).
129. See MSC (n.d. & 2022).
130. See VinylPlus (n.d.).
131. See Walmart (n.d.).
132. Standards for reusable plastic products as well as dispensing machines and accessories intended for refill.

133. See New South Wales (2016).
134. See VerpackG (n.d.).
135. See Deutsche Pfandsystem GMBH (n.d.-b).
136. See Korea Ministry of Environment (2022) and Korea Legislation Research Institute (2019).
137. See Legizlazzjoni Malta (2020).
138. See ISO (n.d.-h).
139. See europen (n.d.-h).
140. See Resolve (n.d.-d).
141. See Deutsche Pfandsystem GMBH (n.d.-a).
142. See English Environmental Protection (2014).
143. See European Parliament and Council (2019).
144. See European Commission (n.d.-a).
145. See European Parliament and Council (2021).
146. See Kenya Law Report (1999).
147. See UNIDO (2021) and Federal Republic of Nigeria (2020).
148. See ISO (n.d.-i).
149. See Global Spec (n.d.).
150. See BIS (n.d.-b).
151. See RAL Gutezeichen (n.d.).
152. See Ocean Bound Plastic (2021 & n.d.).
153. For example, the treatment of sorted plastic wastes; landfill; incineration; dumping; recycling requirement.
154. See Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, Mar. 22, 1989, 1673 U.N.T.S. 126.
155. See Amendments to Annexes II, VIII and IX to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, Mar. 22, 1989, 1673 U.N.T.S. 126.
156. COBSEA stands for the Coordinating Body on the Seas of East Asia. The Action Plan applies to the countries participating in the East Asian Seas Action Plan: Cambodia, Indonesia, Malaysia, the People's Republic of China, the Philippines, the Republic of Korea, Singapore, Thailand and Vietnam. See COBSEA (2019).
157. See IMO (n.d.-a).
158. See Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, Oct. 29, 1972, 1046 U.N.T.S. 120.
159. See IMO (n.d.-b).
160. See United Nations Convention on the Law of the Sea, December 10, 1982, 1833 U.N.T.S. 397.
161. See UNEA (n.d.).
162. See LawNigeria (n.d.).
163. See One Planet Network (n.d.) and United States Congress (2022).
164. See ISO (n.d.-h).
165. See ISO (n.d.-h).
166. See ASTM (n.d.).
167. See GB Standards (n.d.).
168. See CEN (2000).
169. See CEN (2022).
170. See Eurofins (n.d.).
171. See PLASTICS (n.d.).
172. See European Commission (n.d.-b) and European Parliament and Council (2008).
173. See ISO (n.d.-h).
174. See ISO (n.d.-h).
175. See ISO (n.d.-h).
176. See Consumers International (2020).
177. See ISO (n.d.-h).
178. See BIS (n.d.-b).
179. See ChineseStandard.net (n.d.).
180. See ASTM (n.d.).
181. See EuCertPlast (n.d.).
182. See Verra (2022).
183. Reprocessing waste into a secondary material (e.g., recycled plastic) or product, or use in waste-to-fuel processes.
184. See European Commission (2008).
185. See BSI (n.d.-b).
186. See UNI (n.d.).
187. The award criteria have now been extended to the production of PET flakes, the cleaned and shredded material of used PET bottles, and adapted to the current state of the art. In addition, PET flakes manufacturers, the suppliers for granulate production, can now also receive the RAL quality mark (PETPpla.net, 2020).
188. See assessment of FAO (2021).
189. See FAO (2022).
190. See Federal Republic of Nigeria (2020).
191. See BIS (n.d.-a).
192. See Control Union (n.d.).
193. See Responsible Plastic Management (n.d.).
194. See UNDESA (n.d.).
195. See Solid Waste Environmental Excellence Performance (n.d.).
196. For example, procedural standards on disclosure of information and provision of information across the plastics value chain (chain of custody).
197. See European Parliament and Council (2005).
198. See Federal Trade Commission (1994).
199. See ISO (n.d.-h).
200. See International Sustainability Carbon Certification (n.d.).
201. See GRI (2020).
202. See GRI (2016).
203. See GS1 (2017).
204. See GS1 (n.d.).

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