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OCEAN WISE

Policies and Bans

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This report is a comprehensive study of the policies, incentives, and restrictions relating to the use, disposal and recycling of Expanded Polystyrene (EPS) and Extruded Polystyrene (XPS), primarily in OSPAR Contracting Parties, but also across Europe and globally. The research focus was on those EPS and XPS products which are most likely to become marine litter, i.e. single-use food and beverage containers.

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This report was prepared before the publication of the Commission guidelines on single-use plastic products in accordance with Directive (EU) 2019/904 of the European Parliament and of the Council on the reduction of the impact of certain plastic products on the environment, which can be reviewed at guidelines_single-use_plastics_products.pdf (europa.eu). The OceanWise WP 8 Final Report will address matters arising from this technical guidance.

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Glossary of Terms / Abbreviations

CDS	Container Deposit Scheme
EEA	European Environment Agency
EPR	Extended Producer Responsibility
EPS	Expanded Polystyrene
EU	European Union
EUMEPS	Association of European Manufacturers of Expanded Polystyrene
HDPE	High density polyethylene
HBCD / HBCDD	Hexabromocyclododecane
HELCOM	Baltic Marine Environment Protection Commission
LDPE	Low density polyethylene
MSFD	Marine Strategy Framework Directive
OSPAR	OSPAR Commission
PET	Polyethylene terephthalate
PS	Polystyrene
PVC	Polyvinyl chloride
SUP Directive	“Single Use Plastics” Directive
UNEP	United Nations Environment Programme
WFD	Waste Framework Directive
XPS	Extruded Polystyrene

1. POLICY LANDSCAPE

There are many policies and frameworks currently in place in Europe and beyond to reflect the growing awareness of the negative effects of plastic pollution on the planet, particularly in the marine environment. Often, these augment existing laws and policies aimed at moving global society away from the linear to the more circular consumption model. It is in this context that the OceanWise project is operating – multiple policies and frameworks either already in place or under development globally, with laws restricting or, in some cases, banning certain single-use plastic products.

1.1 European / EU initiatives

With the introduction of the first waste Directive in 1975[1] the European Union (EU) recognised the negative effect that poorly managed waste could have on the environment. In 1994 the first packaging waste Directive[2] was implemented. In the decades that have followed, the EU has introduced a number of Directives aimed at curbing the rise in packaging waste and improving the treatment of the packaging waste that is generated. There are now a number of policies which, either directly or indirectly, tackle one or more aspects of marine plastic pollution. The most pertinent ones to the OceanWise project are examined below.

1.1.1 The EU Action Plan for the Circular Economy

The EU Action Plan for the Circular Economy, which was adopted in 2015, and updated in 2020[3], is one of the building blocks of the EU Green Deal. It is described as a sustainable product policy framework which is intended to deliver products that are more circular in nature. In the section dealing with packaging, there is a focus on a range of actions that will be required to achieve a reduction in packaging waste and the establishment of rules for the safe recycling of plastics into food contact materials. This area in particular could directly affect plans to recycle waste EPS and XPS into new material which is suitable for food use.

1.1.2 The European Strategy for Plastics in a Circular Economy

The European Strategy for Plastics in a Circular Economy[4] was adopted in 2018. It includes objectives to improve both the quality and economics of plastics recycling, to boost demand for recycled plastics, and to reduce the amount of plastic waste entering the environment, particularly through the use of EPR Schemes at national level. An immediate output of the Strategy was the encouragement to stakeholders to voluntarily pledge to increase their demand for recycled plastics.

[1] Council Directive 75/442/EEC, available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31975L0442&from=EN

[2] European Parliament and Council directive 94/62/EC, available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:01994L0062-20130228&rid=1

[3] 'A New Circular Economy Action Plan, for a cleaner and more competitive Europe', published by the European Commission, 11 March 2020, available at: https://eur-lex.europa.eu/resource.html?uri=cellar:9903b325-6388-11ea-b735-01aa75ed71a1.0017.02/DOC_1&format=PDF Accessed November 2020.

[4] 'A European Strategy for Plastics in a Circular Economy', published by the European Commission 2018, available at: https://ec.europa.eu/environment/circular-economy/pdf/plastics-strategy-brochure.pdf Accessed November 2020.

To date, the Circular Plastic Alliance[5] has 277 signatories/pledges and these combined actions have the potential to deliver the targeted demand for recycled plastic of 10 million tonnes.

1.1.3 Marine Strategy Framework Directive

The Marine Strategy Framework Directive (MSFD) was adopted in 2008 (Directive 2008/56/EC[6]) and it establishes a framework within which EU Member States are required to take the necessary measures to achieve or maintain Good Environmental Status (GES) in the marine environment. The overarching aim of the Directive is to protect Europe's marine waters by applying an ecosystem-based approach to the management of human activities while enabling the sustainable use of the marine environment for present and future generations.

The MSFD is applied with reference to eleven qualitative descriptors which define overarching objectives in respect of key socioeconomic or ecological aspects of the marine environment. These specifically require the consideration of the following: biodiversity, non-indigenous species, commercial fish and shellfish, food webs, eutrophication, sea-floor integrity, hydrographical conditions, contaminants, contaminants in seafood, marine litter and energy including underwater noise.

The Directive is a multi-phase, multi cycle process with the initial cycle concluding in 2020. The second cycle of MSFD implementation has now commenced.

GES is defined as *'the environmental status of marine waters where these provide ecologically diverse and dynamic oceans and seas which are clean, healthy and productive within their intrinsic condition, and the use of the marine environment is at a level that is sustainable, thus safeguarding the potential for users and activities by current and future generations'.*

The first report[7] on its first full cycle of implementation was published in June 2020. The report notes that the assessment of marine litter was poorly understood prior to the implementation of the MSFD. It also notes that while the knowledge of the state of the marine area, within the jurisdiction of EU Member States, has improved enormously since the Directive's introduction, harmonising and integrating that knowledge at EU level has proved challenging.

The authors also note the actions taken by Member States under the MSFD assist the EU to meet many of the targets under the United Nations (UN) Sustainable Development Goal No. 14 'Life below water'. The MSFD is also helping to tackle the issue of lack of coordination of marine pollution monitoring methodologies at EU level.

The report notes the importance of the support provided by the MSFD for the introduction of the SUP Directive, through the provision of data by the MSFD Technical Group on Marine Litter, which led to the formulation of an impact assessment. It is intended that the MSFD will also help in

[5] Circular Plastics Alliance, website available at: https://ec.europa.eu/growth/industry/policy/circular-plastics-alliance_en
[6] Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of environmental policy (Marine Strategy Framework Directive), published by the European Union 25 June 2008, available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32008L0056&from=EN
[7] 'Report from the Commission to the European Parliament and the Council on the implementation of the Marine Strategy Directive (Directive 2008/56/EC), published 25 June 2020, available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0259&from=EN Accessed November 2020.

assessing the effectiveness of the SUP Directive by mapping litter and monitoring micro-plastic inputs and presence. It is also noted however that Member States have encountered difficulties in assessing the effectiveness of actions which they have undertaken. The reasons for this include the challenge in determining the timing of full implementation of any one measure, and gauging the effectiveness of one measure over the other, if a number of measures were introduced at the same time.

1.1.4 Packaging and Waste Packaging Directive

The first Packaging and Waste Packaging Directive[8] was implemented in 1994 and has been updated several times with the most recent amendment passed in 2018. Under the Directive and the subsequent amendments, which all Member States are obliged to have transposed, the main objectives are the prevention of packaging waste and the promotion of recycling and reuse. Measures to achieve these goals include:

- the introduction of instruments such as EPR schemes and deposit-return schemes (DRS);
- the introduction of systems to enable packaging to be re-used;
- the introduction of targets for the use of recycled material in packaging;
- the introduction of targets for recycling rates for the materials used in packaging.

Under Directive (EU) 2018/852[9] of the European Parliament and of the Council, amending Directive 94/62/EC on packaging and packaging waste, updated recycling targets for the EU as a whole were set out:

	Current targets	**By 2025**	**By 2030**
All packaging	55%	65%	70%
Plastic	25%	50%	55%
Wood	15%	25%	30%
Ferrous metals	50% (incl. Al)	70%	80%
Aluminium	-	50%	60%
Glass	60%	70%	75%
Paper and cardboard	60%	75%	85%

Figure 1. Recycling targets set out under Directive (EU) 2018/852[10]

[8] European Parliament and Council Directive 94/62/EC of 20 December 1994 on packaging and packaging waste, published 31 December 1994, available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:01994L0062-20150526&from=EN

[9] Directive (EU) of the European Parliament and of the Council of 30 May 2018 amending Directive 94/62/EC on packaging and packaging waste, published by the EU 14 June 2018, available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018L0852&from=EN

[10] Ibid.

1.1.5 Directive on the reduction of the impact of certain plastic products

While many other countries had already instituted a ban or restrictions on the sale and/or supply of many single-use packaging products, including some made from EPS and XPS, the EU did not introduce a Directive aimed at reducing the amount of plastic waste generated until 2019. The Directive 2019/904[11] "…on the reduction of the impact of certain plastic products on the environment," commonly referred to as the Single Use Plastics (SUP) Directive, dovetails with a number of EU initiatives and existing Directives. However, it is important to note that the Directive also covers other plastic items such as fishing gear and aquaculture products which are not single use in nature.

It is also worth noting the SUP Directive states "that Member States were already required to ensure environmentally sound waste management to prevent and reduce marine litter from both sea and land sources" under the Waste Directive 2008/98/EC[12] and the Port Reception Facilities Directive 2000/59/EC[13].

Single Use is defined in Article 3 as a product which is not designed for multiple uses. Article 12 then goes on to stipulate that:

> "In order to determine whether a food container is to be considered as a single-use plastic product for the purposes of this Directive, in addition to the criteria listed in the Annex as regards food containers, its tendency to become litter, due to its volume or size, in particular single-serve portions, shall play a decisive role".

This makes it clear that the containers used to deliver food from takeaways, delicatessens and "fish and chip" shops, are covered by the Directive.

The Directive "promotes circular approaches that give priority to sustainable and non-toxic re-usable products and re-use systems rather than to single-use products". This sentence is particularly important as it infers that simply replacing the products which are to be restricted from import, sale and use once the Directive becomes effective (due to be transposed by all Member States by July 2021) with those made from other materials is not the preferred outcome. Rather a shift to different and more sustainable systems of delivery (particularly in the case of food) is envisaged. Again the Directive goes on to state that Member States should encourage the use of products that are suitable for multiple use and that are, after having become waste, "suitable for preparing for re-use and recycling". The Directive also states that the Commission (note not Member States) "should take into account the relative properties of different packaging materials, including composite materials, on the basis of life-cycle assessments, addressing in particular waste prevention and design for circularity" though again this is a little vague.

[11] Directive (EU) 2019/904 of the European Parliament and of the Council of 5 June 2019 on the reduction of the impact of certain plastic products on the environment, published by the EU 12 June 2019, available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019L0904&from=EN

[12] Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives, published by the EU 22 November 2008, available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32008L0098&from=EN

[13] Directive 2000/59/EC of the European Parliament and of the Council of 27 November 2000 on port reception facilities for ship-generated waste and cargo residues, published by the EC November 2008 (no longer in force since 26/06/2019), available at: https://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX%3A32000L0059

While it is against the spirit of the Directive, products made from alternative materials may be introduced, if it is cheaper and/or quicker to introduce different suppliers than implement a different delivery system, such as introducing reusable items. This substitution could be short-lived however as any such items would be subject to the EPR scheme which must be in place in each Member State by the end of 2024 according to the SUP Directive. While the Directive is designed to have far reaching consequences there is a risk that litter amounts will not reduce as desired due to the impact of marine litter originating from outside the EU and as, in many cases, SUP items will just be replaced with items made other materials which dissipate quicker in the marine environment. These may be slightly less damaging but will become litter nonetheless. It is noteworthy that the Commission included a section on the importance of monitoring levels of marine litter in order to assess the effectiveness of the Directive, but it does not reference the difficulties posed by trying to determine the origin of much marine litter, particularly plastics including EPS and XPS fragments.

While it would be difficult to argue with the statement that "proper waste management remains essential for the prevention of all litter, including marine litter", it is not the only driver of end-of-life products, whether they are single or multiple-use, becoming marine litter. Human behaviour such as littering, fly tipping, illegal dumping at sea or careless management of materials or products leading to their loss into the environment is as much a cause as poor waste management practices.

The Directive is very specific in its description of single-use plastic containers including "fast-food, meal, sandwich wrap and salad boxes with hot or cold food, or food containers of fresh or processed food that does not need further preparation, such as fruits, vegetables and desserts." (See Appendix N).

Single use plastic products "should be addressed by one or several measures, depending on various factors, such as the availability of suitable and more sustainable alternatives, the feasibility of changing consumption patterns…" the second of which is a little vague.

In Part A of the Directive's Annex, the detail is provided for Article 4 which covers the reduction in consumption of a number of single-use plastic items as follows:

"(1) Cups for beverages, including their covers and lids;

(2) Food containers, i.e. receptacles such as boxes, with or without a cover, used to contain food which:

a) Is intended for immediate consumption, either on-the-spot or take-away
b) Is typically consumed from the receptacle, and
c) Is ready to be consumed without any further preparation, such as cooking, boiling or heating,

including food containers used for fast food or other meal ready for immediate consumption, except beverage containers, plates and packets and wrappers containing food".

This first section, while it does not explicitly reference XPS, includes all of the types of containers which are often supplied with XPS as the material. Member States are expected to introduce targets for consumption reduction and ensure that re-usable alternatives are made available at point-of-

sale. They may also use economic instruments, such as a fee or tax, to prevent such items being distributed free of charge. These are viewed as a vital range of measures to achieve the reduction in the volume of these items being used in the first place.

In Part B of the Annex, the detail is provided for Article 5 which covers restrictions on placing on the market as follows:

"(7) Food containers made of expanded polystyrene, i.e. receptacles such as boxes, with or without a cover, used to contain food which:

d) Is intended for immediate consumption, either on-the-spot or take-away
e) Is typically consumed from the receptacle, and
f) Is ready to be consumed without any further preparation, such as cooking, boiling or heating,

including food containers used for fast food or other meal ready for immediate consumption, except beverage containers, plates and packets and wrappers containing food;

(8) Beverage containers made of expanded polystyrene, including their caps and lids;

(9) Cups for beverages made of expanded polystyrene, including their covers and lids."

This section is very comprehensive and is clearly designed to cover the wide range of uses which EPS containers are used for. Many of these uses are likely to be of products made from XPS rather than EPS, such as clamshell containers, but XPS is not referenced (See Appendix One).

In what could be seen as somewhat unusual, a material is specifically referenced and for two reasons:

> "…in view of the high prevalence of expanded polystyrene litter in the marine environment and the availability of alternatives, single-use food and beverage containers and cups for beverages made of expanded polystyrene should also be restricted".

This sentence, from paragraph 15, references EPS only and not XPS and indicates that other materials are available.
The sale, distribution and use of single-use plastic products made from XPS will be affected by Article 8 which obliges Member States to establish extended producer responsibility (EPR) schemes for all referenced single-use plastic products. Part E describes the items covered by this article:

"Food containers i.e. receptacles such as boxes, with or without a cover, used to contain food which:

a) Is intended for immediate consumption, either on-the-spot or take-away
b) Is typically consumed from the receptacle, and
c) Is ready to be consumed without any further preparation, such as cooking, boiling or heating,

including food containers used for fast food or other meal ready for immediate consumption, except beverage containers, plates and packets and wrappers containing food;"

So while XPS plastic products are not explicitly covered under the restriction for sale, the manufacturers and suppliers will have to participate in an EPR scheme for these products at end-of-life. Given the varied use of such products, particularly at the consumer end, the coordination of such a scheme is likely to take some considerable time (under the Directive, the date for the establishment of the EPR Scheme is the end of 2024). Manufacturers will also have to deal with measures introduced, which will probably erode their sales volume at the front end; these pressures may drive a consideration as to how the financial sustainability of these items can be maintained.

What is not clear from the Directive is how the restrictions on the sale of certain products, i.e. EPS food service containers, will directly lead to a reduction in marine litter. A number of factors combine to generate marine litter, including poor consumer behaviour, a lack of proper waste management infrastructure, a dearth of recycling facilities and weak demand for recyclates. Behavioural change is required on the part of the consumer, ensuring that they dispose of used containers correctly, or stop using them in the first place, but it is only one of several changes that need to be undertaken to stem the flow of all types of litter into the sea.

1.1.5.1 Reaction to the SUP Directive

When the draft SUP Directive was published in October 2018, there was some push-back from various stakeholders about the late inclusion of EPS in the text.

Styrenics Circular Solutions (SCS), an industry partnership of several industry stakeholders, issued a statement[14] in November 2018. The group pointed to the fact that the SUP proposal was supposed to ban/restrict product types, not specific materials, and on that basis, neither an impact assessment nor an analysis of materials which could be used as alternatives to EPS was completed. As a result, SCS felt that there was a risk of EPS products being substituted with materials which were no more sustainable than EPS and which would do nothing to address the root causes of marine litter.

Other industry groups, while being broadly in support of the aims of the Directive, voiced[15] their concerns in 2019 about:

- the poor definition of certain products (Europen – the European packaging organisation);
- the lack of an impact assessment and life-cycle analysis of products made from other materials (EuPC - Association of European Plastics Converters);
- the overlooking of related factors causing marine plastic litter (IK – the German association for packaging);
- the lack of specific definitions and categories (Plastics*Europe*).

[14] Statement against bans of EPS in the single-use plastic proposal, published by Styrenics Circular Solutions, November 2018, available at: http://styrenics-circular-solutions.com/wp-content/uploads/2018/11/20181122-SCS-Statement-opposing-EPS-SUP-ban-.pdf Accessed November 2020.

[15] 'Adoption of the Single-Use Plastics Directive: Industry organisations react', by Elisabeth Skoda, published by Packaging Europe, 29 March 2019, available at: https://packagingeurope.com/adoption-of-the-single-use-plastics-directive-industry/ Accessed November 2020.

In March 2019, the UK-based Food Service Packaging Association argued[16] that the inclusion of EPS specifically was both unfair and unwarranted, given "….food service EPS was ranked 28 in the list of most frequently found items of marine litter….".

It is also interesting to note that the study[17] by Arcadis which was conducted in 2014 to establish a quantitative marine litter reduction target only ever referred to EPS in terms of EPS fish-boxes. It includes them in a list of plastic packaging items, which were specifically covered by various EU Directives. There is no reference at all to other EPS products or to XPS.

The negative feedback did not stop the draft text being finalised as proposed and the Directive became legislation on 03 July 2019.

From the time of the publication of the Directive, concerns have been raised about some of the definitions contained therein.

EuPC has raised the issue of the definitions in the Directive on more than one occasion. While the Directive was still at proposal stage, EuPC issued a press release[18] describing the text "…as a symbolic attack on a poorly defined products….". Later in 2018, another press statement was released[19], again highlighting the association's dissatisfaction with the Directive, referring to it as a "superficial legal text" and noting the poor risk assessment of the possible environmental outcomes (from substitute materials).

The European Paper Packaging Alliance lobby group has taken issue[20] with the proposed guidance that has so far emerged about the SUP Directive, stating that the rules are not sufficiently clear to distinguish paper cups with a polymer coating from plastic cups.

A comprehensive, technical sustainability assessment[21] of the SUP Directive found four fundamental flaws with the evidence used on which the bans and restrictions, as envisaged by the text of the Directive, are based:

1) There is a lack of conformity (e.g. ISO certification) with the Life-Cycle Analysis used;

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[16] 'FPA wants EU rethink on EPS ban', published by Packaging News, 08 March 2019, available at: https://www.packagingnews.co.uk/news/fpa-wants-eu-rethink-eps-ban-08-03-2019 Accessed November 2020.

[17] 'Marine litter study to support the establishment of an initial quantitative headline reduction target – Final Report', by Van Acoleyen, M. et al, published by Arcadis and EUCC, available at: https://www.researchgate.net/profile/Joana_Mira_Veiga/publication/266684908_Study_to_support_the_establishment_of_an_initial_quantitative_headline_reduction_target_for_marine_litter_-_final_report_to_the_European_Commission/links/5437abf50cf2590375c53ac2/Study-to-support-the-establishment-of-an-initial-quantitative-headline-reduction-target-for-marine-litter-final-report-to-the-European-Commission.pdf Accessed November 2020.

[18] EuPC's first comments on the European Commission's directive proposal on the reduction of certain single-use plastics, published by EuPC 18 May 2018, details available at: https://www.plasticsconverters.eu/post/2018/05/30/eupcs-first-comments-on-the-european-commissions-directive-proposal-on-the-reduction-of-c Accessed October 2020.

[19] 'Single-Use Plastics: Let's talk about the environment', published by EuPC, 21 December 2018, details available at: https://www.plasticsconverters.eu/post/2018/12/21/press-release-single-use-plastics-let-s-talk-about-the-environment Accessed November 2020.

[20] 'Single Use Plastics Directive guidance poses a challenge for circularity1', published by the European Paper Packaging Alliance, 11 September 2020, details available at: https://eppa-eu.org/general/press-release-european-paper-packaging-alliance-9-september-2020.html Accessed December 2020.

[21] 'Sustainability Assessment of a Single-Use Plastics Ban', by Herberz, T. et al., published by MDPI, 05 May 2020, available at: https://www.mdpi.com/2071-1050/12/9/3746 Accessed October 2020.

2) The LCA does not include an End-of-Life stage, which by its omission favours biodegradable products (many of these are land-filled and therefore contribute to landfill emissions);
3) The LCA considers air pollutants only;
4) The results of the LCA assessment are poorly discussed and communicated.

The authors concluded that the implementation of the Directive could have both negative and positive impacts on the marine environment, and that the reduction in marine plastic litter is likely to be quite small (0.06% at a global level). They recommend that the EU should use ISO or similar standards for the LCA and also focus on littering and mismanagement of plastic waste.

A briefing document[22] published by Zero Waste Europe, on the SUP Directive, did not remark on the exclusion of XPS products in Part E of the Directive, which prohibits the placing of certain items on the market. It noted the importance of eco-modulation for fees in EPR schemes and recommended that producers cover 100% of the clean-up costs.

A position paper[23] published by reloop (resources remain resources) on the implementation of the SUP Directive honed in on several aspects of the legislation. In its overview, the concern was noted that the consultation process was too focused on definitions and not the links between the Directive's objectives and the expected outcomes. The paper argues that the definitions used in Part B should be as broad as possible and Member States should consider measures which reduce the use of all single-use plastic items, regardless of their composition.

It was reported[24] in July 2020 that delays in transposing the Directive were being encountered in many Member States, with the onset of the Covid-19 pandemic leading to an increase in the use of single-use plastic products and consequently a rise in the volumes of litter found.

1.1.5.2 Guidance on SUP Directive

The Commission is obliged under Article 12 of the Directive to: "…publish guidelines, in consultation with Members States, including examples of what is to be considered a single-use plastic product for the purposes of this Directive as appropriate". These guidelines were due by 03 July 2020 i.e. a year after the Directive was adopted and a full year prior to the deadline for transposition of the Directive by Member States.

At the time of writing the guidelines are yet to be published and are now due overdue. They should focus[25], according to the Belgian Packaging Institute (IBE-BVI), on the definition of single-use plastic products "including product-specific criteria and examples". Manufacturers, suppliers and retail users of single-use plastic products which may fall within the scope of the Directive are, no doubt, also hoping that the guidance will give clear examples. It is also been indicated that the Commission

[22] 'Unfolding the Single-Use Plastics Directive; Policy Briefing, published by Zero Waste Europe, May 2019, available at: https://rethinkplasticalliance.eu/wp-content/uploads/2019/05/ZWE_Unfolding-the-SUP-directive.pdf Accessed October 2020.
[23] Position Paper: Implementation of the Single Use Plastics Directive (EU) 219/904, published by reloop, 04 October 2019, available at: https://www.reloopplatform.org/wp-content/uploads/2020/01/SUPD_position_definitions-Oct-2019.pdf
[24] 'Member States stalling on implementation of European plastic law while plastic littering surges', published by Seas at Risk, 01 July 2020, details available at: https://seas-at-risk.org/stalling-european-plastic-law.html Accessed October 2020.
[25] 'SUP: guidance on plastic products for single use', published by IBE-BVI, 16 October 2020, available at: https://ibebvi.be/en/news/detail/sup-guidance-on-plastic-products-for-single-use Accessed November 2020.

will clarify the position regarding the exclusion of XPS products from the Directive text, in the guidelines.

A further set of Draft Guidelines was made available in January 2021 to which a number of plastics and other industry associations, including the Association of European Manufacturers of Expanded Polystyrene (EUMEPS), responded with a joint statement[26]. They iterated their support for the SUP's objectives but noted the following concerns:

- The most recent Guidelines fail to address the lack of clarity of some of the core provisions of the Directive in the legal text, which may hamper the adoption of a harmonised approach by Member States when transposing the legislation;
- The Guidelines indicate that there is a disconnect between them and the original focus of the Directive and as a result, the Guidelines now encroach on the scope of the Packaging and Packaging Waste Directive.

The guidelines[27] are being prepared by a team of experts led by Ramboll, a consultancy firm based in Germany. It has been indicated by the EU that there will be no further consultation in relation to the guidelines and the final document is expected to be published in May 2021.

1.2 OSPAR Regional Sea Convention

The 1992 OSPAR Convention for the Protection of the Marine Environment of the North-East Atlantic unified and updated the 1972 Oslo and 1974 Paris Conventions. It brings together the governments of Belgium, Denmark, Finland, France, Germany, Iceland, Ireland, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom, together with the European Community. More than 60 international non-governmental organisations are involved in OSPAR as official Observers. They represent a broad range of interests and expertise related to the marine environment and the uses of marine resources. It is one of four European Regional Sea Conventions the others being: the Barcelona Convention, which covers the Mediterranean; the Bucharest Convention, covering the Black sea and the Helsinki Convention, or HELCOM, which covers the Baltic.

The Marine Strategy Framework Directive requires a regional approach for its implementation. Article 6 of the Directive requires that "Member States shall, where practical and appropriate, use existing regional institutional cooperation structures, including those under Regional Sea Conventions…" and that these should be used as a mechanism "…to coordinate their actions with third countries having sovereignty or jurisdiction over waters in the same marine region or subregion".

Thus, Europe's Regional Sea Conventions, such as OSPAR are intrinsically linked with the implementation of MSFD. The main work areas covered by the Convention are:

[26] 'Industry issues a joint statement in the Single-Use Plastics (SUP) Directive', published by the International Association for Soaps, Detergents and Maintenance Products, 25 January 2021, available at: https://www.aise.eu/newsroom/aise-news/industry-issues-a-joint-statement-on-the-single-use-plastics-sup-draft-guidelines.aspx

[27] 'Reducing the environmental impact of certain plastic products in the EU', published by Ramboll, details available at: https://ramboll.com/projects/germany/reducing-impact-of-plastic-products-eu Accessed several times 2020,2021

- Hazardous substances and Eutrophication
- Offshore Industry
- Radioactive Substances
- Biodiversity and Ecosystems
- Environmental Impacts of Human Activity
- Cross cutting issues

Marine litter is dealt with under the Environmental Impacts of Human Activity (EIHA) committee's work. EIHA's work is supported by the Intersessional Correspondence Group on Marine Litter, or ICG-ML.

OSPAR's Marine Litter Regional Action Plan[28] (RAP) was launched in 2014 which aligns with many of the objectives of the MFSD, the United Nations Environment Programme (UNEP) and the UN's Global Partnership on Marine Litter. The RAP focusses on the development of regionally coordinated actions to reduce the impacts from marine litter, monitoring and assessment and strengthening cooperation with other relevant regional and international organisations and industry. In the RAP, it was estimated that plastics made up in the region of 90% of litter found on the shorelines of the OSPAR partner countries. Of the 31 Actions detailed in the Plan, Action No. 49 was "Investigate the prevalence and impact of polystyrene (EPS) in the marine environment, and engage with industry to make proposal for alternative materials and/or how to reduce its impact". This action, led by Portugal, with support from Ireland, was the driver for the development of the OceanWise project.

1.3 Other initiatives

Policy initiatives are underway outside of Europe to tackle single-use plastic production and marine plastic litter.

1.3.1 International Union for the Conservation of Nature

The International Union for the Conservation of Nature (IUCN) carried out a review[29] of national marine plastic litter policies in EU Member States which was published in November 2017. The country reviews are detailed under the individual country profiles.

1.3.2 G20 Action Plan on Marine Litter

As members of the EU, all Member States are effectively represented at the G20[30] which has 19 country members plus the EU. When the G20 met in 2017, the G20 Action Plan on Marine Litter was launched. In 2019 when the G20 met again its members established the G20 Implementation

[28] Regional Action Plan for Marine Litter, OSPAR, available at: https://www.ospar.org/work-areas/eiha/marine-litter/regional-action-plan

[29] 'National marine plastic litter policies in EU member states: an overview', published by the International Union for the Conservation of Nature November 2017, available at: https://portals.iucn.org/library/sites/library/files/documents/2017-052.pdf Accessed November 2020.

[30] G20, website available at: https://g20.org/en/about/Pages/Participants.aspx

Framework for Actions on Marine Litter and later agreed the "Osaka Blue Ocean Vision[31]". This vision aims to "reduce additional pollution by marine plastic litter to zero by 2050…."

An online 'Towards Osaka Blue Ocean Vision' meeting was held in September 2020, hosted by Japan, at which the importance of monitoring data at a global level and data sharing were discussed. An update[32] was subsequently provided by each G20 member, a summary of which is provided under the relevant country section.

1.3.3 Association of Southeast Asian Nations (ASEAN)

The members of the ASEAN signed a declaration[33] in 2019 which affirmed their determination to take concrete actions in combatting marine plastic debris, recognised the importance of multi-stakeholder and ASEAN member state co-operation and encouraged taking an integrated land-to-sea approach to prevent and reduce marine debris.

1.4 Plastic production in Europe

The Plastics*Europe* report, Plastics – the Facts 2020[34], has the most up-to-date figures, reporting that the total turnover of the European plastics industry was more than €350bn in 2019, employing 1.5 million people in 55,000 companies. Interestingly, while global production of plastics increased, the then EU28 (pre-Brexit), together with Norway and Switzerland, saw its production volumes fall somewhat, to 57.9 million tonnes.

Despite many companies pledging to reduce their packaging, and the introduction of laws to regulate the use of single-use plastics in the EU and further afield, packaging still accounted for nearly 40% of demand in 2019. In terms of resin demand, PS (which for the purposes of the Plastics*Europe* report includes XPS) was slightly lower than in 2018, at approximately 1.6 million tonnes. The figure for EPS demand was about the same amount, 1.6 million tonnes, and reflected no change on the previous year.

[31] 'Towards Osaka Blue Ocean Vision, G20 Implementation Framework for Actions on Marine Plastic Litter', website available at: https://g20mpl.org/about

[32] G20 participants, details available at: https://g20.org/en/about/Pages/Participants.aspx

[33] Bangkok Declaration on Combatting Marine Plastic Debris in ASEAN Region, signed 22 June 2019, available at: https://asean.org/storage/2019/06/2.-Bangkok-Declaration-on-Combating-Marine-Debris-in-ASEAN-Region-FINAL.pdf

[34] Plastics – the Facts 2020, published by Plastics*Europe,* available at: https://www.plasticseurope.org/en/resources/publications/4312-plastics-facts-2020

Figure 2. Resin demand details from Plastics*Europe* - the Facts 2020 Report[35]

The report states that an estimated 17.8 million tonnes of plastics post-consumer waste was collected for treatment with 42% of it being recycled, with a steep drop in the volume being exported out of the EU. About 4 million tonnes of plastic recyclate was used in the production of new items in Europe, which equates to just 6.9% of overall plastics production.

1.5 Plastic production globally

The Plastics*Europe* report, Plastics – the Facts 2020[36], estimates that global plastic production increased in 2019, to 368 million tonnes. The breakdown of production (per the report) is as follows:

- Asia 51%, 187.7 million tonnes
- NAFTA (Canada, Mexico, United States) 19%, 69.9 million tonnes
- Europe 16%, 58 million tonnes
- Middle East & Africa 7%, 25.7 million tonnes
- Latin America 4%, 14.7 million tonnes
- CIS (Commonwealth of Independent States) 3%, 11 million tonnes

[35] Ibid.
[36] *Plastics – the Facts 2020,* published by Plastics*Europe,* available at: https://www.plasticseurope.org/en/resources/publications/4312-plastics-facts-2020

1.6 Plastic production under review

The production of plastic is now being considered by bodies such as the Principles for Responsible Investment, reflecting that Environmental, Social and Governance (ESG) factors are becoming increasingly important to investors. This is being driven by both consumers of products like ethical pension investments and activist shareholders, often large organisations themselves, who invest in publicly-quoted companies. In the same way that many institutions and pensions funds are reviewing their investment in fossil-fuel industries such as petroleum, some are now thinking ahead to what could become problematic in the future, in terms of shareholder views. Plastics are derived from fossil fuels so some shareholders may demand that future investment does not go into plastic production.

In 2019, Principles for Responsible Investment (PRI), an initiative in partnership with the UNEP Finance Initiative and the UN Global Compact published an overview[37] of plastic regulations and policies.

In its introduction the report maps the introduction of laws that are aimed at tackling single-use and other types of plastics, which have been introduced in many parts of the world. Their graph specifically refers to "plastic bags, Styrofoam and other utensils…." However, neither EPS nor XPS is referenced anywhere in the report.

Figure 2: Estimated number of new regulations on single-use plastic coming into force at a national level (globally). Source: Anthesis (adapted from UN Environment, Single-Use Plastics A Roadmap for Sustainability)

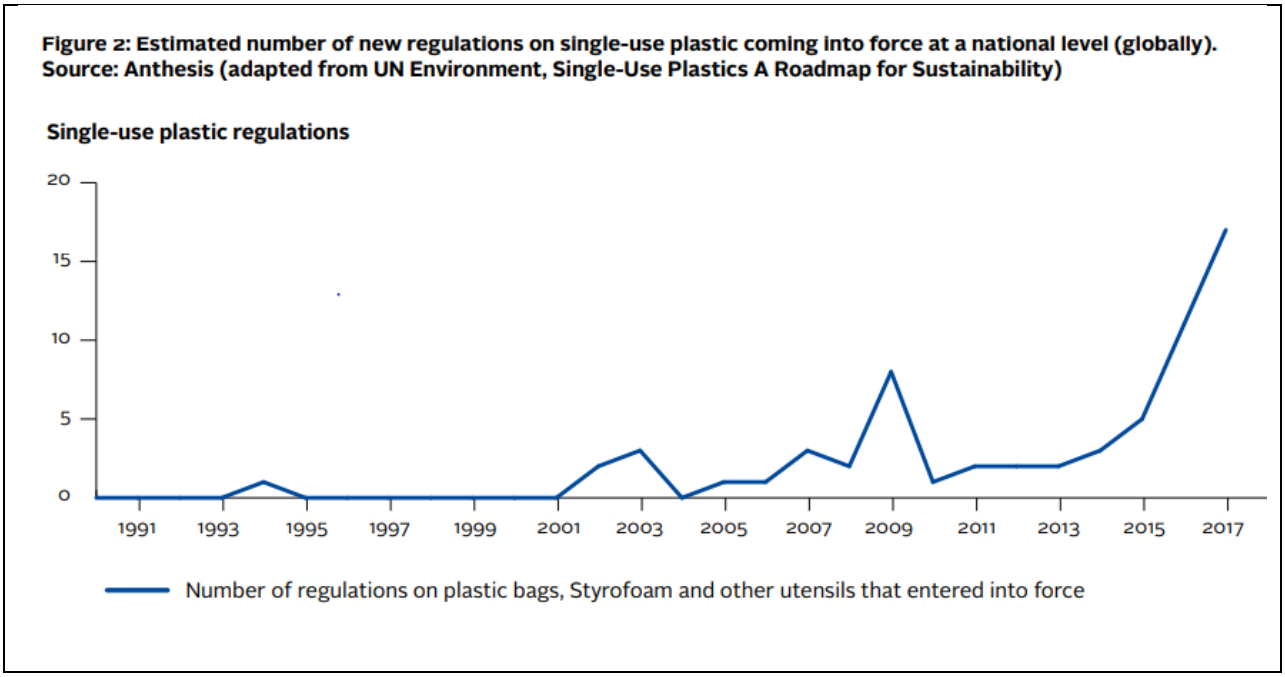

Figure 3. Extract from PRI Plastics Report, 2019[38]

In the PRI's report[39] on the risks and opportunities along the plastics value chain, it identifies EPS as being in a High Risk category of being phased out of packaging although there is no particular reason

[37] 'The Plastics Landscape: Regulations, Policies and Influencers', by James, G. et al, published by Principles for Responsible Investment 2019, available at: https://www.unpri.org/download?ac=9630 Accessed November 2020.
[38] *The Plastics Landscape: Risks and opportunities along the value chain*, by Gemma Jones, published by Principles for Responsible Investment 2019, available at: https://www.unpri.org/download?ac=10258 Accessed November 2020.
[39] Ibid.

given as to why the author believes this to be the case. Details of the risk categories for all major plastic types are provided in the same table. There are no other references to EPS and none to XPS in the same report.

Table 1: Risk of plastic being phased out of packaging

PLASTIC	RISK OF PHASING OUT
PET	Low
HDPE	Low
PVC	High
LDPE	Medium
PP	Low
PS	Medium
EPS	High
Black plastic	High
Coloured plastic	Medium

Figure 4. Extract from PRI Plastics Report, 2019[40]

In a 2019 analysis[41] by Deloitte, it is noted that regulatory action is being driven by consumer activism. They posit that in light of changing consumer preferences and potential regulatory risks, the rate of growth for plastics will continue but at a much lower level and prices will decrease as a result of less demand.

The Institute for Sustainable Investing, a subsidiary of Morgan Stanley, also published a paper[42] in 2019 which highlights the loss of huge volumes of resources, and therefore monies, through the discarding of waste plastics and notes that "large-scale systemic change in the plastics economy" is required and can bring both risks and opportunities in terms of investment.

In an Analyst Note[43] dated September 2020, the Carbon Tracker Initiative (CTI) noted that the plastic system "is characterised by extraordinary levels of waste" due to the sheer volume of single-use plastics, the extremely low level of recycling (they estimate it to be about 5%), mismanagement and poor design for circularity. With plastic demand having already peaked in OECD countries and developing countries already demonstrating their unwillingness to make the same mistakes relating to the use of single-use plastics, CTI estimates that plastic production will drop in the coming years.

[40] Ibid.
[41] 'The Changing Plastics Landscape: is the chemical industry prepared?', published by Deloitte, 2019, available at: https://www2.deloitte.com/content/dam/Deloitte/us/Documents/energy-resources/us-the-changing-single-use-plastics-landscape.pdf
[42] Plastic Waste: Addressing a Global Economic and Environmental Challenge through the Power of Capital Markets, published by the Morgan Stanley Institute for Sustainable Investing, 2019, available at: https://www.morganstanley.com/pub/content/dam/msdotcom/ideas/future-of-investing-in-plastic-solutions/addressing_the_challenge_of_plastic_waste_2484189_04162019.pdf
[43] The Future's not in Plastics: Why plastics demand won't rescue the oil sector – Analyst Note, by Bond, K. et al, published by the Carbon Tracker Initiative, available to download at: https://carbontracker.org/reports/the-futures-not-in-plastics/

Interestingly, they also note that as governments will need to shore up public finances given the massive costs imposed by the onset of the Covid-19 pandemic, a tax on plastics may be seen as a quick win.

1.6.1 Operation Clean Sweep®

This initiative is led by the plastics industry (the American Chemistry Council and the Plastics Industry Association) and is aimed at all manufacturers of plastics. The objective of Operation Clean Sweep® is to achieve zero pellet, flake and powder loss during the manufacture and transport of plastic items. Many EPS and XPS producers are committed to the programme.

1.7 EPS vs XPS vs Styrofoam™ vs foamed polystyrene vs foamed plastic

While this issue has been mentioned in other parts of the OceanWise report (see OceanWise WP 5.5 report), it is worth repeating here, particularly as it relates to the definitions of, and references to, products in legislation that has already been implemented or is expected to be in the future. While both EPS and XPS are grouped under the category known as thermoplastics, and are rigid in format with a closed-cell structure, there are distinct differences[44] between the two. EPS is composed of small beads fused together whereas XPS is formed from molten material. On close examination it is possible to tell EPS from XPS but at first glance it may not be immediately clear.

Styrofoam™ is a registered trademark of DUPONT[45], and it is used to describe the XPS products which the company manufactures and supplies globally. The company states that Styrofoam™ brand of XPS is not used in the manufacture of food packaging anywhere in the world; this means that any XPS food packaging products on the market are not made from Styrofoam™. It is not clear why and when Styrofoam™ began to be used, erroneously, as a generic term to describe products made from both XPS and EPS. What is clear is that Styrofoam™ has crept into the vernacular, and the term is often used, incorrectly, in bills and laws that ban or restrict the sale, importation and distribution of EPS and XPS single-use products, in countries such as Costa Rica and the Philippines, and US States, such as California.

[44] 'What is Expanded Polystyrene-EPS-Definition', by Nick Connor, published by Thermal Engineering, 22 May 2019, details available at: https://www.thermal-engineering.org/what-is-expanded-polystyrene-eps-definition/ Accessed December 2020.

[45] 'What is Styrofoam?', published by DUPONT, details available at: https://www.dupont.com/building/styrofoam-is-not-a-cup.html Accessed November 2020.

Figure 5. XPS clamshell container

To add to the confusion, the use of the terms foam(ed) plastic and foam(ed) polystyrene is also widespread, particularly if these definitions do not explicitly include or exclude EPS and XPS. This lack of distinction made the task of researching the extent of bans and restrictions more difficult and reflects how policy makers and legislators often use the terms EPS, XPS, Styrofoam™ and foamed polystyrene interchangeably even though EPS and XPS are two quite different materials. It is a concern that legislators possibly intend to include one or both materials in the law but may unwittingly exclude one or other material because of the lack of understanding of their basic differences.

This particular issue is referenced in a UNEP publication[46] on single-use plastics. It notes that "plastic bags and foamed plastic products seem to be seen by governments as the most problematic single-use plastics…". The report then goes on to acknowledge that the term Styrofoam™ is used erroneously to describe many foamed plastic products. However, the authors state that "to make the assessment more easily understandable to non-specialists, this paper will generally not distinguish between the different types of foamed plastics and instead refer to all types of single-use polystyrene foam and other foamed plastic products by the colloquially accepted (but in fact inaccurate) term "Styrofoam"". This approach is somewhat surprising as it perpetuates the belief that these materials are the same or similar enough to be grouped together and that the terms can be used interchangeably. This is simply not the case.

Other notable findings in the report include (references to Styrofoam below are as per the report):

[46] UNEP (2018). Single-Use Plastics: A Roadmap for Sustainability, (Rev. ed., pp.vi;6) available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/25496/singleUsePlastic_sustainability.pdf Accessed October 2020.

- That foamed plastic and Styrofoam containers can contain styrene and benzene, both of which are toxic and carcinogenic and referencing studies that indicate that styrene which can be found in Styrofoam containers can leach damaging toxins, particularly if the container is heated (this issue is examined in more detail in the report);
- That while Styrofoam products can, technically, be recycled but this process can be very challenging and often not financially viable;
- Improvements in waste management systems can improve the effectiveness of bans;
- Public pressure and social awareness can drive the implementation of bans/restrictions.

It should be noted in particular that if the term Styrofoam™ continues to be used incorrectly and inaccurately, there is a risk that companies which produce various EPS and XPS plastic products, especially for food packaging use and containers, may challenge any legislation proposed where the distinction is not made or the technical details do not stand up to scrutiny.

Another UNEP publication[47], which is a study for the insurance industry on how to manage the risks associated with marine plastic litter, among other items, contains no references to polystyrene, EPS, XPS or Styrofoam™.

UNEP[48] published its most recent review of legislation and policies relating to different types of plastic products, which provides an overview of the laws that had been introduced by various countries around the globe, in 2018. The report has three main parts and the section on single-use plastics legislation details the measures which have been undertaken at a national level to restrict and/or ban the use of certain single-use items, including those products made from EPS and XPS. Its key findings included:

- The two main regulatory mechanisms used by governments are either bans/restrictions on the sale and supply of certain products, or instruments such as levies and/or taxes;
- That in 16 countries (as at 2018) specific materials were banned and these were most commonly polystyrene and expanded polystyrene;
- That many of the small island nations have introduced bans/restrictions, with some targeting EPS and/or XPS;
- That 63 countries (as at 2018) have implemented EPR measures such as DRS or take-back schemes (though not specifically for EPS or XPS).

In the Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP) publication of 2019, Guidelines for the monitoring and assessment of plastic litter in the ocean[49], it notes that there is no standard structure used for the categorisation of size of plastic litter. While five general categories are used (fragments, foams, films, lines and pellets) it recommends these are

[47] 'Unwrapping the risks of plastic pollution to the insurance industry', published by UNEP November 2019, available at: https://www.unepfi.org/wordpress/wp-content/uploads/2019/11/PSI-unwrapping-the-risks-of-plastic-pollution-to-the-insurance-industry.pdf Accessed November 2020.

[48] 'Legal Limits on Single-Use Plastics and Micro-Plastics: A Global Review of National Laws and Regulations', published by UNP December 2018, available at: https://www.unenvironment.org/resources/publication/legal-limits-single-use-plastics-and-microplastics-global-review-national Accessed October 2020.

[49] Guidelines for the monitoring and assessment of plastic litter in the ocean, Reports and Studies, published by the Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection, 2019, available at: https://environmentlive.unep.org/media/docs/marine_plastics/une_science_dvision_gesamp_reports.pdf

broken down into finer portions (granules/flakes, EPS/PUR, sheets, fibres/filaments/strands, beads/pellets). There is no reference to XPS.

Less often used but appearing with increasing regularity is the term expandable polystyrene, which is another incorrect term. Expandable means capable of being expanded but EPS has already been subject to an expansion process.

1.8 Packaging Trends

While the OceanWise project is focused on EPS and XPS, it is necessary to examine the backdrop against which the project is operating, in terms of packaging and packaging waste. The trends for 2020 and beyond have been the subject of many articles and papers, by a wide range of stakeholders. The trends can be summarised as follows:

- The European Food Packaging Market was estimated[50] to be valued at more than €3bn in 2020 and is forecast to grow to more than €4bn by 2025, despite the acknowledgement of factors such as "expanded ecological and social mindfulness and strong waste removal" which may constrain the market to a degree.
- The US-based 2020 Sustainable Packaging Report[51] by Kathleen Furore looked at 25% of the largest Fast Moving Consumer Goods (FMCG) producers and noted that 80% of them are working towards making their packaging fully recyclable, and that concerns about plastic waste and packaging were second on a list of issues for their business (report published pre-Covid).
- In another US paper, 2020 Sustainable Packaging State of the World[52], a packaging expert states that the focus will be on reducing packaging waste and notes that chemical recycling is not a "silver bullet".
- The overview of a report[53], which examines the US food packaging market from 2020-2027, estimates that the size of the market will continue to grow, particularly in Asia with the ongoing rise in disposable incomes.

So in spite of public commitments by companies and policies and laws implemented by governments, analysts believe that the global food packaging market, much of which is plastic based, will continue to grow.

[50] 'Europe Food Packaging Market Growth and Forecast (2020-2025)', published by Market Data Forecast, February 2020, details available at: https://www.marketdataforecast.com/market-reports/europe-food-packaging-market Accessed October 2020.
[51] 'The 2020 Sustainable Packaging Report', by Kathleen Furore, published June 2020, available at: https://bioplasticsnews.com/wp-content/uploads/2020/06/Sustainable-packaging-report.pdf Accessed October 2020.
[52] '2020 Sustainable Packaging State of the World' by Rick Lingle, published by Packaging Digest, 27 July 2020, details available at: https://www.packagingdigest.com/sustainability/2020-sustainable-packaging-state-world Accessed October 2020.
[53] 'Food Packaging Market Size, Share & Trends Analysis by Type, by Material, by Application, By Region and Segment Forecasts, 2020-2027', published by Grand View Research, March 2020, details available at: https://www.grandviewresearch.com/industry-analysis/food-packaging-market Accessed November 2020.

1.9 Covid-19/Coronavirus effects on packaging and packaging waste

In the time since the OceanWise project first commenced, the global pandemic has wrought far-reaching changes to society with accompanying consequences for our planet. The sheer volume of non-recyclable, non-reusable personal protection equipment (PPE) that has already been used is quite extraordinary; one article[54] states that hospitals in Wuhan, China, were producing 240 tonnes of used PPE *per day* when the pandemic was at its peak. If that statistic is multiplied across every hospital globally it is clear that millions of tonnes of additional (mainly plastic) waste had to be landfilled or incinerated by the end of 2020. In addition, consumers found themselves unable to bring their reusable cups and containers to those cafés and restaurants which were able to offer a take-away service. While evidence[55] from the World Health Organization (WHO) and others has since established that reusable containers carry no additional risk of Covid-19 transmission, it could take time to persuade wary consumers and employees that they are still safe to use.

The long-term effects are manifold. Consumers who had taken some persuasion to ditch their single-use habits may revert to their old ways. Companies may view the need to improve the recyclability of their packaging as less of a priority. The fossil-fuel industry could see plastic production as an alternative use for their products in the face of falling demand for aviation and other fuels. There are likely to be many corollaries of these developments. For example, existing waste management infrastructure in most countries will struggle with the volumes of waste produced. Improvements to packaging may not be introduced as quickly as hoped and the cost of recycled plastic is likely to remain higher than that of virgin material.

In a more positive light, a joint statement[56] was issued by the CEOs of some of the largest retail brands together with the heads of major Non-Governmental Organisations (NGOs) in June 2020; they all undertook to remain committed to the development of the circular economy, including to the reduction of the use of plastic.

How all of these developments will affect decisions about EPS and XPS use is unclear. The use of EPS specifically for the transport[57] of one of the vaccines has been highlighted by the EPS industry and it is likely that the use of both materials will not be adversely affected by the pandemic. Whether there is any improvement in the management of EPS and XPS at end-of-life remains to be seen.

1.10 Changes to the Basel Convention

The Basel Convention, the full title of which is the "Control of Transboundary Movements of Hazardous Wastes and their Disposal", was adopted in May 1992. The definition of transboundary is the movement from one national jurisdiction to another. Recent amendments to the Convention,

[54] 'Accumulation of plastic waste during Covid-19', by Adyle, T.M., published by Science, Vol. 369, Issue 6509, pp 1314-1315, 11 September 2020, available at: https://science.sciencemag.org/content/369/6509/1314

[55] 'Health expert statement addressing safety of reusables and Covid-19', published by Greenpeace, 2020, available at: https://www.greenpeace.org/static/planet4-international-stateless/2020/07/0c3a6a32-health-expert-statement_updated.pdf

[56] 'A solution to build back better: the circular economy - joint statement', published by the Ellen MacArthur Foundation, 13 June 2020, details available at: https://www.ellenmacarthurfoundation.org/assets/downloads/emf-joint-statement.pdf Accessed March 2021.

[57] 'Vaccines optimally packaged', op-ed by M Hancker, published by IK, 03 February 2021, available at: https://newsroom.kunststoffverpackungen.de/en/2021/02/03/coronavirus-vaccines-optimally-packaged/ Accessed April 2021.

which took effect from 01 January 2021, may have an effect on the plastics recycling industry in particular.

In view of a number of factors including:

- the risks to human health and the environment that could be caused by Hazardous Wastes (HZW);
- the recognition that both the volumes of HZW and the transboundary movement of these wastes were growing;
- the need to protect the environment when disposing of HZW;
- the acceptance that countries should be able to refuse the entry of certain HZW; and
- the risk of poor management and disposal of HZW was greater in developing countries;

the Convention sought to bring about stringent controls for the movement of HZW and its disposal by Parties to the Convention. Since then the Convention has made a number of changes and additions to the text of the agreement.

A Plastic Waste Partnership (PWP) was established to improve and promote the safe disposal of plastic waste and to work on reducing the generation of plastic waste. In 2019, agreement was reached to make changes to Annex II (Categories of Waste requiring special consideration), Annex VIII (Hazardous Waste) and Annex IX (non-Hazardous Waste), which relate specifically to plastic waste. The addition of plastic waste, into these three categories, which includes plastics containing polystyrene, is intended to make the "…global trade in waste more transparent and better regulated" while ensuring that the management and disposal of the waste is done in a manner which protects human health and the environment.

These changes[58] took effect from January 2021 and mark a fundamental shift[59] in how plastic waste will be managed. Countries to which plastic waste is being exported will need to be informed about the composition of the waste and must give their written consent to accepting it. In essence, unless the plastic waste is single-polymer, recyclable and contains no contamination, it may be deemed as hazardous waste. As a consequence, shipments may not be accepted by countries or they will be accepted but as hazardous waste and the resulting charges that go with that treatment.

As the United States of America is not a party to the Convention[60], these changes may affect its ability to export plastic waste to certain countries. The USA is one of the largest generators of plastic waste globally so this is likely to have a serious effect on the management and disposal of its plastic waste.

[58] Basel Convention Plastic Waste Amendments, published by the Basel Convention, details available at: http://www.basel.int/Implementation/Plasticwaste/PlasticWasteAmendments/Overview/tabid/8426/Default.aspx

[59] 'Basel Convention Parties take global lead on mitigating plastic pollution', by Sabaa A. Khan, published by American Society of International Law, 26 August 2019, details available at: https://www.asil.org/insights/volume/23/issue/7/basel-convention-parties-take-global-lead-mitigating-plastic-pollution Accessed December 2020.

[60] 'Recent change to Basel Convention on waste aims to curb dumping of plastic waste', by Leonora Mullet, published by Philip Lee , 10 June 2019, details available at: https://www.philiplee.ie/recent-change-to-basel-convention-on-waste-aims-to-curb-dumping-of-plastic-waste/ Accessed December 2020.

ANNEX II[5]

CATEGORIES OF WASTES REQUIRING SPECIAL CONSIDERATION

Y46	Wastes collected from households
Y47	Residues arising from the incineration of household wastes
Y48[6, 7]	Plastic waste, including mixtures of such waste, with the exception of the following: • Plastic waste that is hazardous waste pursuant to paragraph 1 (a) of Article 1[8] • Plastic waste listed below, provided it is destined for recycling[9] in an environmentally sound manner and almost free from contamination and other types of wastes:[10] - Plastic waste almost exclusively[11] consisting of one non-halogenated polymer, including but not limited to the following polymers: ▪ Polyethylene (PE) ▪ Polypropylene (PP) ▪ Polystyrene (PS) ▪ Acrylonitrile butadiene styrene (ABS) ▪ Polyethylene terephthalate (PET) ▪ Polycarbonates (PC) ▪ Polyethers

5 This amendment to Annex II whereby one new entry was added entered into force on 24 March 2020 (depositary notification C.N. 432.2019), reflecting decision BC-14/12 adopted by the Conference of the Parties at its fourteenth meeting. For information on the status of individual Parties in relation to the amendment/s, please see the Status of Ratifications page on the Basel Convention website.

6 This entry becomes effective as of 1 January 2021.

7 Parties can impose stricter requirements in relation to this entry.

8 Note the related entry on list AA3210 in Annex VIII.

Figure 6. Extract from Annex II, Basel Convention[61]

As polystyrene is the basis for both EPS and XPS, shipments of plastic waste containing one or both of these materials fall under this category, even if it is being exported in compacted form for recycling.

[61] Annex II – Categories of Waste requiring special consideration, Basel Convention, available at: http://www.basel.int/TheConvention/Overview/TextoftheConvention/tabid/1275/Default.aspx

2. *Also decides* to amend Annex VIII to the Basel Convention by inserting a new entry, A3210, as follows:

A3210[10]	Plastic waste, including mixtures of such waste, containing or contaminated with Annex I constituents, to an extent that it exhibits an Annex III characteristic (note the related entries Y48 in Annex II and on list B B3011).

Figure 7. Extract from Annex VIII, Basel Convention[62]

Plastic waste shipments containing EPS and/or XPS could be deemed to be hazardous if there is a mix of waste within the shipment. This could result in:

- shipments of plastic waste not accepted by the country to which the waste is exported; or
- shipments of plastic waste classified as hazardous waste and charged for accordingly.

4. *Decides* to amend Annex IX to the Basel Convention by inserting a new entry, B3011, as follows:

B3011[11]	Plastic waste (note the related entries Y48 in Annex II and on list A A3210): • Plastic waste listed below, provided it is destined for recycling[5] in an environmentally sound manner and almost free from contamination and other types of wastes:[6] - Plastic waste almost exclusively[7] consisting of one non-halogenated polymer, including but not limited to the following polymers: o Polyethylene (PE) o Polypropylene (PP) o Polystyrene (PS) o Acrylonitrile butadiene styrene (ABS) o Polyethylene terephthalate (PET) o Polycarbonates (PC) o Polyethers - Plastic waste almost exclusively[7] consisting of one cured resin or condensation product, including but not limited to the following resins: o Urea formaldehyde resins o Phenol formaldehyde resins o Melamine formaldehyde resins o Epoxy resins o Alkyd resins

Figure 8. Extract from Annex IX, Basel Convention[63]

As EPS and XPS both contain styrene, exports of both of these materials at end-of-life could fall under the above classification, which deems them to be non-hazardous waste once certain specifications are met.

[62] Amendment to Annex VIII, Basel Convention, available at: Basel Convention, available at: http://www.basel.int/TheConvention/Overview/TextoftheConvention/tabid/1275/Default.aspx
[63] Ibid.

The ramifications for the export of end-of-life EPS and XPS are not yet clear as the changes to the Basel Convention commenced at the start of 2021. However, this is likely to be an important factor for consideration by any organisation which already, or plans to, ship compacted EPS and/or XPS to another jurisdiction for recycling.

1.11 Changes to the export of plastic waste by the EU

Also with effect from 01 January 2021, a number of changes[64] to the rules regarding the shipment of plastic waste from the EU were introduced. The export of non-recyclable, hard-to-recycle and hazardous plastic waste to non-Organisation for Economic Cooperation and Development (OECD) countries is now banned. Exporting of plastic waste that can be recycled to non-OECD countries is permitted but subject to strict conditions. The shipment of hazardous and hard-to-recycle plastic waste to OECD countries continues to be permitted but subject to the consent by the importing state.

1.12 Extended Producer Responsibility (EPR)

In a report[65] by the European Court of Auditors on the various actions that the EU has taken to tackle plastic waste, the authors noted that EPR schemes for packaging in general had led to lighter but not necessarily more recyclable packaging. In some cases, the products may be actually less recyclable than they were previously, as different combinations of polymers are used to achieve the same degree of rigidity with less weight. The report also found that the level of efficiency of EPR schemes and the scope of producer responsibility can vary greatly between schemes. No reference was made to EPS or XPS in the review.

No evidence was found of an EPR Scheme specifically for EPS or XPS products. The SUP Directive contains a requirement for EPR schemes to be established for certain products by the end of 2024.

1.13 Assessment of policy impacts / effects

A fundamental issue when trying to tackle the issue of marine litter and beach clean debris is that it can be almost impossible to determine where the litter originated. Marine litter can travel vast distances from its source before it is found on a beach or caught in a fisherman's net or collected as part of a monitoring exercise. This is especially true of EPS and XPS products, given how light they are relative to their size. Another problem is that once littered in the marine environment, the items can break up into smaller fragments, making it challenging to establish from which type of application the fragment originally came and harder to remove them. These factors make it difficult to assess the effectiveness of policies and legislation which are introduced in an effort to reduce the volumes of marine plastic pollution floating in our oceans. For instance, a coastal community in California may implement a ban on certain EPS and XPS single-use containers for food, but it may

[64] Plastic waste shipments: new EU rules on importing and exporting plastic waste', published by the European Commission, 22 December 2020, available at: https://ec.europa.eu/environment/news/plastic-waste-shipments-new-eu-rules-importing-and-exporting-plastic-waste-2020-12-22_en

[65] 'Review No. 4: EU action to tackle plastic waste', published by the European Court of Auditors, 2020, available at: https://www.eca.europa.eu/Lists/ECADocuments/RW20_04/RW_Plastic_waste_EN.pdf Accessed November 2020.

actually result in less of these items, or their fragments, turning up on the beaches of Hawaii or the Philippines.

A review of policy analyses follows.

1.13.1 Assessment Europe - Wales

The Welsh government commissioned an assessment of the potential effects of a ban along the lines of the SUP Directive, bearing in mind that as of 01 January 2021, the UK is no longer obliged to transpose any EU Directives. The Welsh government has already been quite proactive in the areas of addressing marine litter and has developed a zero plastic-to-landfill waste policy. This is in addition to the UK Government's Resources and Waste Strategy which formulates a 25-year plan to determine a strategic direction for plastics.

The assessment, by Resource Futures, was carried out in order to "identify potential economic, social and environmental impacts in Wales of a ban or restrictions on the sale of items in the SUP Directive ban". The report[66] delivers a comprehensive breakdown of the items covered by the Directive but for the purposes of OceanWise we're only concerned with the references to EPS and XPS products.

The study refers to "Food containers made of expanded (or extruded) polystyrene" and goes on to reference industry debate about the inclusion or otherwise of XPS products under Part E. The report authors contacted the Commission's DG Environment to request clarification on the matter and received a response which stated that "extruded polystyrene should be considered a sub-category of expanded polystyrene. Both are non-solid polymers, not the normal form of styrene, but rather a foam. Due to their uses as SUP items, they are often found in the marine environment. Marine litter counting does not distinguish between the two categories".

The rationale for DG Environment's view that XPS should be considered as a sub-category of EPS is not immediately clear as it has never been referred to as a sub-category of EPS in any other literature nor by the manufacturers of the two products. This understanding of the Directive would be profound as it would mean that all XPS food single-use plastic containers would be restricted from sale completely, rather than be subject to an EPR Scheme. However, as XPS is not explicitly mentioned in the text of the Directive it is possible that if challenged, this understanding could require clarification from the European Court of Justice.

As a result of this response from the Commission, the report covers items made from both materials. The authors include the types of containers used to sell hot and cold food for consumption and the small portion pots often supplied alongside with condiments such as sauces. They also note that while beverage containers (used to transport beverages) and beverage cups (used for drinking the beverage) made of EPS (and XPS based on the reference above) are both included in the restrictions, there are no examples of EPS beverage containers so they have analysed the impact on the restriction of the sale of cups only (see OceanWise Work Package (WP) 5.2 Report for use of these in France and Italy where the takeaway coffee culture is not as prevalent as in other countries).

[66] 'Preliminary research to assess the impacts of a ban or restrictions in sale in Wales of items in the EU's single use plastics directive', by Resource Futures, Cole G. et al, Welsh Government GSR report number 32/2020, published May 2020, available at: https://gov.wales/impacts-ban-or-restrictions-sale-items-eus-single-use-plastics-directive

Two scenarios were envisaged:

1. No ban/restriction on sale and use of these items
2. Ban/restriction on sale and use of these items

Factors such as the likely growth in the market for single-use plastics, in the event of no ban, are taken into account. The findings which are most pertinent to this report include:

- There has been a market failure to date, where the economic and environmental costs of the marine litter caused by such items are not reflected in their price to the end user. As Wales tourism is highly dependent on its coasts to attract visitors there are disproportionate economic and tourism impacts in Wales by marine litter;
- According to Marine Conservation Society data (based on the Great British Beach Clean 2019), that while plastic/polystyrene pieces make up 25% of all beach clean litter found, it's very difficult to determine the actual source of the polystyrene pieces - however it is estimated that of all litter found, at least 30% comes from litter which the public did not dispose of correctly;
- That while many outlets have already moved away from EPS and XPS products, by moving to alternatives made from bagasse for instance, an estimated 38 million units of EPS/XPS products were sold in Wales in 2019; (Reference is made in the same section of the report of the trial run by RECOUP to collect and recycle used EPS and XPS food containers at an event to test the feasibility of rolling out a collection scheme – more details of this can be found in the OceanWise WP 5.5 report)
- That EPS and XPS cups for beverages are widely used in hospitals, care homes and prisons (they estimate 26 million units were sold in Wales in 2019) and are generally understood to be disposed of in general waste, rather than be recycled;
- That the businesses most likely to be affected by a ban would be SME's as the majority of food and drink service businesses, and many retail outlets in Wales are small (10-49 employees) and micro (9 or less employees) sized;
- That the takeaway food sector in Wales is growing and therefore, in the event of a ban of certain single-use plastic products, alternatives for cutlery, containers and stirrers for instance, will affect this market;
- That from the stakeholder consultation that took place, there are differences of opinion in terms of how widespread the use of XPS in particular is in food service containers, with some advising it is almost exclusively used in construction only while others argued that XPS is preferable to EPS for service products as it does not "crumble" as easily as EPS. The authors noted that they had found examples of both EPS and XPS food service containers;
- There could be job losses if EPS and/or XPS product manufacturers could not afford to switch to producing items from other materials while there could be job gains if factories in Wales could move to manufacturing non-plastic alternatives;
- There would be a higher cost to the consumer for substitutes for EPS and XPS products but not so much as to make a material difference to the overall cost of the takeaway food item(s);
- The importance of a full Life-Cycle Analysis of any alternatives to ensure that they are indeed less environmentally harmful than EPS and XPS;

- The introduction of a reusable system of containers is not without its drawbacks, particularly in terms of food health and safety and the associated environmental costs of having to wash items i.e. increased water use;
- That replacing EPS and XPS with alternatives has its drawbacks taking into account the LCA of other materials and the food safety concerns raised;
- The effects on marine litter are difficult to determine. Stakeholders in particular voiced their concerns that, in the absence of significant changes to consumer behaviour under the Ban scenario then the alternative materials are still as likely to be found as litter, albeit they may degrade quicker and be less visible than EPS and XPS. However, the lesser amount of plastics generally to become micro-plastics would be seen as a distinct benefit;
- That a ban imposed in one country may not necessarily lead to a reduction of marine or beach litter in that country;
- That any legislation that is passed in Wales must cover in a comprehensive manner both EPS and XPS products, notwithstanding the Commission's stance on XPS (see above).

It should be noted that the Welsh government had already signalled its intent[67] to pass legislation to ban certain single-use items, including EPS food and beverage containers, with effect from 2021, prior to the publication of the analysis.

1.13.2 Assessment Europe - UK

Prior to the legislation being published the Department for Environment, Food & Rural Affairs (Defra) commissioned a study of the effects of a ban on EPS food service products. 'A Preliminary Assessment of the Economic Impacts of a Potential Ban on EPS Food and Beverage Containers – Final Report' was published[68] in October 2019.

The authors of the report used the Defra definition of polystyrene cups and takeaway containers, which based its definition on the SUP Directive. The report states that "While the Directive definition only states *expanded* polystyrene (EPS), for the purposes of this research the definition will also include *extruded* polystyrene (XPS) cups and containers"; however it does not explain the basis for its inclusion. The authors go on to state that "In this research and throughout this report EPS therefore refers to both expanded and extruded polystyrene. The European Commission may wish to consider this issue in further guidance on the directive which is due to be published in July 2020". To date, this guidance has not yet been published.

Four specific types of single-use EPS products were reviewed:

1. EPS beverage cups
2. EPS take-away containers and to-go boxes
3. EPS food trays and chip cones

[67] 'UK's Wales to ban single-use plastics in the first half of 2021', by Matt Tudball, published by ICIS, 18 March 2020, detail available at: https://www.icis.com/explore/resources/news/2020/03/18/10483536/uk-s-wales-to-ban-single-use-plastics-in-the-first-half-of-2021 Accessed October 2020.

[68] 'A Preliminary Assessment of the Economic Impacts of a Potential Ban on EPS Food and Beverage Containers – Final Report', prepared by Resource Futures, published by Defra October 2019, available at: http://sciencesearch.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=220&ProjectID=20292 Accessed November 2020

4. Small EPS cups used for foodstuffs e.g. sauces

When discussing EPS take-away and to-go containers, the authors state that these are "typically made using an extrusion process"; however, use of the extrusion process results in XPS, not EPS products. The confusion about the differences between EPS and XPS is evident here.

The report references a poll taken in May 2018 which found that 70% of adults polled were in favour for a ban on "clam-shaped takeaway containers" which are most likely to be made from XPS.

The findings which are most pertinent to this report include:

- The sales volume for each product type is estimated, for England in 2018, to be:
  - 472 million EPS cups
  - 176 million EPS takeaway containers
  - 185 million EPS trays and chip cones
  - 313 million EPS cups used for foodstuffs
- The most common alternative materials to EPS are paper/board and bagasse, a bi-product from the production of sugarcane;
- The difficulties presented in trying to identify the source of small pieces of EPS found as marine litter, as most pieces found measure between 2.5 and 5.0 centimetres;
- Whole EPS items represent a very small proportion of litter found (cups 0.56% / containers 0.66%);
- The belief by a broad cross-section of stakeholders that "EPS has a high propensity to be littered and that it is not cost-effective to recycle at present", relating to food-use EPS;
- Main manufacturers indicated that if a ban on EPS was imposed, they would find alternative materials to supply the UK market;
- Some stakeholders felt the SUP Directive was poorly worded with vague definitions. Queries were also raised as to the inclusion of EPS but not XPS, given the widespread use of XPS in the production of food service containers;
- Alternative materials to EPS are generally more expensive;
- A general view that EPS food and beverage containers purchased at take-away outlets are littered (although it does not supply any data to support this view);
- That the view of many stakeholders is the possibility of recycling used EPS/XPS food tray and beverage cups, due to contamination, cost and dispersal costs, is not feasible;
- That health service providers and the prison services should be exempted from any ban;
- Acknowledgement that a reduction in use of single-use items was required to address the cause of the problem, rather than switching to other materials, and the importance of a whole Life Cycle Analysis for alternative materials;
- The risk of a legal challenge to any ban proposed, where the text is based on the SUP Directive, is likely to be quite high given the inclusion of EPS but not XPS products;
- Under the Ban scenario, while a reduction in beach litter is envisaged (mainly due to the faster decomposition of paper), no changes to overall consumption nor to littering behaviour are expected.

Overall the report finds that, based on all of the research undertaken, a legislative ban of EPS food and beverage containers is warranted.

1.13.3 Assessment Europe – Ireland/OSPAR

The Department of Housing, Local Government and Heritage (formerly the Department of Housing, , Planning and Local Government) on behalf of the OSPAR Intercessional Correspondence Group on Marine Litter, commissioned an assessment of the policy instruments and incentives affecting the use of single-use items which may go on to become marine litter. The report by Optimize and Eftec[69], published in January 2018, succinctly identifies the nature of many of the issues relating to the management of marine litter including:

- the international nature of the problem (the single-use plastic waste from one country can become the beach litter of another);
- the very broad range and types of litter found;
- the quite varied sources and pathways of litter;
- the times at which a product can become litter during its life cycle;
- the persistence of plastics/polystyrene in the marine environment, compared to other materials such as paper and bagasse;
- poor waste management infrastructure, leading to leakage;
- the relative cost of beach cleans, by local authorities or through the use of volunteers addresses the symptoms but not the causes of marine litter (other than to raise awareness);
- the high cost of recycling plastics and the relatively low costs of new virgin material, resulting in no perceived value in many items which are disposed of carelessly.

Findings include:

- There are a number of EU Directives which indirectly but collectively can tackle the marine litter issue in a number of ways, although the report research was carried out prior to the publication of the EU Plastics Strategy, which specifically tackles marine litter as one of its pillars;
- The importance, if regulatory tools are to be used, such as the prohibition of certain materials, of avoiding unintended consequences where producers of single-use items simply replace one material with another that is as harmful to the environment in equal measures to the one it is replacing;
- That a combination of both regulatory and economic instruments is likely to achieve the objective of reducing the amount of litter generally, which in turn should reduce the volume of marine litter, but they cannot be the only tools used to achieve marine litter volume reduction;
- That an integrated strategy which encompasses a number of pillars such as increasing public awareness, developing markets for recycled plastics, EPR schemes, improved product design and waste management infrastructure, together can deliver the twin objectives of reducing general litter and therefore marine litter.

[69] 'A study to identify and assess relevant instruments and incentives to reduce the use of single-use and other items, which impact the marine environment as marine litter', by Optimize & eftec, published by the Department of Housing, Local Government & Heritage January 2018, available at: https://www.housing.gov.ie/sites/default/files/publications/files/single_use_marine_litter_report_final.pdf Accessed November 2020.

1.13.4 Assessment Europe – EU

EASAC, the European Academies' Science Advisory Council, published its study, Packaging plastics in the circular economy[70], in March 2020. The authors were critical of several aspects of the EPR Schemes already in place for packaging in EU Member States noting previous analyses that had been carried out. Their findings included:

- Low charges to plastics manufacturers often left local authorities with the majority of the costs of disposal;
- Many fees do not reflect the entire costs such as damage caused to the environment through leakage and Greenhouse Gas (GHG) emissions;
- The focus on fees based on weight has led to lighter but not necessarily more recyclable materials and products;
- There is no targeted objective of any EPR scheme to try to minimise leakage of waste packaging into the marine environment;
- The EPR schemes do not apply to the initial producers of the plastic resins themselves.

With the incorporation of clean-up costs and steep eco-modulation fees included in the EPR principles of the SUP Directive, EASAC hopes that this will help the plastic value chain move in a more circular direction.

1.13.5 Assessment – Asia / ASEAN

A paper[71] by the UN Economic and Social Commission for Asia and the Pacific focusing on marine plastic pollution in South Asia published in May 2020 made several recommendations based on the research carried out across eight countries:

- the need for improved waste management infrastructure;
- enhanced enforcement of existing bans on single-use plastic items;
- more cooperation between government, their agencies and NGOs;
- more participation in regional and international initiatives;
- gathering more and better baseline data;
- introduce and strengthen existing economic incentives.

A very comprehensive report[72], on the status of research, legal and policy efforts in the ASEAN+3 grouping of countries (Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, The Philippines, Singapore, Thailand, Vietnam plus the People's Republic of China, Japan and Republic of Korea) was published in 2020. In Part 1, it examined the status of scientific research on pollution caused by marine plastics for the ASEAN+3 countries and an analysis of the findings. Part 2 focused on analysing the gap between the scientific research and the need for data by policy-makers. Among the findings:

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[70] Packaging plastics in the circular economy, EASAC Policy Report 39, published by EASAC, March 2020, available at: https://easac.eu/fileadmin/PDF_s/reports_statements/Plastics/EASAC_Plastics_Web_complete_6May2020_FINAL.pdf

[71] Marine Plastic Pollution in South Asia, by Petro Kapinga, C. & Hin Chung, S. published by ESCAP, May 2020, available at: https://www.unescap.org/sites/default/files/SSWA%20Development_Paper20-02_Marine%20Plastic%20Pollution%20in%20South%20Asia.pdf

[72] Status of Research, Legal & Policy Efforts on Marine Plastics in ASEAN+3: A Gap Analysis at the Interface of Science, Law and Policy, by Lyons, Y. et al, published by National University of Singapore and COBSEA, 2020, available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/33383/NUS.pdf?sequence=1

- that there was a lack of "polymer-specific scientific research (e.g. PP, PE, EPS, PET) based on their presence in the marine environment";
- there remains insufficient granular detail on the "presence and persistence of different polymers in the marine environment and their toxicity to human health and marine eco-systems…";
- there remains insufficient granular detail on the "different sources and pathways of plastic debris into the marine environment which are likely to be specific to activity and geography", which may hinder efforts to develop specific policies and measures to address the issues;
- that steps taken to introduce EPR have been timid at best;
- the need for agreed definitions on areas such as biodegradability;
- that more research and investment is required in waste management and recycling technologies;
- that clean-up operations will continue to be necessary for some time to come.

1.13.6 Assessment – Caribbean Region & Central America

1.13.6.1 Caribbean

In 2019, the UN Development Programme published a report[73] on the status of a range of bans, on bags and other single-use plastic items, which had been introduced across the Caribbean region in the preceding 10 years. In it, the authors consistently refer to Styrofoam even though the accompanying photographs and descriptions are of XPS and/or EPS products, such as plates and cups. It is estimated that Styrofoam makes up about 5% of solid waste in the region and is used predominantly in the food service industry.

The review notes that there are bans and restrictions in place, or in discussion, across a number of countries in the region, at both national and local level. A roadmap was developed for policy makers to use when considering the introduction of restrictions on the use of items, like EPS and XPS products. The five steps consist of:

1. dialogue with stakeholders, identification of substitutes for Styrofoam and involvement of NGOs;
2. announcement of the ban as part of a strategic communications plan;
3. implementation of the ban, including a period of phasing-in the new products and phasing out the banned items;
4. evaluation of effectiveness (though this appears to be on rate of compliance rather than whether or not the objectives of the ban have been achieved);
5. correction where required.

[73] Report on the status of styrofoam and plastic bag bans in the wider Caribbean region, UNEP (DEPI)/CAR WG.39.INF.8.Rev.1, 21 May 2019, available at: http://gefcrew.org/carrcu/18IGM/4LBSCOP/Info-Docs/WG.39_INF.8-en.pdf

1.13.6.2 Trinidad & Tobago

The Economic Commission for Latin America and the Caribbean (ECLAC) published a report[74] in 2020 on the economic implications of a single-use plastic ban using Trinidad & Tobago as a case study. The authors made several findings having carried out surveys of a range of businesses across the islands. Their analysis includes the effects of a simultaneous ban on plastic bags. It should be noted that in the survey sent to business owners they defined single-use plastics and noted "…this includes expanded polystyrene foam (commonly referred to as 'Styrofoam')".

Table 3
Range of single-use plastics in use in Trinidad and Tobago

Product	Material
Burger containers	Styrofoam
Straws (long)	Plastic
Spoons	Plastic
Forks	Plastic
Plates (large)	Plastic
Plates (small)	Plastic
Plates (small)	Styrofoam
Plates (large)	Styrofoam
Bowls (small)	Plastic
Food Containers (medium)	Styrofoam
Food Containers (large)	Styrofoam
Food Containers (small)	Plastic
Food Containers (large)	Plastic
Plastic bags (various sizes)	Plastic

Source: Field Consultant, ECLAC 2020.

Figure 9. Extract from ECLAC Case Study on Trinidad and Tobago[75]

Their findings can be summarised as follows:

- Policy changes and new policies have impacts and so there need to be strategies in place to assist businesses in particular with the transition away from single-use plastics, fiscal incentives may be required and phased implementation is recommended;
- Not all sectors are affected in the same way and businesses within the same sector may respond differently to policy changes, depending on their size and scale;
- The cost of switching to products made from other materials, for instance, compostable items, can be relatively affordable (e.g. less than 2% for a restaurant for instance);
- A cost benefit analysis should include externalities such as the cost of flooding and the harmful effects of micro-plastics i.e. the benefits that can be reaped from a switch away from single-use plastics can deliver tangible benefits;
- An effective policy is one that is coupled with the development of waste management infrastructure to account for the changes in waste types and volumes;

[74] Economic implications of the ban on single-use plastics in the Caribbean; A case study of Trinidad and Tobago, by Phillips W., Thorne E. & Roopnarine C., Studies and Perspectives Series 95, published by ECLAC, 2020, available to download from: https://www.cepal.org/en/publications/46280-economic-implications-ban-single-use-plastics-caribbean-case-study-trinidad-and

[75] Ibid.

- Education and awareness raising for both consumers and businesses, about basics such as what biodegradable actually means, is essential for buy-in and to bring about effective behavioural changes.

1.13.6.3 Assessment – Guatemala

Three years after the enactment of legislation to ban a range of single-use plastic items including bags, straws and expanded polystyrene (known locally as duroport) products, an analysis of the ban and its effects, was used as a case study[76] by Zero Waste Latin America and the Caribbean. The legislation, which prohibited the sale, distribution and use of the items, was enacted in 2016 by the mayor of San Pedro La Laguna, on the shores of Lake Atitlán. A collection point for items which could no longer be used was provided by the municipality and fines were introduced for non-compliance.

Findings included:

- An increased municipal budget was put in place for the development of improved waste management systems and facilities;
- A legal challenge to the ban, which was taken by plastics manufacturers, was ultimately unsuccessful;
- The involvement of students completing community service programmes led to increased public awareness and support;
- Street food vendors in particular were encouraged to switch to using maxan leaves to serve food, an old custom that had died out with the advent of plastic containers;
- The younger generations were harder to convince as they had only known the use of plastic, whereas the older cohort in the community remembered and were more likely to go back to more traditional methods of packaging;

Overall there has been a reduction in the volume of litter in Lake Atitlán which points to the effectiveness of the ban.

1.13.7 Assessment – Pacific Alliance

The Pacific Alliance consists of Mexico, Peru, Chile and Colombia with Ecuador as an observer state. In an article[77] written in October 2020, the authors reviewed the actions taken by the individual countries to tackle single-use plastics. They concluded that member countries share a common vision of single-use plastics but need to implement more coherent national policies to challenge what is a transboundary issue and harmonised standards may help in this regard.

1.13.8 Assessment – Philippines

A paper[78] by the Global Alliance for Incinerator Alternatives (GAIA) was published on the regulation of single-use plastics in the Philippines in 2020, which followed the completion of research and a comprehensive survey on Filipino attitudes to plastics and their use. In it the authors describe the different polymers and refer to PS as polystyrene or Styrofoam and go on to refer to Styrofoam

[76] 'Reducing the use of disposable plastic: San Pedro La Laguna, Sololá, Guatemala, published by the GAIA Alliance, January 2020, available at: https://zerowasteworld.org/wp-content/uploads/06-San-Pedro-La-Laguna_Guatemala_English.pdf

[77] 'A Regional Response to a Global Problem: Single Use Plastics Regulation in the Countries of the Pacific Alliance', by Ortiz A., et al, published by MDPI, October 2020, available at: https://www.mdpi.com/2071-1050/12/19/8093 Accessed November 2020.

[78] Regulating Single-Use Plastics in the Philippines: Opportunities to move forward', published by the GAIA Alliance, 2020, available at: https://www.no-burn.org/wp-content/uploads/Philippine-Policy-Brief-on-SUPs-Ban.pdf

containers. Their policy recommendations include the introduction of a ban on a number of items including “Styro” food containers and the establishment of EPR schemes.

1.13.9 Assessment - USA

There have been a number of papers written about the various policies and laws that have been introduced across North America relating to the use of EPS/XPS products.

The Equinox Project produced a paper[79] in 2017 which analysed the environmental and economic impacts of polystyrene policies in the US. It covers very succinctly why EPS bans have been introduced in many States but also tackles the importance of measuring the effectiveness of those bans. While it recognises the benefits of EPS as a material for food service containers, it identifies several disadvantages of the material. These include its lack of biodegradability and the fact that EPS containers form one of the most visible litter types, particularly along coastlines. The difficulties posed by trying to recycle waste EPS food service containers successfully, due to contamination by food, is also cited. The report notes that bans can bring about a reduction in EPS litter, as experienced by San Francisco, but as many of the bans have only been introduced in recent years, there is a dearth of data in terms of the effectiveness of the bans themselves. Whether or not the intended objectives have been met remains to be seen.

Also in 2017, mb Public Affairs Inc. was tasked[80] with reviewing the impacts of a ban on EPS food service products in the state of Maryland, purely from a fiscal (monetary) perspective. The authors concluded that businesses and therefore consumers would spend more as alternatives to EPS/XPS were generally more expensive; that restaurants, of all food services providers, would be affected the most; and that the alternative products would likely come from further away, i.e. from outside the state, or the USA itself which could have employment ramifications.

In an opinion piece[81] by the CEO of the LA Chamber of Commerce, written in January 2017, he argues that while bans on single-use plastic bags are worthwhile, restrictions on single-use EPS/XPS products are not. He references a study[82] carried out in San Francisco which found that a ban on polystyrene foam cups led to a decrease in litter from this source but an increase in the litter emanating from the replacement cups used. Another study[83] quoted in the piece, carried out in

[79] Recommendations for Reducing or Banning Foam Food Containers, by Heverly, S. et al, published by the Equinox Project, the Center for Sustainable Energy, March 2017, details available at: https://energycenter.org/sites/default/files/Guide_for_Polystyrene_Reduction_Policies.pdf Accessed several times 2020, 2021.

[80] Fiscal Impacts of Prohibiting Expanded Polystyrene Food Service Products in Maryland, by mb Public Affairs Inc, January 2017, available at: https://www.plasticfoodservicefacts.com/wp-content/uploads/2017/10/Maryland-2017-fiscal-impact-study-of-SB-186-and-HB-229.pdf

[81] “Opinion: Blowback: Why polystyrene bans do more harm than good’, by Gary Toebben, published by the Los Angeles Times, 06 January 2017, details available at: https://www.latimes.com/opinion/opinion-la/la-ol-polystyrene-ban-food-containers-blowback-20170106-story.html Accessed November 2020.

[82] Street Litter Re-Audit 2008, The City of San Francisco, by HDR and BVA Inc, published by California Waterboards, July 2008, available at: https://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/stormwater/MRP/02-2012/Comments/Dart/Staff_Exhibits.pdf

[83] Amendment to the Water Quality Control Plan for the Ocean Waters of California to Control Trash and Part 1 Trash Provisions of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays and Estuaries of California, by the Division of Water Quality, Staff Water Resources Control Board, published by Waterboards, not dated, available at: https://www.waterboards.ca.gov/water_issues/programs/trash_control/docs/01_final_sed.pdf

California, concluded that “mere substitution would not result in reduced trash generation if such product substitution would be discarded in the same manner as the banned item”.
The City and County of Honolulu commissioned a study to be undertaken of single-use polystyrene containers and plastic bags, as a ban on such containers was under consideration. The report[84], prepared by the city’s auditor, which was published in December 2018, states that the increased costs as a result of using products made from alternative materials would be passed onto consumers and disproportionately lower-income families. The author, the City’s Auditor, also found that the introduction of a ban would not necessarily lead to a reduction in the volumes of litter found, based on their research of bans imposed in other parts of the USA. He also noted that as there are no industrial composting facilities in the city, the compostable products used as replacements would in fact be sent to the city’s waste-to-energy plant.

An analysis[85] by the packaging company EPE published in March 2019 pointed to two counties in the state of Maine, where local bans on EPS/XPS products had been introduced. The evidence appears to be anecdotal but in both cases referenced, a decline in the volume of EPS/XPS product litter on the ground and in watercourses was reported.

A paper[86] was published in February 2020 by Detritus which was an analysis of EPS food service ware bans across the USA. The author made several findings, on the basis of his research;

- There are 249 ordinances/laws in place;
- The cost of “to-go” containers represents a tiny fraction of the overall sales revenue for restaurants (0.3%-1.3%)
- There are limitations on the use of LCAs as it can be very difficult to complete direct comparisons
- Used EPS/XPS food services ware cannot be reused, is not economical to recycle and cannot be composted
- There are three types of restrictions:
    1) bans or mandated designs for items to be easily recyclable or compostable;
    2) EPR and/or tax/levy for use;
    3) voluntary programmes and education;
- The “undue hardship” clause finds its way into most laws, that there is usually a phase-in time for any changes and that most action has taken place at local and regional government level, rather than at State level.
- There may be unintended consequences of narrowly worded legislation. This has led to some retailers switching from “foam” products to XPS products which fall outside the remit of the ban.

[84] Single-Use Polystyrene Food Containers and Plastic Bag Study, Report to the Mayor and the City Council of Honolulu, by the Office of the City Auditor, published by the Government of Honolulu, December 2018, available at: https://www.honolulu.gov/rep/site/oca/oca_docs/PS_Ban_Study_Final_Report.pdf
[85] Polystyrene Packaging Laws & Regulations, published by EPE USA, 13 November 2019, details available at: https://epe.global/2019/11/13/polystyrene-packaging-laws-regulations/ Accessed November 2020.
[86] Policy Instruments to reduce consumption of Expanded Polystyrene food service ware in the USA, by Wager, T.P. Ph.D., University of Southern Maine, published by Detritus, 10 February 2020, available at: https://digital.detritusjournal.com/articles/policy-instruments-to-reduce-consumption-of-expanded-polystyrene-food-service-ware-in-the-usa/284

- There are no EPR schemes in place for EPS/XPS food service ware and only two ordinances, at local level, impose a levy for the continued use of EPS/XPS products.

In summary the analysis concludes that phasing out the use of EPS/XPS products from food use presents complex challenges and more government intervention is required in order to reduce the volumes of litter caused by waste EPS/XPS food service products.

1. 13.10 Assessment – Global

It would be useful to assess if any reduction in the volume of marine litter has taken place following the introduction of several EU Directives and legislation at both national and regional levels, as envisaged in the Arcadis report[87] that was undertaken in 2013/2014.

2020 saw the publication of the Plastics Policy Playbook: Strategies for a plastic-free ocean[88]. Its objective is to provide policy makers with the tools to develop responses which will lead to a plastic free ocean by 2030. It lists EPS food containers among "problematic formats (which end up frequently in the ocean) and/or materials not currently recycled at scale". It also includes EPS under the measure to remove non-recyclable plastics from packaging on the basis that it is not economically recycled at scale.

Neither XPS nor foamed plastic are referenced in the report.

The report identified that the funding for collection services is often lacking and a framework of measures is required across the value chain in order to improve the economics. Among its recommendations are:

- Finance the collection of waste products, ideally through the implementation of EPR;
- Reduce the use of difficult-to-recycle and non-recyclable single-use plastics;
- Encourage design for circularity;
- Develop treatment and recycling markets.

The report also identifies five principles which are required for any measures taken to be successful:

1. A combination of measures across the entire value chain is required;
2. Engagement and investment is needed in the informal sector (more applicable to developing countries where sorting of waste is still done by hand in poor conditions);
3. Consumer awareness and behaviour change is crucial;
4. Political will is needed at all levels of government;
5. Measures must be enforced at both national and regional levels.

[87] 'Final Report: Marine litter study to support the establishment of an initial headline quantitative headline reduction target – SFRA 0025', by Van Acoleye, M. et al., published by Arcadis for the European Commission, October 2014, available at: https://op.europa.eu/en/publication-detail/-/publication/fbf5bec4-a90b-4eac-af0e-c322ac7f6f63/language-en Accessed November 2020.

[88] Plastics Policy Playbook: Strategies for a plastic-free ocean, published by Ocean Conservancy & Trash Free Alliance, available at: https://oceanconservancy.org/wp-content/uploads/2019/10/Plastics-Policy-Playbook-10.17.19.pdf

The Marine Litter Toolkit for Policy Makers, published by UNEP[89], provides a reasonably comprehensive overview of legislations and measures taken by countries, cities and regions to address the various issues caused by plastic marine litter. There are several references to EPS and XPS; these are in the context of references to bans in many jurisdictions globally.

In its conclusions the report recognises that many states which have sought to implement marine litter policies have done so by building on existing frameworks such as waste management laws. This piecemeal approach may see states introducing laws to ban or restrict specific single-use items, or developing legislation to try to prevent waste entering the marine environment, while acknowledging that this is very difficult to implement effectively. Some states have adopted a more holistic approach which considers the relationship between marine litter legislation and other relevant laws, such as those relating to the management of waste. They also may adopt an inter-agency mechanism approach to coordinate the sectors which play a role in addressing marine litter. Its recommendations include identifying the gaps in regulatory frameworks to help prioritise the actions required, educating all stakeholders and sharing learnings with other actors.

A short paper[90] written by Compliance & Risks, which reviews the actions taken by countries towards single-use plastics, concludes that measures to address their use will continue to be rolled out but that the fragmented nature of policies used internationally has led to a complex regulatory landscape.

Breaking the Plastic Wave[91], a report published by the Pew Charitable Trusts and SYSTEMIQ in 2020 developed 10 Critical Findings as a result of their study. It estimated that about 64% of global plastic production was covered by the scope of the project and of that, 2% was accounted for by "food service disposables", which would include both EPS and XPS containers. It includes "polystyrene foams" in the table of times that could be substituted with paper. In a stark assessment of current global initiatives and commitments, both a private and public sector levels, it projects that plastic flows into the ocean will diminish only slightly in the coming decades.

1.13.11 Assessment - Other

It is also noticeable that many documents, reports and analyses published, covering various aspects of plastic waste management and/or marine litter, policy reviews and analyses, make no reference to EPS, XPS or foamed plastic/polystyrene or only mention them as polymer types. These documents include:

- Policy Connects document[92] which is about a plastic packaging plan for the future;

[89] 'Marine Litter Legislation: A Toolkit for Policymakers', published by UNEP, 2016, available at: https://www.eli.org/sites/default/files/eli-pubs/marine-litter-legislation-toolkit-policymakers.pdf Accessed November 2020.

[90] 'single-use Plastics: Mapping the Current Regulatory Landscape', Whitepaper by Goode, D. published by Compliance & Risks, April 2020, available at: https://www.complianceandrisks.com/whitepaper/single-use-plastics-mapping-the-current-regulatory-landscape/

[91] Breaking the Plastic Wave: A comprehensive assessment of pathways towards stopping ocean plastic pollution, published by Pew Charitable Trusts & SYSTEMIQ, 23 July 2020, available at: https://www.pewtrusts.org/en/research-and-analysis/articles/2020/07/23/breaking-the-plastic-wave-top-findings

[92] 'Plastic Packaging Plan, Achieving Zero 'Waste' Exports', by Jacob Ainscough, published by Policy Connects January 2019, available at: https://www.policyconnect.org.uk/research/plastic-packaging-plan-achieving-zero-waste-exports Accessed November 2020.

- Eunomia's report for City to Sea (NGO) about introducing a pathway to safe and sustainable reuse systems for the food-on-the-go sector;
- Valpak's Sustainability Report 2019[93] (Valpak is the leading packaging compliance PRO in the UK);
- An analysis commissioned by the Society/British Takeaway Campaign[94] of the manifestos launched by each of the main political parties in the UK prior to the general election held there in 2019. The document identified that an EPR system was preferred by two of the parties while a third indicated that a ban on single-use items should be introduced by 2022. However, there was no reference to any specific material, EPS or XPS;
- A study[95] by UNEP on the risks of plastic pollution to the insurance industry in 2019;
- A policy document by the World Wildlife Fund (WWF), No Plastic in Nature[96], which is intended as a practical guide for businesses which want to address plastic use in their supply chain;
- The Plastic Atlas 2019[97] which reviews the many applications of plastics and the policies and measures in play to limit their use;
- The European Environment Agency's (EEA) 2021 publication[98], 'Plastics, the circular economy and Europe's environment', which examines the effects of plastics on the environment and climate and reviews their role in a circular economy;
- edie's Single-use plastics: The 2021 roadmap for sustainable business[99] which provides some useful statistics on single plastic use and ideas to reduce their use in different types of organisation.

1.14 Assessment of EPS / XPS research already undertaken

Despite the prevalence of EPS and XPS as marine litter and the vast array of policies and initiatives aimed at reducing the use of these materials, there has been relatively little in-depth research undertaken in this area. Two reports, that have been compiled based on research carried out specifically on EPS and XPS, warrant further examination.

[93] 'Driven by Tomorrow, Progress, Planet, People', published by Valpak, available to download at: https://www.valpak.co.uk/more/reports/2019-valpak-sustainability-report Accessed October 2020.
[94] 'British Takeaway Campaign: Manifesto Analysis', written by Headland, published in 2019, available at: http://foodservicepackaging.org.uk/resources/ Click on British Takeaway Campaign Manifesto Analysis. Accessed October 2020.
[95] 'Unwrapping the risks of plastic pollution to the insurance industry, published by UNEP & Principles for Sustainable Finance, November 2019, available at: https://www.unepfi.org/wordpress/wp-content/uploads/2019/11/PSI-unwrapping-the-risks-of-plastic-pollution-to-the-insurance-industry.pdf
[96] *No Plastics in Nature: A Practical Guide for Business Engagement*, published by WWF, February 2019, available at: https://www.worldwildlife.org/publications/no-plastic-in-nature-a-practical-guide-for-business-engagement
[97] The Plastic Atlas 2019: Facts and figures about the world of synthetic polymers, published by Heinrich Böll Stiftung, 2019, available at: https://www.boell.de/en/plasticatlas
[98] *Plastics, the circular economy and Europe's environment,* published by the European Environment Agency, 2021, available at: https://www.eea.europa.eu/publications/plastics-the-circular-economy-and/
[99] Single-use plastics: the 2021 roadpmap for sustainable business, published by edie, 24 March 2021, availableto download from: https://www.edie.net/downloads/Single-use-plastics--The-2021-roadmap-for-sustainable-business/541

1.14.1 HELCOM Report

In a similar way to OSPAR, the Baltic Marine Environment Protection Commission (HELCOM) published its Regional Action Plan for Marine Litter in the Baltic Sea[100] in 2015. Its measures to tackle items found as marine litter included RL9, a measure to "compile information on the prevalence and sources of EPS in the marine environment…". HELCOM commissioned the report and prior to its commencement the decision was made to include XPS in the project scope. The final report "Survey of Polystyrene Foam (EPS and XPS) in the Baltic Sea[101]" was published in May 2019 and focused on the HELCOM member countries of Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, Russia and Sweden. The four main objectives of the project were to:

1. Assess the main sources of EPS/XPS to the Baltic Sea;
2. Provide an overview of fate and hazards of EPS/XPS in the marine environment;
3. Compile information on the prevalence of EPS/XPS in the Baltic Sea;
4. Prepare a catalogue of possible measures to reduce the releases of EPS/XPS.

The authors made a number of findings and those most relevant to the OceanWise project are summarised as follows:

- The authors identified the main sources of EPS and XPS as marine litter to be uses in aquaculture, such as floats and buoys, poorly managed waste on construction sites when placed close to ports and rivers and takeaway food and beverage containers;
- The main risk of EPS and XPS as marine litter is ingestion by sea birds and mammals, but also leaching of chemicals, such as flame retardant, into the marine environment;
- Low recycling rates for EPS waste, both packaging and construction in nature, with exceptions such as EPS fish-box recycling in some countries;
- The most common use for EPS fish-box recyclate is in the manufacture of XPS insulation panels;
- The relatively high Calorific Value (CV) of EPS and XPS makes them attractive to incinerator operators (although the authors did not reference that this will depend entirely on the technical set-up of individual incineration/WTE plants);
- The difficulties encountered in gathering accurate data on beach litter and the challenge of trying to identify the original source of EPS and XPS litter once fragmented;
- The general lack of separate collection systems for householders and businesses for EPS and XPS.

The report then outlines a number of measures that could be undertaken to address the issues identified:

- Improved collection infrastructure and worker training on construction sites;
- The phasing out of EPS and XPS disposable/takeaway containers (the report was published prior to the enactment of the EU's SUP Directive);

[100] *Regional Action Plan for Marine Litter in the Baltic Sea, adopted 2015,* published by HELCOM, 2015, available at: https://helcom.fi/media/publications/Regional-Action-Plan-for-Marine-Litter.pdf

[101] 'Survey of Polystyrene Foam (EPS and XPS) in the Baltic Sea - FINAL REPORT', Lassen C., Warming M., Kjølholt J., Jakobsen L.G., Vrubliauskiene N. & Novichkov B. of COWI A/S, Strand J., Field L. & Bach L. of Aarhus University, published by the Danish Fisheries Agency / Ministry of Environment and Food of Denmark, February 2019, available at: https://www.helcom.fi/wp-content/uploads/2019/10/Survey-of-polystyrene-foam-EPS-and-XPS-in-the-Baltic-Sea.pdf

- The replacement of EPS in certain aquaculture uses such as floats and/or the use of rigid plastic to cover EPS floats and buoys;
- Improved management of EPS and XPS during the production and transport phases (it notes the industry-led Operation Clean Sweep® programme);
- The importance of improved collection systems and treatment as part of a wider drive to increase recycling rates;
- The need for better waste management segregation and collection at public events such as festivals;
- The introduction of mandatory municipal collection systems for EPS and XPS;
- The introduction of reusable containers for food deliveries where feasible.

1.14.2 Fauna & Flora International Report

Fauna & Flora International[102] is a wildlife conservation organisation based in England. In 2019 it undertook to conduct an initial investigation into the marine uses of foamed polystyrene and the associated marine pollution risks, with a particular focus on the UK. Its scoping report was published in July 2020, which differentiates between marine-based foamed polystyrene (e.g. used in coastal activities) and land-based foamed polystyrene (e.g. packaging and construction uses). It is one of the few publications to refer to the erroneous use of the term Styrofoam® to describe XPS.

The authors identified the main uses of EPS and XPS in marine-based activities as follows:

- Fish-boxes
- Buoys
- Floats
- Pontoons
- Vessel insulation
- Vessel support blocks
- Personal flotation devices

It is noted that other foamed plastics, such as expanded polyethylene (EPE), expanded polypropylene (EPP) and polyurethane foam (PU), which can be used in some of the applications above may be mistaken for EPS/XPS when found as marine litter.

The findings echo some of those in the HELCOM report (see above):

- EPS fish-boxes remain the packaging of choice for fish processors;
- The use of EPS, wholly or partially, as floats and buoys, and often attached to nets, is widespread;
- There are difficulties in accurately assessing the production amounts, the recycling rates and the litter volumes for both materials;
- The fragmentation of EPS and XPS pieces when they have been in the marine environment for a period of time can make it very difficult to identify the original source of the litter;
- Birds and animals are ingesting EPS and XPS in the marine environment which has potentially negative consequences for the food chain;
- The options for recycling include both mechanical and chemical recycling.

[102] Fauna & Flora International, website available at: https://www.fauna-flora.org/

The potential solutions proffered include the substitution of EPS and XPS by other materials for a number of applications and increasing recycling rates of both materials.

2. ACTIONS - OSPAR CONTRACTING PARTIES

The OSPAR Convention is "the mechanism by which 15 governments and the EU cooperate to protect the marine environment of the North-East Atlantic". The 16 partners agree on measures and actions required to protect and conserve the North-East Atlantic and its resources. Each OSPAR Contracting Party is required to report on the national actions which are taking place in their country.

The 16 partners are:

- Belgium
- Denmark
- Finland
- France
- Germany
- Iceland
- Ireland
- Luxembourg
- The Netherlands
- Norway
- Portugal
- Spain
- Sweden
- Switzerland
- United Kingdom
- The European Union

The Appendices contain details of the specific actions each country is taking in relation to marine plastic litter pollution, EPR Schemes and related areas. References are contained in the text of the Appendices. A summary of the notable actions taking place in OSPAR country members follows:

2.1 Belgium

- One EPR Scheme has trialled the separate collection of EPS for some of its business members;
- A major supermarket group has phased out the use of EPS trays for some of its cold meat products.

2.2 Denmark

- The packaging tax applied by Denmark is higher on EPS than on other plastics.

2.3 Finland

- A research centre has commenced a project to examine the feasibility of recycling waste PS, including waste EPS, back into monomers for use in the production of other plastics.

2.4 France

- The EPS association provides a map of locations where consumers can drop-off their waste EPS packaging;
- Legislation has been passed which banned the use of EPS takeaway boxes with effect from January 2021, ahead of an outright prohibition on disposable takeaway boxes by the end of 2022.

2.5 Germany

- Changes to its existing packaging compliance scheme have led to the requirement for online retailers to participate in packaging EPR schemes.

2.6 Iceland

- With effect from July 2021 a number of disposable plastic products will be prohibited from sale, including containers made of “foam plastic”.

2.7 Ireland

- While the national health service provider has not banned the use of single-use plastics, it recommends the use of reusable crockery and compostable disposable where possible, effectively ruling out the use of both EPS and XPS products;
- Central government departments have been banned from purchasing certain non-compostable, single-use items since 2019, including EPS and XPS products.

2.8 Luxembourg

- The Recycling Centre in the City of Luxembourg accepts “preformed polystyrene components and chips (Styropor®)” when construction waste is deposited.

2.9 Netherlands

- The website of the packaging compliance scheme for households contains guidance for the management of waste EPS;
- The PolystyreneLoop project, focused on recycling waste construction EPS, is based in the Netherlands.

2.10 Norway

- An Environment Agency report on single-use plastics asserts that waste EPS food packaging is not recyclable and that the availability of other materials means that EPS need not be used for this application.

2.11 Portugal

- The government is planning to ban some plastic items including “disposable trays usually wrapped in plastic or expanded polystyrene” used for certain food items from 2021 onwards.

2.12 Spain

- A tax on plastic packaging placed on the market, which would include EPS and XPS, is due to be introduced in 2021.

2.13 Sweden

- The single packaging compliance scheme in place appears to accept food-waste XPS trays in the collection services provided to households.

2.14 Switzerland

- A deposit-return scheme for reusable containers in cafés and food outlets is in place across the country in an effort to reduce disposable plastic use.

2.15 United Kingdom

- The proposed text of SUP legislation in Scotland is based around the text of the EU’s SUP Directive, but also specifically includes XPS as a material, describing it as a subset of EPS, as per a report prepared for the Welsh government;
- The British Plastics Federation provides list of EPS recyclers and their locations throughout the country;
- A large salmon processor discontinued its use of EPS fish-boxes two years ago and now uses a different delivery system for fresh salmon to one of its major customers.

2.16 The EU

- The EU has undertaken a range of actions which are detailed in the first section above.

Collectively, the OSPAR member countries and the EU accounts for a wide range of actions to tackle marine litter, some of which are targeted specifically at the use of EPS and XPS in certain food use applications.

Figure 10. EPS seed propagation tray

3. ACTIONS - REST OF EU

Most of the EU States below have transposed the MSFD, except those countries that do not have any coastlines.

In the remaining EU Member States, generally, the introduction of the "SUP" Directive is going to drive the restriction on placing EPS single-use products on the market. Few countries have taken steps in advance of the due date for the transposition of the Directive to phase out or put restrictions on the import, sale, distribution and use of items made from EPS or XPS. More activity has taken place at regional and local levels, with some individual town and city councils bringing in restrictions in specific areas such as public outdoor events.

What is noticeable is that despite the significant presence of EPS and XPS pieces in marine litter and beach clean data, it is difficult to find references to these materials when packaging compliance schemes and public sector procurement areas are examined. Yet again, there appears to be a disconnect, even at EU Member State level, between the data in terms of what is being found, and steps being taken to address this situation.

It is also noteworthy that in the time between the IUCN reviews which took place in 2016 and those completed in 2019, there is a marked increase in the number of countries with specific marine litter measures in place.

The non-OSPAR members of the EU are:

- Austria
- Bulgaria
- Croatia
- Cyprus
- Czech Republic
- Estonia
- Greece
- Hungary

- Italy
- Latvia
- Lithuania
- Malta
- Poland
- Romania
- Slovakia
- Slovenia

The Appendices contain details of the specific actions each country is taking in relation to marine plastic litter pollution, EPR Schemes and related areas. References are contained in the text of the Appendices. A summary of the notable actions taking place in some of the remaining EU Member States follows:

3.1 Austria

- The packaging compliance scheme operator has a publicly-available comprehensive circular packaging design document.

3.2 Czech Republic

- In Prague, Council-funded outdoor events are prohibited from serving food in single-use plastic products, including EPS and XPS containers.

3.3 Estonia

- In Tallinn, there is a ban on the use of single-use plastic containers, for food service at public events, which would include those items made from EPS and XPS.

3.4 Italy

- The household packaging compliance scheme helps to finance waste EPS collection points, for both businesses and consumers, throughout the country.

3.5 Lithuania

- In Vilnius, the use of single-use plastic plates at Council events is prohibited, which would include EPS and XPS items.

3.6 Malta

- With effect from January 2021, the importation of certain single-use plastic products, including EPS containers and beverage cups, was prohibited.

Figure 11. EPS fish-boxes in use

4. ACTIONS - REST OF EUROPE

A number of European countries are taking steps to tackle marine plastic pollution, by targeting single-use plastics, including in some cases, products made from EPS and XPS.

The countries with policies in place are:

- Albania
- Belarus
- Bosnia-Herzegovina
- Moldova
- Monaco
- North Macedonia
- Russia
- San Marino
- Serbia

The Appendices contain details of the specific actions each country is taking in relation to marine plastic litter pollution, EPR Schemes and related areas. References are contained in the text of the Appendices. A summary of the notable actions taking place in the rest of Europe follows:

4.1 Belarus

- The government has indicated its intention to prohibit the use of disposable tableware by 2023, including items made from polyvinylchloride (PVC) and polystyrene (PS) which would incorporate products made from both EPS and XPS.

4.2 Monaco

- A number of single-use plastic items, including disposable cups and plates, were banned from sale and use by the government, with effect from January 2021.

4.3 North Macedonia

- From January 2020 the government committed to cease central procurement of single-use plastic items, including cups and dishes.

5. ACTIONS - MIDDLE EAST

This region includes some of the driest countries on the planet, where the availability of water cannot be taken for granted. Against this back-drop, single-use plastics can be seen to have their uses, negating the requirement for using precious water resources for washing up. However, activity regarding the management of single-use plastics is taking place in some countries in the region.

The countries which have implemented policies are:

- Egypt
- Islamic Republic of Iran
- Israel
- Jordan
- Oman
- Saudi Arabia
- Turkey
- United Arab Emirates

The Appendices contain details of the specific actions each country is taking in relation to marine plastic litter pollution, EPR Schemes and single-use plastics. References are contained in the text of the Appendices. A summary of the notable actions taking place in the Middle East follows:

5.1 Egypt

- Some town councils in the more tourist-oriented areas of the country have implemented bans on disposable single-use items, which would extend to EPS and XPS products.

5.2 Israel

- One town on the Red Sea, popular with tourists, has taken the decision to prohibit both the sale of food in disposable containers and the use of such containers in the town.

5.3 Saudi Arabia

- Since 2017 some disposable food service products, such as plates and cups, must be made from oxo-biodegradable material, thereby removing both EPS and XPS products from use nationwide.

5.4 United Arab Emirates – Abu Dhabi

- The government of Abu Dhabi intends to declare that is no longer using any single-use plastics by the end of 2021.

6. ACTIONS - ASIA

This region covers some of the most populous places on the planet, with a burgeoning middle-class, which usually leads to increasing amounts of packaging used per capita. Most of the countries in the region have taken steps to address single-use plastic product use.

The countries in which policies have been introduced are:

- Bangladesh
- Brunei Darussalam
- Cambodia
- China
- India
- Japan
- Malaysia
- Myanmar
- Pakistan
- Philippines
- Republic of Azerbaijan
- Republic of Korea
- Singapore
- Sri Lanka
- Taiwan
- Thailand
- Vietnam

According to research for the ASEAN area, many countries simply do not have sufficient waste management infrastructure to deal with the increasing amounts of waste, plastic and otherwise, in a way that is sustainable.

Five countries in the region were identified by the Ocean Conservancy as being responsible for creating more marine plastic pollution in the ocean than the rest of the world combined, in 2015. In its report, Stemming the Tide[103], the five countries identified are:

[103] Stemming the Tide: Land-based strategies for a plastic-free ocean, published by the Ocean Conservancy & McKinsey Center for Business and Environment, September 2015, report available at: https://oceanconservancy.org/wp-content/uploads/2017/04/full-report-stemming-the.pdf

1. China
2. Indonesia
3. The Philippines
4. Thailand
5. Vietnam

Somewhat surprisingly however, the report makes no specific reference to EPS, XPS or foamed plastic.

There have been moves by several countries in the region to stop the importation of waste plastics for recycling, as they themselves face challenges in managing their own domestically produced waste. When China introduced its National Sword policy many countries scrambled to find other markets for their waste plastics and other materials, such as Indonesia and Vietnam. However, many of these countries have now also decided to cease these imports. (See also section on Basel agreement).

The ASEAN grouping of countries (Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, Vietnam) developed a Framework of Action on Marine Debris[104] in 2017, which identified four priority areas:

1. Policy Support and Planning;
2. Research, Innovation and Capacity Building;
3. Public Awareness, Education and Outreach;
4. Private Sector Engagement.

The Appendices contain details of the specific actions each country is taking in relation to marine plastic litter pollution, EPR Schemes and single-use plastics. References are contained in the text of the Appendices. A summary of the notable actions taking place in Asia follows:

6.1 Bangladesh

- The judiciary is leading the way by instructing the government to prepare for the prohibition of the use of certain single-use plastic items by the end of 2022.

6.2 Brunei Darussalam

- A specific tax on imported XPS containers has been introduced in recent years since a 2013 campaign to discourage use of these products has not reduced the demand.

6.3 China

- The government intended to phase out the use of certain disposable plastic items by the end of 2020, specifically including “foam takeout boxes” in the list of banned products;
- It also indicated its intention to discontinue the use of disposable tableware for diners eating in, across the country, by the end of 2025;

[104] ASEAN Framework of Action on Marine Debris, available at: https://asean.org/storage/2019/06/3.-ASEAN-Framework-of-Action-on-Marine-Debris-FINAL.pdf

- The ban on the importation of most plastic waste may affect the market for compacted and recycled EPS and XPS.

6.4 India

- Several provinces have introduced bans on the sale, distribution and use of disposable, single-use plastic items, often referencing foamed products in the legal ordinances implementing the bans;
- Since 2019, ships berthing at ports in India and sailing through its seas are prohibited from using single-use plastics and the description would include both EPS and XPS items.

6.5 Indonesia

- Bali prohibits the use of a number of single-use plastic items, including XPS containers; the implementation of the ban was successfully defended in the country's Supreme Court.

6.6 Malaysia

- Two provinces have introduced bans on certain single-use plastic items, including EPS and XPS products, in recent years.

6.7 Pakistan

- One province indicated its intention in 2018 of prohibiting the use of disposable foamed plates and cups, specifically for food hygiene reasons.

6.8 Philippines

- The use of food service containers made from foamed and other types of plastic is banned in several regions with the prohibition extending to foamed packaging in general in one province.

6.9 Republic of Korea

- There are a number of EPR schemes in place across the country covering both EPS and XPS food and beverage packaging, and medical and electronic goods packaging.

6.10 Sri Lanka

- The manufacture of certain EPS and XPS products for food service use in the country is forbidden.

6.11 Taiwan

- DR schemes have been established in an effort to capture end-of-life EPS floats and buoys which are in widespread use throughout fishing villages and towns.

6.12 Thailand

- Foamed plastic boxes and containers have been banned from use in all of the country's national parks since 2018.

7. ACTIONS - AUSTRALIA & NEW ZEALAND

There is a plastics pact run under the auspices of the Ellen MacArthur Foundation; the ANZPAC Plastics Pact[105], which incorporates Australia, New Zealand and the Pacific Island Nations, was announced in March 2020. Time-bound targets, including the elimination of problematic single-use plastics and an increase in plastics recycling, were published in Q2 2021.

The Appendices contain details of the specific actions each country is taking in relation to marine plastic litter pollution, EPR Schemes and single-use plastics. References are contained in the text of the Appendices. A summary of the notable actions taking place in Australia and New Zealand follows:

7.1 Australia

- One state has introduced a total ban on disposable food service containers, including clam-shell containers and plates made from EPS;
- In another state a wide range of single-use plastics have been prohibited from use, a list which also includes EPS items;
- At national level it is proposed to phase out the use of EPS as loose packaging filling and EPS food and beverage containers by the end of 2022.

7.2 New Zealand

- The government has issued two consultation papers to the general public to get their views on the possible introduction of a ban on several single-use plastic items, including EPS and XPS food service containers.

Figure 12. PS6 recycling symbol on EPS packaging

[105] 'ANZPAC Plastics Pact to tackle plastic waste crisis in Australia, New Zealand and Pacific Island Nations', published by the Australian Packaging Covenant Organisation 02 March 2020, available at: https://apco.org.au/news/20Y4a00000000FBEAY Accessed November 2020.

8. ACTIONS - PACIFIC ISLAND NATIONS

The Pacific Island nations are scattered across a vast area of the Pacific Ocean and comprise both dependent states and independent countries.

The Samoan-headquartered Secretariat of the Pacific Regional Environment Programme[106] (SPREP) is an intergovernmental environmental association which promotes cooperation between countries in the region. It provides policy advice, technical assistance, training and research for its 26-member countries. Through one of its initiatives, Sustainable Waste Actions in the Pacific (SWAP)[107], funding is being made available to explore sustainable financing mechanisms to minimise waste generation.

In a 2018 SPREP publication[108], 'Regulating plastics in Pacific Island Countries: a guide for policy makers and legislative drafters', an analytical framework for legislation was set out, comprising goals, objects, principles, tools and mechanisms, governance and institutions. In its Appendix on Single-Use Plastic Products, the term Styrofoam is used interchangeably with polystyrene and SUP foam to describe takeaway containers for food. The authors note that if plastic foam containers are excluded from bans of SUP takeaway containers, this may actually lead to an increase in the use of such products. They highlight the importance of a phasing-in period during which businesses have time to switch to alternative products and communication with all stakeholders. There is no reference to promoting reusable containers, product stewardship or the potential for the introduction of EPR Schemes.

The Pacific Ocean Litter Project[109] is funded by the Australian Department of Foreign Affairs and Trade and is focused on the delivery of a marine action plan for the region, specifically Pacific Island nations. Its website notes that reducing the source of single-use plastics is a priority and includes polystyrene takeaway containers in the list.

The erroneous use of the term Styrofoam™ to describe takeaway and other food EPS/XPS food containers is noticeable in this region.

The countries which have implemented policies on single-use plastics are:

- Cook Islands
- Federated States of Micronesia
- Fiji
- New Caledonia
- Republic of the Marshall Islands
- Samoa
- Solomon Islands
- Tuvalu

[106] Secretariat of the Pacific Regional Environment Programme, website available at: https://www.sprep.org/
[107] 'Sustainable Waste Actions in the Pacific to make a difference', by Angelicas, published by SPREP, 10 December 2020, details available at: https://www.sprep.org/news/sustainable-waste-actions-in-the-pacific-to-make-a-difference
[108] 'Regulating Plastics in Pacific Island Countries, a guide for policy makers and legislative drafters', published by Apia, Samoa: SREP, 2018, available at: https://d3n8a8pro7vhmx.cloudfront.net/edonsw/pages/6076/attachments/original/1546766817/Regulating_Plastics_in_Pacific_Island_Countries_SPREP_and_EDO_oct_2018.pdf?1546766817
[109] Pacific Ocean Litter Project (POLP), website at: https://www.environment.gov.au/marine/international-activities/pacific-ocean-litter-project

- Vanuatu

The Appendices contain details of the specific actions each country is taking in relation to marine plastic litter pollution, EPR Schemes and single-use plastics. References are contained in the text of the Appendices. A summary of the notable actions taking place across the Pacific Island nations follows:

8.1 Cook Islands

- The government proposes to ban several EPS and XPS food service products from use by 2023.

8.2 Federated States of Micronesia

- The importation of XPS food service items into the country has been banned since mid-2020.

8.3 Republic of the Marshall Islands

- In 2016 the country's parliament passed legislation banning the importation of "Styrofoam" cups and plates.

8.4 Samoa

- The government has banned the importation of XPS cups and containers with the intention of prohibiting the manufacturing, sale and use of such containers at a future date.

8.5 Tuvalu

- Since 2019, the importation and use of certain single-use plastic items, including EPS and XPS items, has been prohibited.

8.6 Vanuatu

- The use of takeaway containers, made from EPS and XPS, has been banned since 2018.

9. ACTIONS - NORTH AMERICA

The continent of North America is home to two of the G20 nations and one of the most populous countries in the world. None of the countries listed has a national policy on the use of disposable plastic items but individual states, cities and towns have implemented wide-ranging sets of laws to curb the use of disposable and single-use plastic items, particularly those designed for food and beverage use.

The incorrect use of the term Styrofoam™ to describe containers and items made from XPS may have started in the United States and it is widespread throughout the region. Not only is it used in the colloquial sense but some legislators have included the term in the ordinances which have been enacted to address the importation, manufacture, distribution, sale and use of single-use plastics.

The countries are:

- Canada
- Mexico
- United States of America

The Appendices contain details of the specific actions each country is taking in relation to marine plastic litter pollution, EPR Schemes and single-use plastics. References are contained in the text of the Appendices. A summary of the notable actions taking place across the North American continent follows:

9.1 Canada

- The city of Vancouver has introduced a surcharge when EPS forms part of waste being deposited in landfill;
- The same city has in place an outright ban on the sale and distribution of EPS and XPS food service containers;
- One province has enacted a law that will prohibit the sale and use of a range of single-use food and beverage containers, including those made from EPS and XPS, by 2025.

9.2 United States of America

- In the state of Arkansas one city council has legislation in place that prevents the council from purchasing single-use EPS cups, plates and bowls;
- At least 14 towns and cities across the state of California have implemented a swathe of laws to regulate the supply, sale, distribution and/or use of EPS and XPS single-use items, mainly targeting food service products, such as clamshell containers. Some of these apply specifically to town and council sponsored events;
- In Connecticut there is a Bill being considered at State level which would ban the use of EPS products in schools and some food service sectors and one town council has banned both EPS food service items and some EPS packaging;
- There are least two towns in the state of Florida that prohibit the use of EPS and XPS food service items on town property or at town-sponsored events;
- In Chicago, the state capital of Illinois, consideration is being given to a ban on the use of certain XPS food service items in food courts;
- The state of Maine was the first US state to introduce a ban, at State level, on a range of EPS products;

- In 2020 the state of Maryland followed in the footsteps of Maine and enacted State-wide legislation to curb the use of EPS packaging for food and beverage purposes;
- The state of New Jersey is set to implement laws at state level that will ban the use of many single-use plastic items, including those made from XPS, for food use, from 2022;
- Also with effect from January 2022, the state of New York will enact legislation to prohibit the use of disposable food service containers and loose-fill packaging that contains EPS;
- The city of New York, following an unsuccessful legal challenge by the food service industry, implemented a ban on the sale and distribution of EPS single-use containers and loose-fill packaging;
- In the state of Ohio, one town council is implementing a programme to phase out the use of EPS and XPS containers by the end of 2022;
- Several towns in the state of Oregon have taken steps to restrict or prohibit the use of EPS and/or XPS food service items, in particular where chlorofluorocarbons (CFCs), have been used in the manufacture of the item;
- The fast-food chain, McDonald's, took a legal challenge against the town of Portland in Oregon, when it enacted legislation to ban EPS and XPS food service containers in 1990. Having lost the case, McDonald's has since discontinued the use of EPS and XPS containers in its US restaurants;
- A Bill has been proposed in the state of Pennsylvania that would see restrictions introduced on the use of EPS and XPS food and beverage containers;
- At least one town in the state of Rhode Island has banned food and beverage containers and packaging materials marked with the recycling 6 (PS) symbol since 2019;
- The state of South Carolina has two towns/cities which have recently introduced legislation to curb the use of several single-use plastic items, including those made from XPS;
- The state of Vermont enacted legislation to restrict the sale and distribution of a range of single-use plastic items in 2019. The law also enabled the established of a Working Group to evaluate the effectiveness of the legislation and other measures to reduce litter volumes;
- In 2014 Washington D.C enacted a ban in place on the sale and use of EPS and XPS disposable food and beverage containers. It has since reported a drop in the volume of such products found as litter in the main river.

Figure 13. XPS takeaway food clamshell containers

10. ACTIONS - CARIBBEAN REGION

The problem of marine litter is as much an issue for the islands in the Caribbean as anywhere else in the world with thousands of tonnes of litter washing up on the beaches there each year. The World Bank Report 'Marine Pollution in the Caribbean: Not a Minute to Waste'[110] stated that studies had found 200,000 pieces of plastic per square kilometre. Of these 1% consisted of "foam food containers". In the UNEP report[111] on bans in the Caribbean, the authors state that "Styrofoam – which is primarily used in the food services industry – makes up about 5% of solid waste".

These figures suggest that marine plastic pollution composed of EPS and XPS plastic products is a problem across the Caribbean Sea and its inhabitants. So it is no surprise that almost every country in this geographical region has already put in place or plans to ban the import and/or sale and/or distribution of polystyrene, EPS and Styrofoam™ products. However, none of the laws, legislation ordinances found reference XPS. As very few, if any, Caribbean states have plastic manufacturing facilities or capacity, an import ban is probably viewed as a simple but effective means of reducing the volume of single-use plastics in circulation.

The benefits of the efforts being made by the countries in the Caribbean, to tackle marine plastic litter, may well be reaped elsewhere. The Gulf Stream brings currents of warm water across the Atlantic Ocean to the nations on the west coast of Europe, but along with those currents comes some of the litter disposed of on the shores of the islands of the Caribbean Sea. Any reduction in the single-use plastic waste discarded in the region should lead to a corresponding decrease in this "long-haul" litter.

Across this region it is noticeable that EPS, foam(ed) polystyrene and Styrofoam™ are terms used interchangeably. There are barely any references to XPS and yet this is the material most likely to be the one used to manufacture the aforementioned foam food containers. For instance the UNEP publication on the status of bans in this region is actually titled "Report on the Status of Styrofoam and Plastic Bag bans in the Wider Caribbean Region" and the document references Styrofoam throughout, never XPS. (see Section 1.6 of report for more on this).

The 2014 Regional Action Plan on Marine Litter Management for the Wider Caribbean Region[112] referenced Styrofoam™ just once and there was no mention of EPS or XPS at all.

In a blog post[113] for the World Bank, the authors reference the World Bank report (see above) on marine pollution and they also reference the fact that more than a third of countries in the Caribbean region have instigated bans on "single-use plastic bags and/or Styrofoam".

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[110] *Marine Pollution in the Caribbean: Not a Minute to Waste*, by Diez S.M. et al., published 2019, available at: http://documents1.worldbank.org/curated/en/482391554225185720/pdf/Marine-Pollution-in-the-Caribbean-Not-a-Minute-to-Waste.pdf Accessed October 2020.

[111] Report on the Status of Styrofoam and Plastic Bag bans in the Wider Caribbean Region, published by UNEP, 04 June 2019, available at: http://gefcrew.org/carrcu/18IGM/4LBSCOP/Info-Docs/WG.39_INF.8-en.pdf

[112] Regional Action Plan on Marine Litter Management for the Wider Caribbean Region 2014, by Chris Corbin et al, published by UNEP, available at: https://www.cbd.int/doc/meetings/mar/mcbem-2014-03/other/mcbem-2014-03-115-en.pdf

[113] 'Caribbean beaches are littered with single-use plastics', by Donna Barne & Florina Pirlea, published by the World Bank, 10 June 2019, details available at: https://blogs.worldbank.org/opendata/caribbean-beaches-are-littered-single-use-plastics Accessed December 2020.

In terms of bans and restrictions a common approach is to remove customs duties, levies and/or VAT on the alternatives to EPS/XPS/Styrofoam™, in order to alleviate any price differential between EPS and XPS products and more sustainable alternatives. Whether this cost saving is passed onto the final consumer remains to be seen.

The range of actions varies quite considerably across the region, with many countries targeting single-use plastic bags only and others focusing on a region of single-use plastics such as straws and food containers.

The countries and territories of the Caribbean region where bans or restrictions have been implemented or are due to be enacted are listed below:

- Anguilla
- Antigua & Barbuda
- Aruba
- Barbados
- Bermuda
- British Virgin Islands
- Cayman Islands
- Curaçao
- Dominica
- Grenada
- Haiti
- Jamaica
- Saint Lucia
- Saint Kitts
- Saint Maarten
- Saint Vincent and the Grenadines
- The Bahamas
- Trinidad & Tobago
- Turks & Caicos

The Appendices contain details of the specific actions each country is taking in relation to marine plastic litter pollution and single-use plastics. References are contained in the text of the Appendices. A summary of the notable actions taking place across the Caribbean region follows:

10.1 Anguilla

- The government intends to phase out the importation and use of a range of single-use plastic items, including XPS containers.

10.2 Antigua & Barbuda

- Using extremely comprehensive language in its legislation, the country has overseen the gradual introduction of a ban on food service products made from EPS and XPS.

10.3 Aruba

- The importation and use of XPS containers by fast-food and other outlets has been banned since 2020.

10.4 Barbados

- Some very specific XPS items, such as egg-cartons and disposable food service containers, have been banned from use.

10.5 British Virgin Islands

- The government has considered a introducing a policy which would see the prohibition of any single-use plastic products which are non-compostable, which would include both EPS and XPS items.

10.6 Dominica

- EPS and XPS single-use items designed for food service are among those that have been outlawed since mid-2019.

10.7 Grenada

- A ban on the use of XPS food service containers was phased in in two stages, following lobbying by industry groups to enact legislation.

10.8 Haiti

- While a number of single-use plastic items, including those made from XPS, have been legally prohibited from sale or use for several years, the law appears not have been enforced.

10.9 Jamaica

- The government established a helpline to assist its citizens in the phasing out of EPS and XPS products which commenced in January 2019.

10.10 Saint Lucia

- A total ban on plastic, which would include EPS and XPS, food service containers was enacted with effect from mid-2020.

10.11 Saint Vincent and the Grenadines

- The legislation, through the wording used, is intended to ban the importation and use of both EPS and XPS items designed for food service.

10.12 The Bahamas

- Single-use products made from EPS and XPS have been explicitly prohibited from sale and use since 2019.

11. ACTIONS - CENTRAL AMERICA

Generally, countries in this region appear to be at opposite ends of the spectrum in terms of tackling marine plastic litter and single-use plastics; either they have taken great strides in tackling single-use plastics, through legislation or other means, or they appear not to be addressing the issue of plastic marine litter at all.

The countries which have implemented policies are:

- Belize
- Costa Rica
- El Salvador
- Guatemala
- Honduras
- Panama

The Appendices contain details of the specific actions each country is taking in relation to marine plastic litter pollution and single-use plastics. References are contained in the text of the Appendices. A summary of the notable actions taking place across the Central American region follows:

11.1 Belize

- The legislation implemented in 2020 to restrict some and prohibit other single-use plastic items is extremely comprehensive, listing the individual items in detail, including those made from XPS.

11.2 Costa Rica

- A broadly-term law comes into effect in 2021 which will see the prohibition on the sale and use of EPS and XPS food containers, although the government has committed to helping industry to move to the manufacture of items from alternative materials.

11.3 Guatemala

- Having started with a provincial ban on certain single-use plastic items, a country-wide prohibition, including products made from EPS, comes into effect during 2021.

12. ACTIONS – SOUTH AMERICA

While nearly every other region in world is taking steps to tackle the issues caused by single-use plastic items, there is comparatively speaking, very little happening on the ground in South America, with generally the smaller countries making the biggest strides.

At a conference hosted in Texas in 2019, a presentation[114] by a plastics industry body noted that "sustainability awareness had arrived" in Latin America and stated that the industry needed to actively explore alternatives for certain plastic packaging materials such as EPS.

The countries in which policies have been introduced are:

- Brazil
- Chile
- Colombia
- Ecuador
- Guyana
- Peru

The Appendices contain details of the specific actions each country is taking in relation to marine plastic litter pollution and single-use plastics. References are contained in the text of the Appendices. A summary of the notable actions taking place across the South American region follows:

12.1 Brazil

- A small island chain off the coast of the country has banned EPS and XPS containers and packaging;
- One of the largest cities has decreed that all food containers must be biodegradable, compostable or reusable, thereby prohibiting the use of single-use plastic containers including those made from EPS and XPS.

12.2 Chile

- Legislation has been considered which would ban the use of non-reusable food containers which would include EPS and XPS food service products.

12.3 Ecuador

- XPS disposable food service containers have been banned on the Galapagos Islands since 2018;
- A range of single-use plastics, including products made from EPS and XPS, are in the process of being phased out.

12.4 Guyana

- The import, sale, distribution and use of any EPS containers for food service has been prohibited since 2015.

[114] Latin Americas Sustainability and Trade, by Jorge O. Bühler-Vidal, Petro Chemical Consulting Alliance, delivered at the SPE Polyolefins 2019 Conference, 24-27 February 2019, available at: https://na.eventscloud.com/eselectv2/backendfileapi/download/358894?id=f87c64dde8e4120db9e40ed56c12d799-MjAxOS0wMiM1YzYzM2ZkOTNlYThk&csrf=1d7f4a704bdb415311a36815dab95f60bf4093ff903b303322b9

12.5 Peru

- Public sector organisations have been banned from the purchase and use of XPS containers since 2018;
- All non-biodegradable plastic products are banned from the country's national parks, with the ban due to be extended to protected areas and beaches.

Figure 14. Waste XPS takeaway food containers

13. ACTIONS - AFRICA

While a large number of countries in Africa have bans or restrictions on the use of plastic bags, some of which have been quite long-standing, the number of countries with bans or restrictions on the use of EPS and/or XPS food service products/containers is quite low.
Waste EPS and XPS are not generally sought after in African countries by recyclers[115].

The countries in which policies have been introduced are:

- Nigeria
- Republic of South Africa
- Rwanda
- Zimbabwe
- Mauritius
- The Maldives
- The Seychelles

The Appendices contain details of the specific actions each country is taking in relation to marine plastic litter pollution and single-use plastics. References are contained in the text of the Appendices. A summary of the notable actions taking place across the African continent follows:

13.1 Rwanda

- A wide-ranging ban on the use of single-use plastic items, which includes EPS and XPS products, was introduced in 2019, with a relatively short transition period.

13.2 Mauritius

- Laws to restrict the use of non-biodegradable plastic items, both by industry and in the home, have been introduced in two phases during 2021.

13.3 The Seychelles

- The importation, sale and use of XPS food service containers have been prohibited since 2017.

Figure 15. EPS cool box

[115] 'Ensuring sustainability in plastics use in Africa: consumption, waste generation and projections', by Joshua O.Babayemi et al, published by Environmental Sciences Europe, Article Number 60, 2019, available at: https://link.springer.com/article/10.1186/s12302-019-0254-5

14. FINDINGS

There is no shortage of policies, frameworks, action plans, initiatives and projects to tackle marine litter, at regional and national and federal levels. The public sector, such as national governments, ministries, local authorities and state agencies, has produced a plethora of policies and legislation in recent years to tackle the use of single-use plastics and/or marine litter. These have involved setting targets to reduce the volume of such products found. A number of initiatives have been announced by companies and industry groups which include commitments to both reduce the amount of packaging used for their products and improve the recyclability of their packaging. NGOs, individually and collaboratively with other organisations, have launched projects and schemes to address these issues as well.

Of these schemes, laws and initiatives, very few have a specific focus on EPS use. Many address the use of XPS single-use plastic food service items, albeit using the incorrect term Styrofoam®. The use of clear and precise definitions in legislation is crucial according to the UNEP publication[116] "Tackling Plastic Pollution", which is a guide for legislators. But many of the laws that have been implemented contain poor or vague definitions, such as "foamed plastic".

Many of these policies and laws lack a holistic approach with a focus on simply substituting one material with another, without planning for the investment required in infrastructure that may be needed to sustainably manage the alternatives envisaged, which is a flaw in the legislation recently passed in Maine (USA). Similarly, some of the legislation introduced, in areas of the Caribbean for instance, lacks the ambition to introduce system change whereby single-use items are replaced by reusable ones where it is feasible to do so.

Much of the legislation that has been introduced is relatively new. Many laws have come about since 2016 and this is evidenced by the progress updates reported to the European Economic Area (EEA) and the G20 in 2019 and 2020.

When a policy to ban the use of EPS and/or XPS products is being introduced, it is often accompanied by a reference to the potential harmful effects to human health from the presence of styrene in EPS and XPS containers. This is particularly the case where the container may be heated (such as in a microwave) or used to hold hot liquids (such as tea/coffee).

While there are many packaging EPR schemes in place, in particular across EU Member States, they tend to be general in nature and no evidence was found of specific EPRs in place for EPS and/or XPS products anywhere.

As many of the measures implemented to restrict the use of EPS/XPS have been introduced in the relatively recent past, there is little evidence to review in terms of how effective they have been. Moreover, reviews to measure their effectiveness are rarely built into policies and legislation. While it may take some years before sufficient data points and samples are available for assessment, there's very little reason for any agency to undertake such an assessment if there is no legislative basis for doing so.

[116] *Tackling Plastic Pollution: Legislative Guide for the Regulation of Single-Use Plastic Products,* published by UNEP & World Resources Institute, 2020, available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/34570/PlastPoll.pdf.pdf?sequence=3&isAllowed=y

XPS as a material is barely referenced in policies and legislation, particularly in relation to its use in food service containers; the erroneous use of the term Styrofoam™ however is ubiquitous. The use of the terms foam(ed) plastic and foam(ed) polystyrene is also widespread. The fact that the incorrect use of the term Styrofoam™ has found its way into legislation is both surprising and concerning. While it is not uncommon for a colloquial term to enter the lexicon, it is very unusual for it to be used when drafting legislation which needs to be clear and unambiguous.

Generally the forecasts for packaging trends are for growth in the market to continue, despite the moves at public sector and private sector levels to reduce packaging amounts. This is mainly due to a rise in the numbers of people who have seen their income levels rise, and therefore their discretionary spending, particularly in populous countries like India.

There has been recognition at global level that OECD countries in particular have been reaching their recycling and other waste management targets by exporting their waste for processing, often to developing countries. This has been done though without ensuring that the infrastructure is actually in place to safely recycle or dispose of the waste once it gets to the importing country.

Contamination by food is one of the main reasons as to why the recycling rate for waste food-use EPS and XPS is so low. While used EPS fish-boxes are recycled at scale in many parts of the globe, used XPS clamshell containers, more often than not, are landfilled or incinerated, or become marine litter.

Figure 16. XPS clamshell container

15. CONCLUSIONS

Every piece of EPS and XPS found in the marine environment is a piece too much. The lack of degradation means that items which make their way into rivers and oceans remain there for the foreseeable future, with the potential to cause harm to both marine life and the humans who depend on it as a food source. EPS and XPS litter has a particularly high negative visual impact and because it floats, it is more visible than other items which might sink.

If the tap of marine plastic pollution entering the ocean was turned off overnight, there would still be millions of tonnes of litter left in our seas. It is vital to rapidly reduce, and, if possible eliminate, further inputs. A concerted effort and investment in collection and recycling infrastructure is warranted given the huge volumes of material with the potential to be recycled.

The marine environment is a transboundary one. A ban on the use of a material(s) in one country will not necessarily lead to a reduction in marine litter found in that country but may benefit the coastline of a nation elsewhere. There is no doubt that the measures to tackle plastic bag use have resulted in less of these bags being spotted as unsightly litter in many countries, in the EU and beyond. To date however, there is little evidence of the reduction of any specific materials in beach and marine litter data that can be correlated to the introduction of a ban of a certain type of material.

The existence of EPR Schemes in all EU Member States for packaging appears to have had little or no effect on the volumes of marine litter found on the coasts of EU countries, so it is difficult to know how effective the EPR under SUP Directive will actually be in reducing marine litter amounts.

The issues with data i.e. is it PS, EPS, XPS or foamed polystyrene that has been measured or counted, and the lack of separate data-sets make it challenging to determine if a policy initiative such as the EU's SUP Directive is actually targeting the right materials and products.

In addition, the continued erroneous use of the term Styrofoam™ and the use of other terms such as foamed plastic will continue to present obstacles when it comes to information collection and collation; gathering and comparing production figures and marine litter data is made more difficult when different terminology is in use.

A connected concern is that, despite all the data points available, it is also difficult to estimate with any accuracy how many EPS and XPS products are manufactured annually, and how many of these actually become marine and beach litter every year and where. Measuring any reduction in the volume found of these products and aligning it to the implementation of the introduction of legislation to restrict the use of EPS and/or XPS products will be a challenge.

There is a requirement in Article 15 of the EU's SUP Directive for the Commission to carry out an evaluation of the Directive eight years after it comes into force i.e. in 2029. For the purposes of clarity a revision of the current text in Part B, to include single-use plastic items made from XPS, could be considered.

Ultimately, with the implementation of a range of measures across a spectrum of policy areas, the 'good environmental status' under the MSFD should be reached by the EU and if not, may reflect poorly-chosen measures and/or other factors over which Member States have little or no control, such as the poor management of waste in non-EU countries.

Most of the reports point to an expected increase in the amount of overall packaging used, albeit with greater use of sustainable, compostable, biodegradable and recycled materials. This is clearly at odds with the SUP Directive for instance, which will place an onus on producers to reduce the volume of packaging placed on the market, so it remains to be seen whether or not that growth continues.

It is not possible to write on the subject of EPS and XPS without reference to the seismic changes that are taking place, not just in Europe, but globally due to the onset of the coronavirus. The volume of single-use plastics discarded, in terms of masks and gloves, has rocketed and already threatens to overwhelm existing waste management and recycling infrastructure. As much of this waste is deemed to be hazardous, incinerators are struggling to cope with the unplanned-for increases in volumes of material that need to be destroyed. The knock-on effects, on areas such as waste management collection systems and recycling investment could herald both positive and negative consequences for EPS and XPS recycling.

At the time of writing, an outline deal on trade between the EU and the UK had been agreed in negotiations, albeit with many areas yet to be substantially agreed; the European Parliament has since ratified the initial deal. How Brexit will affect the movement of waste for recycling and disposal, particularly from the UK to EU Member States, remains to be seen.

The question needs to be asked – what is the purpose of a ban? If the objective is to reduce the amount of a specific type of marine litter, for example EPS and XPS pieces, being found in the marine environment, then a ban is likely to help achieve this objective. However, a ban on its own may not lead to any meaningful reduction in the overall volumes of marine litter found; EPS and XPS may just be displaced by other materials, that might disintegrate into the environment faster and not be as noticeable. However, some alternatives may be less harmful to habitats, marine life food chains and have less potential to become vectors for the spread of invasive species by rafting.

A better approach may not be a material-specific ban, but rather a complete ban on single-use containers in certain circumstances, together with the introduction of a system of DRS for reusable containers. Otherwise there is a risk of just replacing one material with another, which may be less harmful to the environment than EPS or XPS, but is litter nonetheless.

The switch to compostable materials, which can then be processed when contaminated with food, will only work where there is an element of control and a good collection infrastructure in place e.g. at outdoor festivals and food markets and where industrial composting facilities are available.

DRS for reusable containers may work better for dispersed operators such as take-aways, delicatessens and fish and chip shops, where the waste EPS/XPS is more likely to be disposed of in general waste bins, or worse, littered.

The potential for the provision of reusable containers as a service could be explored, whereby operators hire a quantity of reusable containers, which are then replenished by the supplier, taking away the used dirty containers and supplying clean containers. The operator then avoids the cost of funds tied up in the stock of containers and has an incentive to get the containers back.

It is possible that any ban or restriction which specifically references Styrofoam™ (this is particularly prevalent in the Caribbean region) could be challenged, as the term is being used incorrectly.

Businesses which import or produce items made from XPS may well find they can still legally supply their product, depending on the wording of the legislation.

The changes arising from global agreements (such as the BASEL Convention) and at national level (such as China's National Sword Policy[117], which effectively bans the importation of waste plastics for recycling), could extend to compacted EPS and XPS. The Irish company providing the mobile EPS compacting service is exporting its material to mainland Europe for reprocessing/recycling so there is a market for it in Europe. But if changes in regulations result in an increase in the volumes of recycled EPS and XPS produced, recyclers will need to know that there will be demand for the material, knowing it cannot be shipped to China, for example.

There is no one-size-fits-all approach and the SUP Directive lacks some of the flexibility that may be required – different countries and even different regions within countries need to be able to tailor solutions to take account of factors such as demographics, the number of tourists that visit, how many food outlets there are and the existing waste management infrastructure. At the moment the Directive could be viewed as something of a blunt instrument, though the technical guidelines should help to address this issue.

There is an expectation that the introduction of laws and policies will (eventually) lead to a reduction in the volumes of marine litter found in our seas and on our beaches. But in the absence of truly transnational cooperation on such matters and the cacophony, as one writer[118] puts it, of overlapping and in some cases, conflicting agendas by NGOs, think tanks, government institutions, academia and industry, the situation is not likely to improve as quickly it needs to.

[117] 'China's National Sword Policy could spur on global recycling', by Dr Michael Dent, published by IDTechEx, 03 September 2020, details available at: https://www.idtechex.com/de/research-article/chinas-national-sword-policy-could-spur-on-global-recycling/21609 Accessed December 2020.

[118] 'Why efforts to curb plastic waste are failing', by Terry F. Yosie, published by GreenBiz, 17 February 2021, details available at: https://www.greenbiz.com/article/why-efforts-curb-plastic-waste-are-failing?utm_source=newsletter&utm_medium=email&utm_campaign=verge&utm_content=2021-02-24&mkt_tok=MjExLU5KWS0xNjUAAAF7c1E3UgppQmmenpEWN3q8gX4KtH09xFEpTd_cGMPP4Ndz06XEEKt2lR5yzzULDs4GAvagmiivmKx4eEmeIK8F3Tyzj2zDdzquFoOtFiBnk8gNsw Accessed February 2021.

APPENDIX A – OSPAR CONTRACTING PARTIES

A.1 Belgium *(EU Member State – population 11.5 million)*

Belgium comprises three distinct administrative regions; Flanders, Wallonia and Brussels.

In the 2017 IUCN marine plastics litter policies review[119], the authors noted that Belgium (Flanders) proposed to set a target of reducing the leakage of litter into the marine environment by 75% by 2025 and develop a national action plan on marine litter. The authors also noted its participation in the Fishing for Litter Programme.

In its assessment[120] of Belgian waste prevention policies, last updated in 2019, the EEA notes that there is no national waste prevention plan in place; rather each region operates its own programme and together the plans cover the entire country. Under the Brussels plan, the report noted that improving the operational framework of the existing EPR schemes is to be undertaken. In the Flanders plan, there is a focus on tackling littering and innovative waste collection systems in coastal communities. Under the plan for Wallonia, there is a measure to increase the share of reusable packaging as a portion of the overall packaging amount placed on the market.

Belgium's update[121] to the EU as part of the EU's overall submission to the G20 Implementation Framework in 2020, which detailed its progress on several areas relating to the marine environment and the problem of marine plastic litter, did not reference EPS, XPS or foamed polystyrene.

The Flemish "Action Plan on Marine Litter", published[122] in 2017, states that a strategy will be developed to bring about a reduction in the use of single-use (disposable) products by government bodies but makes no specific reference to EPS or XPS. However, since its publication in 2017 there appears to have been no progress reports.

There are two packaging compliance schemes operating in Belgium; Valipac runs the EPR Scheme for industrial users and Fost-Plus for consumer house-holds, both of whom effectively report to the Interregional Packaging Commission. A new initiative, PackItBetter[123] - the Belgian Hub for Packaging Eco-Design, was launched by Valipac and Fost-Plus in 2021.

Valipac was trialling the supply of special bags to enable its members to separate out waste EPS for collection and recycling but at the time of writing, there was no data available as to the success, or otherwise, of the trial.

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[119] 'National marine plastic litter policies in EU member states: an overview', published by IUCN November 2017, available at: https://portals.iucn.org/library/sites/library/files/documents/2017-052.pdf Accessed November 2020.
[120] Country Fact Sheets, EEA evaluations of waste prevention programmes, Belgium November 2019 available at: https://www.eea.europa.eu/themes/waste/waste-prevention/countries Accessed November 2020.
[121] Belgium's submission to the EU, available at: https://papersmart.unon.org/resolution/uploads/submission_of_belgium.pdf Accessed October 2020.
[122] 'Action Plan on Marine Litter', by DG Environment Marine Environment Service, published by the Flemish Government, available at: https://www.health.belgium.be/sites/default/files/uploads/fields/fpshealth_theme_file/action_plan_marine_litter.pdf Accessed November 2020.
[123] PackItBetter, website available at: https://www.packitbetter.be/

Comeos, the trade organisation that represents all sectors of industry across Belgium announced[124] in June 2019 that its supermarket and restaurant chain members would be implementing bans on certain single-use plastics items, the first with effect from December 2019. Included in the list were polystyrene cups, to be banned with effect from summer 2021; the polystyrene cups referred to are likely to be made from EPS, putting Belgium ahead of the planned implementation dates for this element of the 'Single Use Plastics' Directive. As this ban has not yet been implemented, there is no data available on its effectiveness.

One of the largest supermarket retailers in Belgium, the Colruyt Group, replaced[125] EPS trays with cardboard trays for its cold meat selection, although it does not provide a state date for the implementation of this initiative. The statement says that 12.5 million fewer EPS containers have been put into circulation each year as a result.

Brussels initiated a ban[126] on single-use plastics in July 2019, ahead of the SUP Directive time-frame, but there's no indication as to whether EPS and/or XPS products are included in the ban.

The Port of Antwerp participates[127] in the CleanSweep project, to which most EPS and XPS manufacturers are also subscribed. The main objectives are to eliminate pellet loss (there are a number of major plastics manufacturers, including EPS transformers, based in the Port), facilitate the exchange of best practice knowledge in relation to zero pellet loss and to manage clean-up if and when needed.

As an EU Member State, the SUP Directive is due to be transposed by July 2021. The Federal Ministry for Climate Action, Energy, Environment and Sustainable Development is a signatory[128], on behalf of the Belgian Government, to the European Plastics Pact.

As an EU Member State, all public sector procurement is carried out via a tendering system, PublicProcurement[129]. No reference to EPS or XPS could be found in a search of the database of tenders.

[124] Comeos, Belgian trade organisation. Available at: https://www.comeos.be/pressrelease/280256/Winkels-nemen-afscheid-van-plastic Accessed October 2020.
[125] Colruyt Group press release 17 April 2020, available at: https://www.colruytgroup.com/wps/portal/cg/en/home/stories/recycle-packaging-charcuterie-cardboard-sorting/recycle-packaging-charcuterie-cardboard-sorting/!ut/p/z1/vZLLbgIhFIafxYVLchhgbku8dBobY6KpOrNpEFFpFcaRenn7YtpFTdox00VZkJDz_5zbBwXMoTDiqNfCaWvE1rzInphCeFZwshw1Ev6mMfTJ0o5ockogCkUUEjjSreBXJk2PjhbaXVo40rJi9wqVAr5JtbarJHciEq-O-XjSIpqubD-QgdbOR9tbLgmLqVe-rQykHIZSkRTmSIWRRSlKolRQKQgRDDMGIPZbSc4Jj3Mx2GWdh_iLJtgKOob_fTjm8NxZ0w6FONsRP7i__7TPX_u_fGvAhbC7KjVCZ6NrXZ-cZOG43nEMLhXgoeBVMPu0I--FG6DtFlZmDddW3MD5Pp1vy-4B80ap84O5v9L2uw6zDp6gnsC_CWo4-cHwQ0gE2Wg3O0SetEa5YPj6XIOF9G4v-Kt1gdCKq1o/dz/d5/L2dBISEvZ0FBIS9nQSEh/?urile=wcm:oid:ec1ccd5c-39c9-4663-9e87-12ca22a40444 Accessed October 2020.
[126] Brussels Times 02 July 2019 "Brussels is first Belgian city to ban single-use plastics at public events", available at: https://www.brusselstimes.com/belgium/59849/brussels-is-first-belgian-city-to-ban-single-use-plastic-at-public-events-bamboo-cardboard-alternatives/
[127] Marine Litter Solution, Projects, details available at: https://www.marinelittersolutions.com/projects/port-antwerp-pellet-loss/ Accessed October 2020
[128] Signatories to the European Plastics Pact, details available at: https://europeanplasticspact.org/signatories/ Accessed November 2020.
[129] PublicProcurement, website available at: https://www.publicprocurement.be/fr

A.2 Denmark *(EU Member State – population 5.8 million)*

In the 2017 IUCN marine plastics litter policies review[130], the authors noted that Denmark has three measures for marine litter under its Marine Strategy and that it has adopted RAPs for marine litter under both the HELCOM and OSPAR Conventions.

In its assessment[131] of Danish waste prevention policies, last updated in 2016, the EEA noted that a partnership between businesses and organisations on plastic waste was planned. There is no specific reference to EPS or XPS in the overall policy.

HELCOM's Regional Marine Action Plan[132] which was adopted in 2015 included Regional actions addressing land-based sources of marine litter. RL9 under this heading was an action to compile information on the prevalence and sources of EPS in the marine environment, which led to the compilation of a comprehensive report. The "Survey of polystyrene foam (EPS and XPS) in the Baltic Sea"[133], for which Denmark was the lead country, was published in May 2019. Its findings included details about sources of EPS and XPS in the Baltic Sea, waste management and recycling of EPS and XPS and a catalogue of possible measures to reduce releases to the environment. The suggested measures covered areas such as improved collection and recycling schemes, implementation of the EU's 'Single Use Plastics' Directive, substitution of EPS and XPS with other materials and return and reuse of food delivery boxes. A more detailed analysis of the report is contained elsewhere in this report.

There does not appear to be a national action plan on marine plastic waste. In 2017 the government announced[134] that a national plan of action was required but that does not appear to have become a published plan. In its Marine Strategy II document[135], published in 2019, Marine Litter is listed as a Topic and notes that the volume of marine waste needs to be reduced and that the loss of fishing gear needs to be prevented. There is no reference to EPS/XPS.

There is no packaging compliance scheme[136] in Denmark as it already had a packaging waste management system in place when the EU introduced the Packaging and Packaging Waste Directive. The management of waste packaging is carried out by individual municipalities. In other research carried out for the OceanWise project, the contact for the Danish EPS Association advised that there is an EPR Scheme in place for producers of packaging but they are only obliged to take back EPS

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[130] 'National marine plastic litter policies in EU member states: an overview', published by IUCN November 2017, available at: https://portals.iucn.org/library/sites/library/files/documents/2017-052.pdf Accessed November 2020.
[131] Country Fact Sheets, EEA evaluations of waste prevention programmes, Denmark October 2016 available at: https://www.eea.europa.eu/themes/waste/waste-prevention/countries Accessed November 2020.
[132] 'Marine Litter Action Plan', Baltic Marine Environment Protection Commission, adopted in 2015, available at: https://helcom.fi/media/publications/Regional-Action-Plan-for-Marine-Litter.pdf Accessed October 2020.
[133] 'Survey of Polystyrene Foam (EPS and XPS) in the Baltic Sea - FINAL REPORT', Lassen C., Warming M., Kjølholt J., Jakobsen L.G., Vrubliauskiene N. & Novichkov B. of COWI A/S, Strand J., Field L. & Bach L. of Aarhus University, published by the Danish Fisheries Agency / Ministry of Environment and Food of Denmark, February 2019, available at: https://www.helcom.fi/wp-content/uploads/2019/10/Survey-of-polystyrene-foam-EPS-and-XPS-in-the-Baltic-Sea.pdf
[134] State of Green, Ministry of Environment and Food of Denmark, 28 April 2017, available at: https://stateofgreen.com/en/partners/ministry-of-environment-and-food-working-for-environmental-protection/news/the-danish-government-to-formulate-plan-of-action-against-plastic-pollution/ Accessed October 2020
[135] 'Danish Marine Strategy II – Focus on a clean and health marine environment', published by the Ministry Environment and Food of Denmark in 2019, available at: https://mfvm.dk/fileadmin/user_upload/MFVM/Natur/Havstrategi/Danish_Marine_Strategy_II_UK.pdf Accessed November 2020.
[136] Packaging waste legislation in Denmark, posted by Packaging Recovery Organisation Europe (PRO Europe), details available at: https://www.pro-e.org/Denmark Accessed November 2020.

transport packaging i.e. the EPS that comes on deliveries of white goods and electronics. This is also known as tertiary packaging. It was reported[137] in April 2020 that the Danish government plans to expand the EPR obligations for producers, by introducing an amendment to its Environment Protection Act which would transpose the EU Packaging Directive 852/2018.

In a 2019 OECD Working Paper[138], there is reference to a weight-based packaging tax in Denmark which levies a higher rate (DKK20.35 per kg) of tax on EPS than on other materials. The lowest packaging tax rate applies to recycled plastics.

The Danish Plastic Industry Association has published a Design Guide[139] for the reuse and recycling of plastic packaging for private consumers, so it is aimed at producers of single-use and other plastic containers and packaging. The guide references EPS several times and notes that EPS can be recycled easily, particularly from food to non-food applications although it does not provide specific examples. A case study is referenced whereby a food company uses EPS boxes for its deliveries; they are returned, washed and re-used up to 20 times. There is no reference to XPS.

It was announced[140] that MATChE, an initiative of the Technical University of Denmark, had partnered with the EPS manufacturer, BEWiSynbra, to develop a take-back strategy for EPS so it could be recycled or reused at scale. Using MATChE's Toolkit BEWiSynbra is establishing take-back loops with key customers throughout Denmark so used EPS can be reused or recycled.

As an EU Member State, the SUP Directive is due to be transposed by Denmark by July 2021. The Ministry of Environment and Food is a signatory[141], on behalf of the Danish Government, to the European Plastics Pact.

As an EU Member State, all public sector procurement is carried out via a tendering system, SKI[142]. No reference to EPS or XPS could be found in a search of the database of tenders.

[137] 'New Packaging Obligations for Sellers in Denmark, by Andy Steeds, published by spheraEC4P 07 April 2020, available at: https://ec4p.com/resources/news/new-packaging-obligations-for-sellers-in-denmark Accessed November 2020.
[138] 'Policy approaches to incentivise sustainable plastic design – Environment Working Paper No. 149', by Watkins E. et al. Published by the OECD Environment Directorate 12 July 2019, available at: https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=ENV/WKP(2019)8&docLanguage=En Accessed November 2020.
[139] 'Design Guide; Reuse and recycling of plastic packaging for private consumers', by the Network for Circular Plastic Packaging, published by the Danish Plastics Association November 2019, available at: https://plast.dk/wp-content/uploads/2019/12/Design-Guide-Reuse-and-recycling-of-plastic-packaging-for-private-consumers-english-version-1.pdf Accessed November 2020.
[140] 'Scaling up a take-back model for the reuse or recycling of EPS packaging', published by MATChE, details available at: https://www.matche.dk/en/191/Scaling-up+a+take-back+model+for+the+reuse+or+recycling+of+EPS+packaging Accessed January 2021.
[141] Signatories to the European Plastics Pact, details available at: https://europeanplasticspact.org/signatories/ Accessed November 2020.
[142] SKI public procurement, website available at: https://www.ski.dk/

A.3 Finland *(EU Member State – population 5.5 million)*

All of Finland's coasts border the Baltic Sea and the Baltic Marine Environment Protection Commission, known as HELCOM, is based in Helsinki. Their Regional Marine Action Plan[143] which was adopted in 2015 included Regional actions addressing land-based sources of marine litter. RL9 under this heading was an action to compile information on the prevalence and sources of EPS in the marine environment, which led to the report referenced previously.

In the 2017 IUCN marine plastics litter policies review[144], the authors noted that Finland has a marine strategy which runs to 2021, subscribes to the London and MARPOL Conventions and is part of the Nordic programme to reduce the environmental impact of plastic.

In its assessment[145] of Finnish waste prevention policies, last updated in 2019, the EEA noted that there was a plan to study the sources of land-based marine pollution and to prepare a report which identified both the barriers to and the potential for packaging reuse.

As an EU Member State, Finland provided an update[146] to the EU as part of its overall submission to the G20 Osaka Blue Vision. Finland advised of its achievements including the development of a plastics roadmap (see below), continuous collaboration with both HELCOM and the EU on marine litter monitoring, an increase in the number of scientists working in the area of marine litter and the completion of a survey regarding sources and pathways of marine litter.

None of the above documents contain any specific references to EPS or XPS.

As a Member State Finland will be obliged to transpose the EU's SUP Directive. The Finnish Ministry of the Environment is also a signatory[147], on behalf of the Finnish Government, to the European Plastics Pact.

There is a packaging compliance scheme, Rinki[148] in place for businesses and consumers. The FAQ section[149] on the website states that EPS packaging can be put in the household plastic recycling container but indicates that this material is not recycled. It does state however that most industrial EPS is recycled but provides no further details about this. There is no reference to XPS.

The Ministry of the Environment published its Plastics Roadmap for Finland[150] in 2019. This was the output of a "broad-based" Working Group which was created for the purpose and preparatory work

[143] 'Marine Litter Action Plan', Baltic Marine Environment Protection Commission, adopted in 2015, available at: https://helcom.fi/media/publications/Regional-Action-Plan-for-Marine-Litter.pdf Accessed October 2020.
[144] 'National marine plastic litter policies in EU member states: an overview', published by IUCN November 2017, available at: https://portals.iucn.org/library/sites/library/files/documents/2017-052.pdf Accessed November 2020.
[145] Country Fact Sheets, EEA evaluations of waste prevention programmes, Denmark October 2016 available at: https://www.eea.europa.eu/themes/waste/waste-prevention/countries Accessed November 2020.
[146] Finland update, G20 Towards Osaka Blue Ocean Vision, posted 02 April 2020, available at: https://g20mpl.org/partners/finland Accessed November 2020.
[147] 'Signatories to the European Plastics Pact, details available at: https://europeanplasticspact.org/signatories/ Accessed November 2020.
[148] Rinki, details available at: https://rinkiin.fi/home-temp/
[149] FAQ Section – plastic packaging, Rinki, available at: https://rinkiin.fi/for-households/faq/ Accessed November 2020.
[150] 'Reduce and Refuse, Recycle and Replace; a Plastics Roadmap for Finland', published by the Ministry of the Environment (undated), available at: https://muovitiekartta.fi/userassets/uploads/2019/03/Reduce-and-refuse-recycle-and-replace.-A-Plastics-Roadmap-for-Finland.pdf Accessed October 2020.

included a large range of stakeholders. There is no reference to EPS, XPS or foamed polystyrene in the document.

The VTT Technical Research Centre of Finland announced[151] in September 2020 that it, together with its research and business partners, is launching the MoPo (Multi-technological recycling for polystyrene) project, with a budget of €964,000. The project will work on developing a "technically and economically feasible solution to the recycling of polystyrene waste in Europe". The news item references both polystyrene, for its use in yogurt pots, and EPS (foam) for its use in insulation and damp proofing. It will examine options for both mechanical and thermochemical recycling.

In 2018, the VTT Technical Research Centre announced[152] the development of a foam-formed material that is cellulose based, specifically as an alternative to EPS but it is not clear if the material ever went into commercial production.

There are a number of Finnish companies examining alternative material options. One company is producing a material which could replace the use of EPS and XPS in some functions such as packaging for fruit and vegetables and fish-boxes[153]. It was announced[154] in September 2020, that the same company had developed a fibre-based foam material which could have uses in the packaging industry instead of EPS and foamed polyethylene.

In 2019 another company announced[155] that its pilot phase following a competition win, to develop an alternative to EPS takeaway containers, had been completed successfully.

As an EU Member State, all public sector procurement is carried out via a tendering system, HIL MA Public Procurement[156]. No reference to EPS or XPS could be found in a search of the database of tenders.

[151] 'Polystyrene can be circulated back to raw material: MoPo project develops collection and reuse of the waste in Europe', published 16 September 2020, VTT, available at: https://www.vttresearch.com/en/news-and-ideas/polystyrene-can-be-circulated-back-raw-material-mopo-project-develops-collection-and Accessed October 2020.
[152] 'Creating a bio-based and easily recyclable packaging material', published 20 August 2018 by VTT, available at: https://www.vttresearch.com/en/news-and-ideas/creating-bio-based-and-easily-recyclable-packaging-material Accessed October 2020.
[153] Storaenso, details available at: https://www.storaenso.com/en/products/corrugated-packaging-solutions/ecofishbox?cc-option-checkbox=Essential
[154] 'Bio-based foam to replace oil-based foams in packaging' published 10 September 2020 by forest.fi, available at: https://forest.fi/products-services/bio-based-foam-to-replace-oil-based-foams-in-packaging/ Accessed October 2020.
[155] 'Metsä Board's takeaway packaging in a Finnish innovation competition – piloting phase completed with promising results' published 09 July 2019 by Metsä Board, details available at: https://www.metsaboard.com/Media/Product-news/Pages/metsa-boards-takeaway-packaging-in-a-finnish-innovation-competition-piloting-phase-completed-with-promising-results.aspx Accessed October 2020.
[156] HIL MA Public Procurement, website at: https://www.hankintailmoitukset.fi/fi/

A.4 France *(EU Member State – population 67 million)*

In the 2017 IUCN marine plastics litter policies review[157], the authors noted that the national waste prevention plan (2014-2020) recognises the importance of good coordination between policies, the management of waste and the aquatic environment and efforts being made to prevent the theft of plastic waste from sorting centres.

In its assessment[158] of French waste prevention policies, last updated in 2016, the EEA noted plans to further develop existing EPR schemes and an action plan on marine litter.

As a member of the G20 group of nations, France is a partner to the Implementation Framework for Actions on Marine Litter and its corresponding Osaka Blue Vision. In its most recent update[159] to the G20, France advised of its achievements under G20 Osaka Blue Vision, which include the establishment of a circular economy roadmap (with a target of "100% of plastics to be recycled in 2025"), the development of fishing for litter activities by fishermen and a focus on awareness raising across all sections of society about the negative effects of marine litter.

Packaging compliance is run by two organisations, Eco Emballages[160] and CITEO[161]. CITEO references the polystyrene recycling plant that was announced in 2018, to be built by a consortium of partners including Total and Syndifrais (see OceanWise WP 5.5 report). Consumers must take their waste household EPS packaging to a recycling centre (drop-off point locations are provided by ECOPSE[162] the EPS industry association in France) while industrial users have the facility to have their waste EPS collected. There is no reference to XPS.

Even with the passing of the SUP Directive at EU level, France pushed ahead with its own legislation to tackle plastic pollution, the Anti-Waste Law for a Circular Economy[163], which became law in February 2020. It contains about 50 measures under five separate sections:

1. Phasing out disposable plastic by restricting the supply and use of certain single use plastic products - EPS boxes are included in the list;
2. Better informing consumers;
3. Fighting against waste and for solidarity reuse;
4. Acting against planned obsolescence;
5. Better production.

[157] 'National marine plastic litter policies in EU member states: an overview', published by IUCN November 2017, available at: https://portals.iucn.org/library/sites/library/files/documents/2017-052.pdf Accessed November 2020.
[158] Country Fact Sheets, EEA evaluations of waste prevention programmes, France October 2016 available at: https://www.eea.europa.eu/themes/waste/waste-prevention/countries Accessed November 2020.
[159] France update, G20 Towards Osaka Blue Ocean Vision, posted 02 April 2020, available at: https://g20mpl.org/partners/france Accessed November 2020.
[160] Eco Emballages, details available at: http://www.ecoemballages.fr/
[161] CITEO, details available at: https://www.citeo.com/
[162] ECOPSE, website available at: https://ecopse.org/accueil/valoriser-ses-dechets-de-pse/
[163] 'La loi anti-paspillage pour une économie circulaire', Ministère de la Transition Ecologique, available at: https://www.ecologie.gouv.fr/loi-anti-gaspillage-economie-circulaire-1 Accessed October 2020.

The Ministry for the Ecological Transition published a guidance document[164] for what the legislation will mean for French people. The implementation date for Part 1 is 01 January 2021 and will ban the use of EPS boxes in fast-food and other takeaway operators. By January 2023, these operators will have to implement the use of reusable containers, rather than allowing alternative or substitute materials to EPS.

This legislation will force food service providers who currently distribute food to move away from EPS in the short-term but given that no disposable food containers will be allowed by the end of 2022, some may transition to reusable containers. This is one of the only laws which both prohibits the use of EPS containers and subsequently bans all disposable containers, regardless of the material used.

There is a National Plastics Pact in operation which was launched[165] in February 2019, to which the French government, several companies and NGOs have committed. In the accompanying document[166] EPS is noted as problematic and is to be differentiated from other polystyrene for which recycling channels are to be developed. It goes on to state that EPS is to be banned from food containers and single-use cups. There is no reference to XPS in the document.

The French Ministère de la Transition écologique et solidaire, on behalf of the French Government, is also a signatory[167] to the European Plastics Pact.

As an EU Member State, all public sector procurement is carried out via a tendering system French public procurement, Achatpublic[168].

[164] 'The Ani Waste Law in the Daily Lives of the French People; What does that mean in practice?', published January 2020 by the Ministère de la Transition Ecologique, available at: https://www.ecologie.gouv.fr/sites/default/files/en_DP%20PJL.pdf Accessed October 2020.
[165] 'National Pact on plastic packaging: the Government, French companies and NGOs commit, published by the Ministère de la Transition Écologique 21 February 219, details available at: https://www.ecologie.gouv.fr/pacte-national-sur-emballages-plastiques-gouvernement-des-entreprises-francaises-et-des-ong Accessed November 2020.
[166] Pacte National sur les Emballages Plastiques, 21 février 2019, available at: https://www.ecologie.gouv.fr/sites/default/files/2019.02.21_Pacte_National_emballages_plastiques.pdf
[167] Signatories to the European Plastics Pact, details available at: https://europeanplasticspact.org/signatories/ Accessed November 2020.
[168] Achat Public, website available at: https://www.achatpublic.com/

Figure 17. EPS fish-boxes in use at Parisian fish-market

A.5 Germany *(EU Member State – population 83 million)*

In the 2017 IUCN marine plastics litter policies review[169], the authors noted that Germany subscribes to the OSPAR and HELCOM Conventions, has a commitment to the reduction of land-based marine litter, intends to adopt the Fishing for Litter approach and as a result of its nationwide implemented systems for waste collection, environmental problems caused by littering tend to be quite low.

In its assessment[170] of German waste prevention policies, last updated in 2019, the EEA noted the measures being taken to mobilise consumers for "waste-light consumption patterns".

As a member of the G20 group of nations, Germany is a partner to the Implementation Framework for Actions on Marine Litter and its corresponding Osaka Blue Vision. In its most recent update[171] to the G20, Germany advised the Federal Government has a five-point plan which includes a target of less plastic and more recycling, referenced the introduction of the new Germany Packaging Act (more details below) and noted its assistance to other countries, including Tunisia and Algeria, in relation to the introduction of EPR schemes for packaging waste.

Germany has had a packaging compliance scheme in place for many years. Changes to the scheme came into effect from January 2019. One of these changes[172] resulted in online retailers having an

[169] 'National marine plastic litter policies in EU member states: an overview', published by IUCN November 2017, available at: https://portals.iucn.org/library/sites/library/files/documents/2017-052.pdf Accessed November 2020.
[170] Country Fact Sheets, EEA evaluations of waste prevention programmes, Germany July 2019 available at: https://www.eea.europa.eu/themes/waste/waste-prevention/countries Accessed November 2020.
[171] Germany update, G20 Towards Osaka Blue Ocean Vision, posted 02 April 2020, available at: https://g20mpl.org/partners/germany Accessed November 2020.
[172] 'The new German Packaging Act is here – and it's particularly important for online retailers', posted by DerGrünePunkt, available at: https://www.gruener-punkt.de/en/packaging-licensing/packaging-act.html Accessed November 2020.

obligation to participate in a packaging compliance scheme and a requirement for all participants to register with a central database[173]. The changes were introduced to reflect higher recycling targets and to put more onus on retailers to favour recyclable packaging. There is no reference to EPS or XPS in the new Act.

As an EU Member State, Germany will be obliged to transpose the SUP Directive. In June 2019, when the Directive was close to being passed, the German Association for Plastic Packaging and Films issued a press release[174] to counter-act the suggestion that the SUP would ban all EPS packaging", which had been reported in a newspaper. The release clearly states that EPS containers used for the provision of food for immediate consumption only would be banned under the incoming Directive. It goes to remind customers that consumer waste EPS can be dropped off at collection points for "reprocessing".

The Fraunhofer Institute for Process Engineering and Packaging, based in Freising, has developed the CreaSolv® Process[175] which is being used by the Polystyrene Loop Project in the Netherlands. It allows for the separation of composites in a range of post-consumer waste, including EPS, and leads to more effective recycling of the waste.

The German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, on behalf of the German Government, is also a signatory[176] to the European Plastics Pact.

As an EU Member State, all public sector procurement is carried out via a tendering system, e-Vergabe[177]. No reference to EPS or XPS could be found in a search of the database of tenders.

[173] Stiftung Zentrale Stelle Verpackungs Register, website available at: https://www.verpackungsregister.org/en?r=1
[174] 'airpop ' polystyrene packages still permitted', published by Kunststoffverpackungen 04 June 2019, available at: https://newsroom.kunststoffverpackungen.de/en/2019/06/24/airpop-eps-polystyrene-packages-still-permitted/ Accessed November 2020.
[175] CreaSolv® Process, details available at: https://www.ivv.fraunhofer.de/en/recycling-environment/recycling-plastics.html
[176] Signatories to the European Plastics Pact, details available at: https://europeanplasticspact.org/signatories/ Accessed November 2020.
[177] E-Vargabe, website available at: https://www.evergabe-online.de/start.html;jsessionid=3031C80986F9683AB7A0DD75E9410F8B.node051?0

Figure 18. EPS fish-boxes in use in fish market

A.6 Iceland *(population 357,000)*

The headquarters of Protection of the Arctic Marine Environment[178] (PAME) is based in Iceland. This is a Working Group of the Arctic Council[179] and among its projects, is one to develop a Regional Action Plan on Marine Litter which involves several Arctic Council partners and OSPAR. In its Desktop study on Marine Litter[180], which was published in 2019, there was no reference to EPS or XPS.

In its initial commitment[181] to the UN Oceans Conference, Iceland undertook to reduce marine litter in its waters in the next three years, and to increase recycling and appropriate treatment of single-use plastics. Its progress report was due in May 2018 but this does not appear to have been submitted.

[178] Protection of the Arctic Marine Environment (PAME), website available at: https://www.pame.is/
[179] Arctic Council, website available at: https://arctic-council.org/en/
[180] Desktop Study on Marine Litter including micro-plastics in the Arctic, published by PAME and the Arctic Council June 2019, available at: https://www.pame.is/document-library/desktop-study-on-marine-litter-library Accessed November 2020.
[181] 'Iceland commits to reduce marine litter in its waters', Ocean Action 16721, published by the UN, details available at: https://oceanconference.un.org/commitments/?id=16721#:~:text=Iceland%20commits%20to%20reduce%20marine%20litter%20in%20its%20waters%20over,items%20and%20used%20fishing%20gear. Accessed November 2020.

The Icelandic waste prevention programme[182], "United against waste – general policy on waste prevention 2016-2027" does not contain any references to EPS or XPS. However it contains a plan to "reduce the use of disposable food containers".

The Icelandic Government has passed[183] an amendment to an existing Act which will lead to a ban on the sale of a number of single-use plastic items, including "food containers, beverage containers, glasses and cups made of foam plastic" from July 2021. This generic reference to foam plastic could be taken to mean containers made from EPS and XPS but neither material is explicitly included in the text.

It should be noted that most domestically-produced EPS in Iceland is exported; EPS fish-boxes form the majority of packaging on the fish Iceland exports to many parts of the globe. Most of the imported EPS takes the form of clean EPS packaging on electrical items but this is likely to be too small in volume to warrant collection and recycling (see also OceanWise WP 5.5 report).

Public sector procurement is carried out using an e-tendering system, called Ríkiskaup[184], which operates in a similar way to those in EU Member States. No reference to EPS or XPS could be found in a search of the database of tenders.

A.7 Ireland *(EU Member State – population 4.9 million)*

In the 2017 IUCN marine plastics litter policies review[185], the authors noted Ireland's implementation of the OSPAR RAP on Marine Litter and its involvement in the Fishing for Litter Scheme. Since then Bord Iascaigh Mhara (BIM), the Irish seafood development agency, has been working with the seafood industry, to support to the Clean Oceans Initiative[186]; it does this by ensuring the minimisation of waste impacts and developing mitigation efforts.

In its assessment[187] of Irish waste prevention policies, last updated in 2016, the EEA noted the development of a packaging waste prevention programme.

There is one packaging compliance scheme in operation, Repak[188]. Since it developed its Plastic Pledge in 2018, which is aimed at delivering the objectives of Repak's Plastics Packaging Recycling Strategy, 115 of Ireland's packaging producers have committed to delivering changes. In its 2019 report[189], Musgrave, a significant wholesaler and retailer, committed to eliminating EPS packaging

[182] 'United against waste – general policy on waste prevention, 2016-2027', published by the Icelandic Government, available at: https://www.stjornarradid.is/media/umhverfisraduneyti-media/media/pdf_skrar/saman-gegn-soun-2016_2027.pdf Accessed November 2020.
[183] 'Common disposable plastic products will be banned next year', published by the Ministry of the Environment and Natural Resources, 01 July 2020, details available at: https://www.stjornarradid.is/efst-a-baugi/frettir/stok-frett/2020/07/01/Algengar-einnota-vorur-ur-plasti-verda-oheimilar-a-naesta-ari/ Accessed April 2021.
[184] Ríkiskaup e-tendering system, website available at: https://www.rikiskaup.is/is
[185] 'National marine plastic litter policies in EU member states: an overview', published by IUCN November 2017, available at: https://portals.iucn.org/library/sites/library/files/documents/2017-052.pdf Accessed November 2020.
[186] Clean Oceans Initiative, published by BIM, available at: https://bim.ie/aquaculture/sustainability-and-certification/clean-oceans-initiative/
[187] Country Fact Sheets, EEA evaluations of waste prevention programmes, Ireland November 2016 available at: https://www.eea.europa.eu/themes/waste/waste-prevention/countries Accessed November 2020.
[188] Repak, website available at: https://www.repak.ie/
[189] Repak Members' Plastic Pledge Report 2019, published by Repak 2020, available at: https://repak.ie/images/uploads/reports/Repak_Members_Plastic_Pledge_Report_2019.pdf Accessed November 2020.

from its own-brand range and in-store. Separately it was reported[190] that Aldi (Ireland) would eliminate a number of items, including EPS trays, from its own-product range by the end of 2020.

There is another industry-led initiative, the Plastics Action Alliance[191], in which a number of food producers are involved. However, they do not reference EPS or XPS in their mission statement or their targets for plastics packaging reduction.

As an EU Member State, Ireland is due to transpose the SUP Directive by July 2021. In 2019, the Government Department for Housing, Local Government and Heritage (the Department), commissioned, on behalf of OSPAR, an assessment of instruments relating to single-use plastics. The content of the final report[192] is examined in detail elsewhere in this report.

In advance of the introduction of the SUP Directive legislation, the Irish Government took the step of banning the purchase[193] of single-use plastic items by individual government departments in 2019, a ban which includes certain EPS and XPS products. Single-use plastic plates, cutlery, cups and straws were included in the list of items which was not material specific. For certain health and safety reasons, such items can still be purchased. To date it appears that some departments have switched to compostable items although the Department of the Environment, Climate and Communications encourages a move to reusable products.

Ireland has also established environmental targets for marine litter following on from the EU Commission Decision[194] relating to the standards for good environmental status. In the publication[195] "Article 17 update to Ireland's Marine Strategy Part 1…" published in June 2020, one of these, D10T1b, is to eliminate beach litter caused by the items which are listed under Article Five of the SUP Directive, including "expandable polystyrene fast food containers and expandable polystyrene beverage containers and cups" by the end of 2024.

The Health Service Executive (HSE), which is responsible for running the public health system across the country, including hospitals, published a guide[196] for the removal of certain single-use plastic

[190] 'Aldi bans plastic trays packaging for fruit and vegetable range', by Kevin O'Sullivan, published by the Irish Times 19 August 2019, available at: https://www.irishtimes.com/news/environment/aldi-bans-plastic-trays-packaging-for-fruit-and-vegetables-range-1.3991206 Accessed October 2020.

[191] Plastics Action Alliance, website available at: https://www.plasticsactionalliance.com/

[192] 'A study to identify and assess relevant instruments and incentives to reduce the use of single-use and other items, which impact the marine environment as marine litter', by Optimize & eftec, published by the Department of Housing, Local Government & Heritage January 2018, available at: https://www.housing.gov.ie/sites/default/files/publications/files/single_use_marine_litter_report_final.pdf Accessed November 2020.

[193] Published on gov.ie 22 July 2020, available at: https://www.gov.ie/en/publication/60a0a-sd-test-climate-action-waste/

[194] Commission Decision (EU) 2017/848 of 17 May 2017 laying down criteria and methodological standards on good environmental status of Marine waters and specifications and standardised methods for monitoring and assessment, and repealing Decision 2010/477/EU, available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32017D0848

[195] Marine Strategy Framework Directive 2008/56/EC - Article 17 update to Ireland's Marine Strategy Part 1: Assessment (Article 8), Determination of Good Environment Status (Article 9) and Environmental Targets (Article 10), June 2020, published by the Department of Housing, Planning and Local Government, available at: http://www.housing.old.gov.ie/sites/default/files/publications/files/2020_june_article_17_update_to_irelands_marine_strategy_part_1_articles_8_9_10_final.pdf

[196] Guide for the removal of single use cups, cutlery and straws for the Health Service Executive (HSE) and organisations funded by the HSE, published by the HSE, August 2019, available at: https://www.hse.ie/eng/about/who/healthbusinessservices/national-health-sustainability-office/files/guide-for-the-removal-of-single-use-catering-plastics.pdf

items in 2019. As it recommends the switch from plastic cups and crockery to reusable items where feasible, or compostable products where single-use is required, the use of products made from EPS and XPS is restricted.

There is also an Office of Government Procurement (OGP)[197] which establishes many frameworks for the provision of goods and services from which public sector agencies draw down their requirements. An OGP call for tenders[198] to establish a framework for consumables in 2020 advised prospective tenderers that they needed to "address the implications of the Single Use Plastics Directive and the provision of alternatives to those Goods identified under Article 5".

As an EU Member State, all public sector procurement is carried out via a tendering system, eTenders[199]. When the Department tendered for the marine litter survey for 2021[200], it specified a number of items to be recorded in greater detail which included EPS and XPS food containers, EPS and XPS beverage cups and foamed polystyrene packaging and fragments.

The national Green Schools and Clean Coasts programmes focus on increasing awareness among children and adults alike about the risks posed by plastics in the marine environment and the changes that individuals can make to reduce the amount of litter, plastic and otherwise, generated.

Ireland is a country where (pre-Covid) office workers queue daily to buy lunch in a shop or delicatessen close to their offices. The range of hot food available to take-away is very broad and the use of XPS-clamshell containers is ubiquitous. The use of EPS in takeaway food service containers is less marked and EPS cups are rarely used, albeit it is believed that they may be used in hospital and prison settings. As there is no EPR scheme in place for EPS and XPS food containers, it's likely that most if not all these containers end up as general waste and therefore landfilled or incinerated, or worst case scenario, as marine litter.

In a note[201] prepared for the Oireachtas (Irish parliament) in July 2020, the author notes the various policy responses to the issue of single-use plastics but points to the necessity of a change in consumer behaviour as a major driver in reducing the waste caused by these items.

[197] Office of Government Procurement, website at: https://ogp.gov.ie/
[198] Single Supplier Framework Contract for the Supply of Disposable Catering Consumables and Meal Containers, published by Office of Government Procurement, December 2020, details available at: https://irl.eu-supply.com/ctm/Supplier/PublicPurchase/178872/0/0?returnUrl=ctm/Supplier/PublicTenders&b=ETENDERS_SIMPLE
[199] eTenders, website available at: https://www.etenders.gov.ie/
[200] Marine Litter Survey 2021 – Invitation to tender for the Undertaking of a Marine Litter survey 2021, published on eTenders, 26 November 2020, available at: https://irl.eu-supply.com/ctm/Supplier/PublicPurchase/178914/0/0?returnUrl=ctm/Supplier/PublicTenders&b=ETENDERS_SIMPLE
[201] Oireachtas Library & Research Service, 2020, L&RS Note: Single use plastics – what's the problem and what are we doing about it, available at: https://data.oireachtas.ie/ie/oireachtas/libraryResearch/2020/2020-06-26_l-rs-note-single-use-plastics-what-s-the-problem-and-what-are-we-doing-about-it_en.pdf Accessed November 2020.

Figure 19. EPS collection point in Irish civic amenity site

A.8 Luxembourg *(EU Member State – population 614,000)*

In its assessment[202] of waste prevention policies in Luxembourg, last updated in 2019, the EEA noted that the country is taking steps to promote reusable tableware at events and to reduce the volume of single-use cups, both of which could lead to a reduction in the demand for EPS and XPS food service and beverage containers.

There is one packaging compliance scheme in place, called ValorLux[203]. Neither EPS nor XPS are listed in the items that are acceptable in either of the recycling bags that are available to households.

The Ville de Luxembourg operates a Recycling Centre. Its website states that "preformed polystyrene components and chips (Styropor®)" are allowed when construction waste is being brought to a Recycling Centre.

[202] Country Fact Sheets, EEA evaluations of waste prevention programmes, Luxembourg October 2019 available at: https://www.eea.europa.eu/themes/waste/waste-prevention/countries Accessed November 2020.
[203] ValorLux, website available at: https://www.valorlux.lu/en

As an EU Member State, Luxembourg will be obliged to transpose the SUP Directive by July 2021.

As an EU Member State, all public sector procurement is carried out via a tendering system, PMP[204]. All references to EPS and XPS found in the tenders related to building work contracts, where it appears their use relates to insulation and other construction purposes.

A.9 Netherlands *(EU Member State – population 17.3 million)*

In the 2017 IUCN marine plastics litter policies review[205], the authors noted that the Netherlands is leading the development of several OSPAR measures, including the Fishing for Litter agreements, has a Framework Agreement in place to reduce and recycle packaging and highlights the importance of communicating with consumers and bringing about consumer behavioural change.

There are no specific actions noted by the EEA in its assessment[206] of waste prevention policies in the Netherlands, last updated in 2016, that relate to marine litter or single-use plastics.

As an EU Member State, the Netherlands provided an update[207] to the EU as part of its overall submission to the G20 Osaka Blue Vision. In it, the Netherlands advised of its continuing collaboration with other OSPAR partners and noted that there has been a significant decrease in the overall volume of items of litter found on Dutch beaches.

There are two packaging compliance schemes in place, Afvalfonds Verpakkingen[208] for businesses, and Nedvang for consumers. On the website of the latter is a Product Specification[209] for Expanded Polystyrene; this details the requirements for the management of waste EPS but there appears to be no other details about the recycling of EPS. There is no reference to XPS on either website.

A voluntary agreement, the Dutch Plastics Pact, was launched[210] in 2019 whose 75 signatories include the country's environment ministry, companies and environmental organisations. Its ultimate objective is for less plastic to enter the marine environment, and it will achieve this by reducing plastic consumption, increasing the rate of plastic waste recycling and ensuring that new plastic products are completely recyclable.

As an EU Member State the Netherlands will be obliged to transpose the SUP Directive by July 2021. The Ministry of Infrastructure and Water Management is a signatory[211] , on behalf of the Dutch Government, to the European Plastics Pact.

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[204] Portail des Marchés Publics, website available at: https://pmp.b2g.etat.lu/?page=entreprise.EntrepriseHome
[205] 'National marine plastic litter policies in EU member states: an overview', published by IUCN November 2017, available at: https://portals.iucn.org/library/sites/library/files/documents/2017-052.pdf Accessed November 2020.
[206] Country Fact Sheets, EEA evaluations of waste prevention programmes, Netherlands October 2016 available at: https://www.eea.europa.eu/themes/waste/waste-prevention/countries Accessed November 2020.
[207] 'Towards Osaka Blue Ocean Vision', Netherlands update to the EU, 02 April 2020, available at: https://g20mpl.org/partners/netherlands Accessed November 2020.
[208] Afvalfonds Verpakkingen, website available at: https://afvalfondsverpakkingen.nl/en/
[209] Product Specification 04/2009 Fraction-No. 340, available at: https://www.nedvang.nl/wp-content/uploads/2019/03/EPS-DKR-340.pdf Accessed November 2020.
[210] 'Plastics Pact NL 2019-2025', published 2019, available at: https://www.circulairondernemen.nl/uploads/0e657a0084a4f18d2ff61335794ea3c7.pdf Accessed November 2020.
[211] Signatories to the European Plastics Pact, available at: https://europeanplasticspact.org/signatories/ Accessed November 2020.

An NGO, Plastic Soup[212], which is based in NL, focuses its efforts on plastic marine litter, among other areas. While neither EPS nor XPS are specifically referenced, Styrofoam™ is mentioned in a post[213] about the marine litter and pollution caused by the loss of large number of containers from a ship which was sailing in Dutch waters in early 2019. The article goes on to state that polystyrene, which is then also referred to (erroneously) as Styrofoam, which is used for packaging, will be found on beaches along the Wadden Sea for many years to come and calls for the NL government to make the case for a complete ban on Styrofoam for packaging.

The Polystyrene Loop project[214] is based in the Netherland; the project's main objective is to safely recycle waste EPS from construction and demolition, which contains the flame retardant HBCD. See OceanWise WP 5.5 report for more details about this EU-supported project.

As an EU Member State, all public sector procurement is carried out via a tendering system, TenderNed[215]. No reference to EPS or XPS could be found in a search of the database of tenders.

A.10 Norway *(population 5.3 million)*

In its Marine Strategy document[216], the Norwegian government acknowledges the issues and causes of marine plastic litter and commits to reducing the volume of same. Many Norwegian harbours and ports participate in the Fishing for Litter Scheme.

There are no specific actions noted by the EEA in its assessment[217] of waste prevention policies in Norway, last updated in 2016, that relate to marine litter or single-use plastics.

Following the adoption of the SUP Directive in 2018, the Norwegian Environment Agency commissioned a report[218] on single-use plastics, which was completed in April 2019. The report identifies two main options for the Norwegian government: a switch to single-use non plastic items or a switch to multi-use items. In two separate data-sets for items found on beaches in Norway, EPS was among the top ten. Fast-food EPS packaging was one of 19 single-use plastic items examined for the report.

The report includes EPS fast-food packaging in its list of materials which are not suitable for material recycling in Norway. The report asserts that a switch away from EPS for the use of fast food packaging, plates, trays and beverage cups, is possible due to wide variety of alternative materials

[212] Plastic Soup, website available at: https://www.plasticsoupfoundation.org/en/
[213] 'Lessons from the container spill disaster in the Wadden Sea', published 07 January 2019, available at: https://www.plasticsoupfoundation.org/en/2019/01/lessons-from-the-container-spill-disaster-in-the-wadden-sea/ Accessed November 2020.
[214] PolyStyreneLoop project, website at: https://polystyreneloop.eu/
[215] TenderNed, website available at: https://www.tenderned.nl/cms/
[216] 'New Growth, Proud History – the Norwegian Government's Ocean Strategy', published by the Norwegian Ministry of Trade, Industry and fisheries, available at: https://www.regjeringen.no/contentassets/00f5d674cb684873844bf3c0b19e0511/the-norwegian-governments-ocean-strategy---new-growth-proud-history.pdf Accessed November 2020.
[217] Country Fact Sheets, EEA evaluations of waste prevention programmes, Norway October 2016, available at: https://www.eea.europa.eu/themes/waste/waste-prevention/countries Accessed November 2020.
[218] 'Reduced Littering of Single-Use Plastics – Mapping and Analysis of Potential Measures to Reduce the Littering of Certain Single-Use Plastic Products', by Eunomia and Mepex, published by the Norwegian Environment Agency, April 2019, available at: https://holdnorgerent.no/wp-content/uploads/2019/06/2019_04_SUP_Final_report.pdf Accessed November 2020.

and an analysis of likely final recycling rates (estimates) is that fast-food packaging EPS has a 0% recycle rate, whereas if switched to an alternative, multi-use material, the recycle rate would be 38%. It is interesting to note that of the litter generated which enters the sea, the proportion of fast-food packaging EPS is estimated at 0.14%. However, Norway's beaches are not subject to the same volume of day-trippers and tourists as those countries with beaches situated in hotter climes.

In terms of costs, a move away from EPS would see reductions in waste generated, water usage, GHG emissions and total consumer costs, but an increase in total services costs. These outcomes are predicted under both scenarios but are more pronounced where there is a switch to multi-use products. The report notes that a mix of policies is likely to be required in order to transition away from single-use plastics. There are no references to XPS in the report.

It was reported[219] in 2020 that the government was planning to bring in a single-use plastics ban ahead of the implementation date for the EU's SUP Directive; however no evidence of such legislation could be found.

In terms of a packaging compliance scheme, Norway has one in place for commercial operations, Grønt Punkt Norge[220], which uses the Green Dot system. Their website has a number of references to EPS and to Styrofoam™ albeit erroneously and there is an active EPS collection system for industrial users. More details about the EPS recycling capacity can be found in the Norway Country Fact Sheet in OceanWise WP 5.5 Report.

Public sector procurement is carried out using an e-tendering system, called Doffin[221], which operates in a similar way to those in EU Member States. There is a reference to XPS in the context of a tender for the refurbishment of a sports facility, with insulation boards made from extruded polystyrene specified in the tender documents.

A.11 Portugal *(EU Member State – population 10.3 million)*

In the 2017 IUCN marine plastics litter policies review[222], the authors noted the Portuguese involvement with OSPAR regional activities and its support of the development of technological platforms that reduce marine pollution.

There are no specific actions noted by the EEA in its assessment[223] of waste prevention policies in Portugal, last updated in 2016, that relate to marine litter or single-use plastics.

In its transposition of the EU Port Reception Facilities Directive[224] the Portuguese government has included a requirement that port authorities provide facilities for the disposal of waste EPS and XPS

[219] 2020 New Regulation: Norway to ban single-use plastic, by Ka Man Mak, published by Ogoori 19 September 2020 (?), details available at: https://www.ogoori.eco/post/2020-new-regulation-norway-to-ban-single-use-plastic Accessed November 2020.
[220] Grønt Punkt Norge, website available at: https://www.grontpunkt.no/english/
[221] Doffin e-tendering system, website available at: https://www.doffin.no/en
[222] 'National marine plastic litter policies in EU member states: an overview', published by IUCN November 2017, available at: https://portals.iucn.org/library/sites/library/files/documents/2017-052.pdf Accessed November 2020.
[223] Country Fact Sheets, EEA evaluations of waste prevention programmes, Portugal October 2016, available at: https://www.eea.europa.eu/themes/waste/waste-prevention/countries Accessed November 2020.
[224] Directive (EU) 2019/883 of the European Parliament and of the Council, 17 April 2019, available at: https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX%3A32019L0883

from all ships entering the country's ports. While many harbour authorities already offer these facilities, it will become mandatory under the new legislation. It is intended that any waste EPS and XPS material collected in this manner will be sent for recycling, potentially for use in construction.

Portugal has several packaging compliance schemes in operation but none specifically for EPS or XPS. One EPS producer established[225] a separate company in December 2019 to collect and recycle EPS, mainly EPS fish-boxes, which are generated by the fish-farming industry across Portugal.

There is a Portuguese Pact for Plastics[226] in place with more than 50 signatories from many industrial sectors, academic institutions and NGOs; however no specific details about what the pact entails are available.

It was reported[227] in July 2019 that the Portuguese government planned to introduce legislation that would ban the use of a number of items, including the "disposable trays usually wrapped in plastic or expanded polystyrene" used for bread, fruit and vegetables. At that stage, the Bill had yet to be passed by the Committee of the Environment[228]. It has since been reported[229] that the proposed ban will not now go ahead until a date to be decided in 2021, possibly because of the effects of Covid-19 on businesses in general. As an EU Member State Portugal will be obliged to transpose the SUP Directive by July 2021. The Ministry of Environment and Climate Action is a signatory[230], on behalf of the Portuguese Government, to the European Plastics Pact.

There is an NGO, APLM[231], operating in Portugal whose focus is to provide training and education to raise awareness about the impacts of marine litter.

As an EU Member State, all public sector procurement is carried out via a tendering system, BASE[232]. Most of the references to EPS related to the use of EPS in construction although one contract referred to "the acquisition of expanded polystyrene blocks for packing pallets inside refrigerated containers". No reference to XPS was found.

[225] 'BEWiSynbra establishes a recycling company in Portugal', published by BEWiSynbra December 2019, available at: https://news.cision.com/bewisynbra-group-ab--publ-/r/bewisynbra-establishes-a-recycling-company-in-portugal,c2991753 Accessed November 2020.
[226] Pacto Portugués Para os Plásticos, Smart Waste Portugal website, available at: http://www.smartwasteportugal.com/pt/atividades/pacto-portugues-para-os-plasticos/o-que-e/
[227] 'Portugal plastic ban from 2020', published by the Portugal News 26 July 2019, details available at: https://www.theportugalnews.com/news/portugal-plastic-ban-from-2020/50499 Accessed November 2020.
[228] 'Portugal passes new law to stop using plastic', published by Power of Positivity (no date), details available at: https://www.powerofpositivity.com/portugal-law-stop-using-plastic/ Accessed November 2020.
[229] 'Postponing end of single-use plastic "bad news"', published by the Portugal News 04 September 2020, details available at: https://www.theportugalnews.com/news/postponing-end-of-single-use-plastic-bad-news/55593 Accessed November 2020.
[230] Signatories to the European Plastics Pact, available at: https://europeanplasticspact.org/signatories/ Accessed November 2020.
[231] APLM, website available at: https://en.aplixomarinho.org/
[232] BASE Contratos Públicos Online, website available at: http://www.base.gov.pt/Base/en/Portal/Base

The Azores

The Azores, an archipelago of islands in the Atlantic Ocean, is an autonomous region of Portugal. It was announced[233] that a pilot scheme coordinated by Waste Free Oceans, which commenced in 2018, would continue into 2019 and broaden its scope. Its broad objective is to "significantly contribute to the prevention and clearance of plastics pollution in the Atlantic Ocean". There is no reference to EPS or XPS.

A.12 Spain *(EU Member State – population 47 million)*

In the 2017 IUCN marine plastics litter policies review[234], the authors noted that there were several targets relating to marine litter in the Spanish Programme of Measures (PoM) under the EU MSFD.

In its assessment[235] of Spanish waste prevention policies, last updated in 2016, the EEA noted the intent to "promote the reduction of single-use packaging in the catering and hotel sector".

Spain is a permanent guest invitee to the G20 and as such, provided an update[236] to the G20 Osaka Blue Vision. In it Spain advised of its intent to roll out a national "fishing for Litter" plan and its promotion of projects and initiatives, including the "analysis of the possibility of recycling specific fishing materials as EPS boxes…"

The LIFE EPS-Sure Project[237] is based in Madrid. More details about this pilot project, which is testing the feasibility of recycling used EPS fish-boxes into food-grade polystyrene, can be found in the OceanWise WP 5.5 report.

There is one packaging compliance scheme in place, Ecoembes; no reference to EPS or XPS could be found.

It was announced[238] in June 2020 that the Spanish government, in tandem with the implementation date for the SUP Directive, plans to roll out a new indirect tax on non-reusable plastic packaging. Manufacturers (with some exemptions) will be faced with a levy of €0.45 per kilogram for such packaging placed on the market in Spain. It has been estimated that the tax could raise as much as €724mn annually. It appears that the tax will apply to both food and non-food plastic packaging.

[233] 'Azores initiative targets ocean waste', by Len Port, published by the Algarve Daily News (no date), available at: https://algarvedailynews.com/nautical/15819-azores-initiative-targets-ocean-waste Accessed November 2020.

[234] 'National marine plastic litter policies in EU member states: an overview', published by IUCN November 2017, available at: https://portals.iucn.org/library/sites/library/files/documents/2017-052.pdf Accessed November 2020.
[235] Country Fact Sheets, EEA evaluations of waste prevention programmes, Spain October 2016, available at: https://www.eea.europa.eu/themes/waste/waste-prevention/countries Accessed November 2020.
[236] 'Towards Osaka Blue Ocean Vision', Spanish update, available at: https://g20mpl.org/partners/spain
[237] Life SURE_EPS Project, website available at: http://www.life-eps-sure.com/the-project/
[238] 'Spain published proposal for indirect tax on non-reusable plastic packagin1, published by EY 10 June 2020, details available at: https://taxnews.ey.com/news/2020-1528-spain-publishes-proposal-for-indirect-tax-on-non-reusable-plastic-packaging?uAlertID=Sd%2FG8rua1oj6%2Fl58EZ2AiA%3D%3D Accessed November 2020.

The Ministry of Ecological Transition and Demographic Challenge is a signatory[239], on behalf of the Spanish Government, to the European Plastics Pact.

As an EU Member State, all public sector procurement is carried out via a tendering system, Contratacion[240]. There are numerous references to EPS and XPS on tender documents, all of which seem to relate to construction-related projects. It indicates that the use of both EPS and XPS products for building is widespread throughout Spain.

The Balearic Islands

The Balearic Islands, which include Mallorca, Menorca and Ibiza, make up an autonomous Spanish community. From January 2021 the sale of a number of single-use plastics will be banned[241], including "coated disposable trays, plates and cups" which could refer to items made from XPS and EPS.

Figure 20. EPS single-use cups

[239] Signatories to the European Plastics Pact, available at: https://europeanplasticspact.org/signatories/ Accessed November 2020.
[240] Contratacion, website available at: https://contrataciondelestado.es/wps/portal/plataforma
[241] 'Balearic Islands' law for waste and polluted lands', published by Global SCP Projects Database (no date), available at: https://www.oneplanetnetwork.org/initiative/balearic-islands-law-waste-and-polluted-lands Accessed November 2020.

A.13 Sweden *(EU Member State – population 10.2 million)*

In the 2017 IUCN marine plastics litter policies review[242], the authors noted the involvement by Sweden in both the OSPAR and HELCOM Marine Litter Action Plans.

In its assessment[243] of Swedish waste prevention policies, last updated in 2019, the EEA noted the International Coastal Cleanup days which take place annually to help clean up marine litter.

There is one packaging compliance scheme in place, Förpacknings & Tidnings Insamlingen[244]. While there are no references to EPS or XPS, Styrofoam™ is mentioned in a way which would indicate that the material referenced is actually XPS. In its instructions for households, it states "Styrofoam trays for meat and fish should therefore be placed in the plastic packaging receptacle", although it is not clear if this is then included for recycling or waste treatment.

BEWiSynbra, which has its headquarters in Sweden, is a leading manufacturer and supplier of EPS and EPS products. The company announced[245] in October 2019 that it had successfully produced 100% recycled EPS and would commence trials with customers soon thereafter.

Another Swedish company, Storaenso, has developed an alternative to EPS fish-boxes[246] which is a lined, fibre-based product.

As an EU Member State, Sweden will be obliged to transpose the SUP Directive by July 2021. The Government of Sweden is a signatory[247] to the European Plastics Pact.

As an EU Member State, all public sector procurement is carried out via a tendering system, the National Agency for Public Procurement[248]. No reference to EPS or XPS could be found in a search of the database of tenders.

A.14 Switzerland *(population 8.5 million)*

As Switzerland is not an EU Member State it is not required to transpose the SUP Directive; the country's government indicated[249] in 2018 that it does not intend to introduce a national ban and favours an industry-led approach to resolving the problem of plastic litter.

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[242] 'National marine plastic litter policies in EU member states: an overview', published by IUCN November 2017, available at: https://portals.iucn.org/library/sites/library/files/documents/2017-052.pdf Accessed November 2020.
[243] Country Fact Sheets, EEA evaluations of waste prevention programmes, Sweden July 2019 available at: https://www.eea.europa.eu/themes/waste/waste-prevention/countries Accessed November 2020.
[244] Förpacknings & Tidnings Insamlingen, website available at: https://www.ftiab.se/
[245] 'The world's first 100% recycled EPS', published by BEWiSynbra 28 October 2019, available at: https://bewisynbra.com/raw/the-worlds-first-100-recycled-eps/ Accessed November 2020.
[246] Storaenso, website available at: https://www.storaenso.com/en/products/corrugated-packaging-solutions/ecofishbox?cc-option-checkbox=Essential
[247] Signatories to the European Plastics Pact, available at: https://europeanplasticspact.org/signatories/ Accessed November 2020.
[248] The National Agency for Public Procurement, website available at: https://www.upphandlingsmyndigheten.se/en
[249] 'Switzerland has no intention of banning single-use plastics', published by Swiss Info 05 June 2018, available at: https://www.swissinfo.ch/eng/eu-regulations_switzerland-has-no-intention-of-banning-single-use-plastics-/44167748 Accessed November 2020.

Geneva has taken the lead at city level and from 01 January 2020, the sale of a number of single-use plastic items was prohibited[250], although the ban does not extend to products made from EPS or XPS. At least one organisation which is headquartered in Geneva has also taken action; the IUCN has banned[251] the use of several single-use plastic items, including EPS cups, at its offices since the end of 2019.

reCIRCLE[252] is a scheme in place nationwide which is aimed specifically at office workers who buy their lunch out. It is effectively a deposit-return scheme; consumers purchase a re-usable container which can then be used at any of the network members who number more than 1,300 food-service takeaway providers across Switzerland. Consumers return the used container each time they purchase food from any network member and receive their takeaway items in a fresh container.

There is no packaging compliance scheme in place; instead a number of ordinances[253] at regional level determine the targeted recycling rates. There are several voluntary systems in operation to collect materials such as PET and glass.

SVI, the Swiss Packaging institute[254], does not reference any specific packaging materials.

Public sector procurement is carried out via a tendering system, Simap[255]. No reference to EPS or XPS could be found in a search of the database of tenders.

A.15 United Kingdom *(population 66.65 million)*

In the 2017 IUCN marine plastics litter policies review[256], the authors noted that there were marine litter strategies for both Northern Ireland and Scotland, marine litter was included in the National Litter Strategy for England and the involvement by the UK in the OSPAR Regional Action Plan.

In its assessment[257] of waste prevention policies in England, Wales, Northern Ireland and Scotland, last updated in 2019, the EEA noted no references to actions relating specifically to marine litter or marine plastic pollution.

As a member of the G20 group of nations, the UK is a partner to the Implementation Framework for Actions on Marine Litter and its corresponding Osaka Blue Vision. In its most recent update[258] to the

[250] 'New fines for single use plastic in Geneva', published by Le News 27 December 2019, available at: https://lenews.ch/2019/12/27/fines-for-single-use-plastic-in-geneva/ Accessed November 2020.
[251] 'Reducing single-use plastics at the IUCN Conservation Centre, published by IUCN 19 December 2019, available at: https://www.iucn.org/news/marine-and-polar/201912/reducing-single-use-plastics-iucn-conservation-centre Accessed November 2020.
[252] reCircle, website available at: https://www.recircle.ch/en
[253] Packaging waste, Federal Office for the Environment, website available at: https://www.bafu.admin.ch/bafu/en/home/topics/waste/guide-to-waste-a-z/packages.html
[254] SVI, Swiss Packaging Institute, website available at: https://www.svi-verpackung.ch/de/
[255] Simap, website available at: https://www.simap.ch/shabforms/COMMON/application/applicationGrid.jsp?template=1&view=1&page=/MULTILANGUAGE/simap/content/start.jsp&language=EN
[256] 'National marine plastic litter policies in EU member states: an overview', published by IUCN November 2017, available at: https://portals.iucn.org/library/sites/library/files/documents/2017-052.pdf Accessed November 2020.
[257] Country Fact Sheets, EEA evaluations of waste prevention programmes, UK July 2019, available at: https://www.eea.europa.eu/themes/waste/waste-prevention/countries Accessed November 2020.
[258] UK update, G20 Towards Osaka Blue Ocean Vision, posted 02 April 2020, available at: https://g20mpl.org/partners/unitedkingdom Accessed November 2020.

G20, the UK advised of its work on marine plastic pollution through its involvement on programmes with the International Maritime Organisation (IMO), the British-Irish Council, the Commonwealth Blue Charter and the Commonwealth Clean Ocean Alliance.

The use of EPS has been the subject of intense debate and discussion in recent years, particularly in the hospitality sector.

In the Sustainable Restaurant Association publication 'Unwrapping plastic'[259] dated June 2018, it mentions expanded polystyrene as one of the materials used in disposable coffee cups and takeaway packaging; in both cases it notes that it is economically impossible to recycle and therefore both items made from EPS should be avoided. There is no reference to XPS in the document.

The hospitality industry association, UK Hospitality, in Issue Six[260] of its publication 'Future Shock' recognises that consumers are no longer satisfied with general sustainability commitment but instead are seeking industries action on more specific areas, including packaging. Interestingly, the report refers to a survey that noted that consumers with more disposable income were the ones most concerned about sustainability issues and willing to pay more for items that are more "environmentally friendly". In the same report one of the case studies is about Sodexo[261], a company that provides catering operations across a number of different sectors. The Head of Waste Management for the UK & Ireland is quoted as saying that, as polystyrene products are difficult to recycle, Sodexo is in the process of phasing them out, but the piece does not stipulate whether he's referring to EPS and/or XPS products.

WRAP[262], the UK-based organisation that works with governments, businesses and communities on resource efficiency included polystyrene in the "Eight to Go" list, of plastic items that needed to be eliminated in its first UK Plastics Pact Report and it's referenced in a similar manner in Version Three of the report[263] which was published in December 2019. It refers to the polystyrene that is used in yogurt pots (PS) and takeaway containers (both EPS and XPS can be used) and as these post-consumer items are not being recycled due to contamination by food, it determined that they needed to be phased out. The Pact acknowledged that some companies offer a take-back service for EPS packaging on household goods (Currys PC World[264] being one good example) so its focus is on the EPS that comes on smaller goods potentially and takeaway food containers, which could end up in consumer and outdoor waste receptacles.

[259] 'Unwrapping Plastic: Understanding disposables in hospitality', published by the Sustainable Restaurant Association, June 2018. Available on request. Website: https://thesra.org/ Accessed October 2020.
[260] 'Future Shock – Issue Six Sustainability', published by UK Hospitality, available at: https://www.ukhospitality.org.uk/page/FutureShock-IssueSix Accessed October 2020.
[261] Sodexo, details available at: https://uk.sodexo.com/home.html Accessed October 2020.
[262] WRAP, details available at: https://www.wrap.org.uk/
[263] 'Eliminating Problem Plastics' Version 3, December 2019. Available at: https://wrap.org.uk/sites/files/wrap/Eliminating-problem-plastics-v3.pdf Accessed October 2020.
[264] Curry PC World Eps Take-back, per the EPS Group of the British Plastics Federation, available at: http://www.eps.co.uk/recycling/currys_pc_world.html Accessed October 2020.

WRAP's Plastics Pact Report 2018/2019[265] changes the reference to polystyrene in the eight to be eliminated to "Household polystyrene packaging". While EPS is not referenced specifically, it is likely that it is the material being targeted.

WRAP currently has 85 Business Members which collectively, account for more than 60% of consumer plastic packaging in the UK. WRAP has a Product Design Review[266] on its website which suggests that the EPS used in the delivery of such an appliance could be replaced by reusable Expanded Polypropylene.

In an effort to drive better consumer awareness of the recyclability of EPS and XPS containers and test the feasibility of collecting and recycling food-contaminated EPS and XPS takeaway containers, RECOUP[267] (RECycling of Used Plastics Ltd) piloted a 'Pledge2Recycle' event at the Swansea Air Show in 2018, where consumers were asked to drop their used takeaway food containers into specific bins. The items were tested and analysed for their suitability for recycling but a high degree of contamination meant that the waste system piloted was not rolled out elsewhere. (See also OceanWise WP 5.5 report).

The Food Service Packaging Association represents companies in the entire supply chain of packaging for food. A paper[268] prepared for the Association by Green Alliance, which reviewed the strategies and commitments of some retailers on packaging, only mentions EPS once. It references a retailer which took four years to replace an EPS base used for its pizzas with a cardboard alternative.

From a slide presentation available on the Association's website[269] one of the speakers, representing Pack2Go which is the European Convenience Food Packaging association, discussed the introduction of the SUP Directive. He stated that the implementation of the EPR rules as outlined in the Directive could vary significantly between Member States, despite the 'guidelines and criteria from Brussels'. The speaker also notes that legal advice is being sought (though he does not reference by whom) on whether or not the legislation can be challenged. What is interesting is that for an organisation which represents a number of businesses whose use of EPS and XPS is likely to be quite significant, there appears to be no policy in place to encourage the improved collection of the used items for compacting and/or recycling.

A.15.1 Regulatory actions

As the UK is no longer a member of the EU, it will not be obliged to transpose the SUP Directive. However, a ban on a range of single-use plastic items came into effect on 01 October 2020, the date for implementation having been pushed back from 01 April 2020, due to the effects that the Covid-19 pandemic was having on businesses.

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[265] WRAP 'The UK Plastics Pact Report 2018/2019', published December 2019, available at: https://www.wrap.org.uk/sites/files/wrap/The-UK-Plastics-Pact-report-18-19.pdf Accessed October 2020.
[266] WRAP 'Product Design Review – Side by Side Fridge Freezer', available at: https://www.wrap.org.uk/sites/files/wrap/WRAP%20Design%20Review%20Case%20Study%20Side%20by%20Side%20Fridge%20Freezer.pdf
[267] RECOUP Recycling Ltd, Peterborough, UK, details available at: https://www.recoup.org/ Accessed October 2020.
[268] 'Plastic Promises: what the grocery sector is really doing about packaging', published by the Food Service Packaging Society March 2020, available at: http://foodservicepackaging.org.uk/resources/ Click on Plastic Promises. Accessed October 2020.
[269] 'Environment Seminar', Food Service Packaging Society, available at: http://foodservicepackaging.org.uk/resources/. Click on FPA Seminar Presentation. Accessed October 2020.

Prior to the legislation being published Defra commissioned a study of the effects of a ban on EPS food service products. 'A Preliminary Assessment of the Economic Impacts of a Potential Ban on EPS Food and Beverage Containers – Final Report' was published[270] in October 2019. The findings of this report are covered in more detail in the Findings section.

Defra also carried out an Impact Assessment[271] on its proposed reform of the packaging producer responsibility system in the UK. In the document, EPS is referred to just once, in a list of polymers that are deemed "not economically recyclable", on which it states there is broad industry consensus.

The inclusion of a specific material type was described at the time as 'unfair' by the Executive Director of the Foodservice Packaging Association (FPA) who noted[272] that alternatives may be more expensive and less effective. The ban[273] has since been implemented but EPS products now appear to have been left out, with plastic straws and stirrers and plastic-stemmed cotton buds listed as the items prohibited per the UK Government press release.

A.15.2 Voluntary actions

One of the main suppliers of salmon to the retailer Marks & Spencer (M&S) has been working on an alternative to the EPS fish-boxes it had been using to send its fish to the retailer. In 2017, it began to use a different delivery system of bulk boxes and by 2019 the company estimated[274] it had displaced the use of 780,000 EPS fish-boxes.

At one hospital foundation in Newcastle, the Sustainability Officer pushed for the replacement of a number of single-use items such as polypropylene bowls and plastic cutlery with proper delph and cutlery that could be washed and re-used. As a result the Foundation stated[275] it has saved the use of more than 300,000 polystyrene bowls. However, the Foundation's CEO included products made of EPS when he spoke about asking in-house caterers in the hospitals operating under the trust to stop purchasing and supplying certain single-use plastic products by April 2021.

Loughborough University in England is conspicuous for its management of waste EPS. As far back as 2014 it included clean EPS as suitable for collection and recycling on campus, and it also differentiated between EPS and Styrofoam™ on the Waste Guidance note[276] it has published on its website.

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[270] 'A Preliminary Assessment of the Economic Impacts of a Potential Ban on EPS Food and Beverage Containers – Final Report', prepared by Resource Futures, published by Defra October 2019, available at: http://sciencesearch.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=220&ProjectID=20292 Accessed November 2020

[271] 'Reforming the packaging producer responsibility system in the United Kingdom – Impact Assessment', published by Defra 14 February 2019, available at: https://consult.defra.gov.uk/environmental-quality/consultation-on-reforming-the-uk-packaging-produce/supporting_documents/packagingeprconsultimpactassessment.pdf Accessed October 2020.

[272] 'Government looks closely at EPS ban', published by Footprint 06 June 2019, available at: https://www.foodservicefootprint.com/government-looks-closely-at-eps-ban%EF%BB%BF/ Accessed November 2020.

[273] Gov.uk press release published 01 October 2020, available at: https://www.gov.uk/government/news/start-of-ban-on-plastic-straws-stirrers-and-cotton-buds Accessed October 2020.

[274] 'It's a wrap for farmer's plastic packaging', published by Fish Farmer 20 June 2019, available at: https://www.fishfarmermagazine.com/news/its-a-wrap-for-farmers-plastic-packaging/ Accessed November 2020.

[275] 'The hospital that's sick of single-use plastic', published by Footprint 10 August 2020, available at: https://www.foodservicefootprint.com/the-hospital-thats-sick-of-single-use-plastic/ Accessed October 2020.

[276] 'Waste Guidance Note: WGN010', Loughborough University, available at: https://www.lboro.ac.uk/media/wwwlboroacuk/content/sustainability/downloads/guidancenotes/wgn010_polystyrene.pdf Accessed October 2020

A UK-based company, Woolcool[277], has developed an alternative to EPS packaging for both food and pharmaceutical uses.

Public sector procurement for the UK is carried out via a tendering system. One reference to XPS was found which was in a tender for building works in 2015. The only reference to EPS was in the tender document requesting quotes for the supply of the Impact Assessment Report, referenced above.

A.15.3 Northern Ireland

A paper[278] written for the Northern Ireland Assembly on plastic waste in the marine environment noted ongoing developments across the UK and quotes from a marine litter survey carried out in 2017 which found that "plastic and polystyrene pieces (of unknown origin)" were among the most commonly recorded items found for every 100 metres of beach surveyed. It also noted the UK's record of sending plastic waste to countries with poor records of waste management.

Public sector procurement is carried out via a tendering system, eTenders NI[279]. No reference to EPS or XPS could be found in a search of the database of tenders.

A.15.4 Scotland

The Scottish Government has an Expert Panel on Environmental Charging and Other Measures (EPECOM). The panel submitted a report[280] on the use of single-use disposable beverage cups in 2019 and one of its recommendations is a ban on cups made from EPS. There was no reference to XPS in the review.

In October 2020, the Scottish Government published a number of consultation papers[281], inviting submissions from a broad range of stakeholders, to its proposal to legislate in 2021 for a ban of certain single-use products. The Government is proposing to use the terminology found within the text of the EU's SUP Directive, so they include single-use food containers, cups and other beverage containers made from EPS in the list of items to be restricted/banned. It would appear that the government is using the definition of XPS as per the Resource Futures publication, in that they define XPS as a subset of EPS and therefore included in the list of items to be restricted/banned. The submission closing date for all papers was January 2021.

Public sector procurement is carried out via a tendering system, Public Contracts Scotland[282]. Any references to EPS found were in relation to construction contracts. No references to XPS were found.

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[277] Woolcool, the Packaging Company, website at: https://www.woolcool.com/the-packaging-company/

[278] 'Plastic Waste in the Marine Environment, by Katie Threadgill, Research and Information Service Research Paper, published by the Northern Ireland Assembly, 10 June 2019, available at: http://www.niassembly.gov.uk/globalassets/documents/raise/publications/2017-2022/2019/environment/0219.pdf

[279] eTenders NI, website at: https://etendersni.gov.uk/epps/home.do

[280] 'Report of the Expert Panel on Environmental Charging and Other Measures: Recommendation on Single-Use Disposable Beverage Cups', published by the Scottish Government, July 2019, available at: https://www.gov.scot/publications/report-expert-panel-environmental-charging-measures-epecom-recommendations-single-use-disposable-beverage-cups-july-2019/ Accessed November 2020.

[281] 'Consultation: Introducing market restrictions on single-use plastic items in Scotland, published by the Scottish Government, 12 October 2020, available at: https://consult.gov.scot/zero-waste-delivery/introducing-market-restrictions-on-single-use-plas/

[282] Public Contracts Scotland, website at: https://www.publiccontractsscotland.gov.uk/Default.aspx

A.15.5 Wales

The Welsh Government commissioned a report to examine the effects of the introduction of a ban or restrictions on single use plastics. "Preliminary Research to Assess the Impacts of a Ban or Restrictions in Sale in Wales of Items in the EU's Single Use Plastics Directive"[283] was published in May 2020. It is reviewed in full in the Findings section of the report.

Public sector procurement is carried out via a tendering system, Sell2Wales[284]. No reference to EPS or XPS could be found in a search of the database of tenders.

A.16 European Union *(OSPAR Contracting Party)*

As a member of the G20 group of nations, the EU is a partner to the Implementation Framework for Actions on Marine Litter and its corresponding Osaka Blue Vision. In its most recent update[285] to the G20 in March 2020, the EU references its Strategy for Plastics in a Circular Economy, the Single Use Plastics, Marine Strategy Framework and Port Reception Facilities Directives and its ongoing revision of waste legislation.

It was reported[286] in July 2020 that the European Council is discussing the possible introduction of a levy at EU level, on "non-recycled plastic packaging waste" which could become part of national taxation schemes.

Actions in terms of policies and Directives at EU level are covered elsewhere in the report.

[283] 'Preliminary Research to Assess the Impacts of a Ban or Restrictions in Sale in Wales of Items in the EU's Single Use Plastics Directive', by Cole G., Worth C., Powell K., Reeve S., Stevenson S., Morgan N., Walker H., (2019), published by the Welsh Government, available at: https://gov.wales/impacts-ban-or-restrictions-sale-items-eus-single-use-plastics-directive

[284] Sell2Wales, website available at: https://www.sell2wales.gov.wales/Default.aspx

[285] EU update, G20 Towards Osaka Blue Ocean Vision, posted 02 April 2020, available at: https://g20mpl.org/partners/europeanunion Accessed November 2020.

[286] 'Fiscal Measures related to Packaging Materials and Applications', published by Food Drink Europe 15 July 2020, available at: https://www.fooddrinkeurope.eu/news/statement/fiscal-measures-related-to-packaging-materials-and-applications/ Accessed October 2020.

Figure 21. Map of Europe

APPENDIX B – REST OF EU

B.1 Austria *(population 8.8 million)*

In the 2017 IUCN marine plastics litter policies review[287], the authors noted that Austria has a number of programmes in place to protect and improve the quality of some of the rivers that run through the country, including a "Zero (Plastic) Pellet Loss" initiative specifically geared for the Danube River.

In the EEA's assessment[288] of Austrian waste prevention policies, last updated in 2019, there is no reference to marine or river-based plastic litter.

There is one packaging compliance scheme in place, called ARA[289]. There are some references to EPS in documents on the website. One paper[290] quotes a study which estimated that EPS made up approximately 2% of the Austrian packaging market in 2018. It is not clear if EPS is collected and treated separately, either at an industrial level or from households.

There is a comprehensive guide[291] by ARA on circular packaging design; the only references to EPS are in relation to the "SUP" Directive and the relatively small market share EPS has of packaging overall. It contains no reference to XPS.

The Austrian packaging institute, Packforce Austria[292], has no references to EPS or XPS.

The SUP Directive is due to be transposed and become Austrian law on or before 03 July 2020. While the Austrian government implemented a ban[293] on plastic bags with effect from 01 January 2020, there appears to be no additional restriction on items made from EPS and/or XPS in advance of the implementation of the EU Directive at national level.

As an EU Member State, all public sector procurement is carried out via a tendering system, DORDA[294]. No reference to EPS or XPS could be found in a search of the database of tenders.

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[287] 'National marine plastic litter policies in EU member states: an overview', published by IUCN November 2017, available at: https://portals.iucn.org/library/sites/library/files/documents/2017-052.pdf Accessed November 2020.
[288] Country Fact Sheets, EEA evaluations of waste prevention programmes, Austria July 2019 available at: https://www.eea.europa.eu/themes/waste/waste-prevention/countries Accessed November 2020.
[289] ARA, details available at: https://www.ara.at/
[290] 'Circular Packaging Design Guideline', by FH Campus Vien, Packforce Austria, Circular Analytics, Version 2 published July 2019. Available at: https://www.ara.at/fileadmin/user_upload/Downloads/EU_Kreislaufwirtschaftspaket/Kunststoffbroschuere/Circular-Packaging-Design-Guideline_FH-Campus-Wien_V02.pdf Accessed November 2020.
[291] 'Circular Plastics 2030: Rethinking Resources and the Circular Economy. A Call to Action.' Published by Altstoff Recycling Austria, available at: https://www.ara.at/fileadmin/user_upload/Downloads/Kunststoffbroschuere/ARA_Kunststoffbroschuere_Englisch.pdf Accessed November 2020.
[292] Packforce Austria, website available at: https://packforceaustria.at/
[293] 'Ban on plastic bags in Austria: What has changed?', published by Deutsche Recycling, available at: https://deutsche-recycling.de/en/blog/ban-on-plastic-bags-in-austria-what-has-changed/ Accessed November 2020.
[294] DORDA, details available at: https://www.dorda.at/

B.2 Bulgaria *(population 7 million)*

In the 2017 IUCN marine plastics litter policies review[295], the authors noted that Bulgaria has a number of marine litter measures in place under its MSFD programme.

In the EEA's assessment[296] of Bulgarian waste prevention policies, last updated in 2016, there is no reference to marine or river-based plastic litter.

There appears to be five packaging compliance schemes[297] in operation to which producers can subscribe in order to meet their obligations. There is no separate collection system for EPS or XPS.

There is a large EPS cup manufacturer based in Sofia, Solvita[298], which is potentially exporting to other EU countries. It's worth noting that the "What to do with plastic waste" link, on the company's website, is to the video produced by the EPS Alliance in the USA which describes how EPS can be recycled.

A company based in Bulgaria has developed a biodegradable alternative to EPS. Biomyc[299] produces a mushroom-based product which it says is designed as "an alternative to Styrofoam packaging".

As an EU Member State, the SUP Directive is due to be transposed by July 2021. There is no indication of any moves to ban or restrict EPS or XPS in advance of the SUP Directive.

As an EU Member State, all public sector procurement is carried out via a tendering system[300], Public Procurement Portal. No references to EPS or XPS could be found.

B.3 Croatia *(population 4 million)*

In the 2017 IUCN marine plastics litter policies review[301], the authors noted that Croatia had defined marine litter as a special waste stream category in its Act on sustainable Waste Management and there was an obligation to prepare "a Rule book of marine litter management".

In the EEA's assessment[302] of Croatian waste prevention policies, last updated in 2019, there were no references to marine plastic litter or the waste management of marine litter.

There is one packaging compliance scheme, Eko Ozra[303], which uses the Green Dot system. There is no reference to EPS or XPS, nor any evidence of a separate collection system.

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[295] 'National marine plastic litter policies in EU member states: an overview', published by IUCN November 2017, available at: https://portals.iucn.org/library/sites/library/files/documents/2017-052.pdf Accessed November 2020.
[296] Country Fact Sheets, EEA evaluations of waste prevention programmes, Bulgaria July 2016 available at: https://www.eea.europa.eu/themes/waste/waste-prevention/countries Accessed November 2020.
[297] Bulgaria – Legal Background, published by Interseroh, available at: https://www.interseroh.eu/check-the-pack/en/bulgaria/
[298] Solvita, website available at: https://solvita-bg.eu/en/
[299] Biomyc, website available at: https://biomyc.eu/
[300] Public Procurement Portal, website available at: https://www2.aop.bg/en/home
[301] 'National marine plastic litter policies in EU member states: an overview', published by IUCN November 2017, available at: https://portals.iucn.org/library/sites/library/files/documents/2017-052.pdf Accessed November 2020.
[302] Country Fact Sheets, EEA evaluations of waste prevention programmes, Croatia July 2019 available at: https://www.eea.europa.eu/themes/waste/waste-prevention/countries Accessed November 2020.
[303] Eko Ozra, website available at: https://www.eko-ozra.hr/hr/

As an EU Member State, the SUP Directive is due to be transposed by July 2021. There is no indication of any moves to ban or restrict EPS or XPS in advance of the SUP Directive.

As an EU Member State, all public sector procurement is carried out via a tendering system[304], Portal of Public Procurement. No references to EPS or XPS could be found.

B.4 Cyprus *(population 880,000)*

In the 2017 IUCN marine plastics litter policies review305, the authors noted that, under its PoM under the MSFD, the country has a National Action Plan on marine litter in place.

In the EEA's assessment306 of Cypriot waste prevention policies, last updated in 2019, there were no references to marine plastic litter or the waste management of marine litter.

There is one packaging compliance scheme in place, green-dot Cyprus[307]. There are no references to EPS or XPS, nor a collection system for either material.

As an EU Member State, the SUP Directive is due to be transposed by July 2021. There is no indication of any moves to ban or restrict EPS or XPS in advance of the SUP Directive.

As an EU Member State, all public sector procurement is carried out via a tendering system[308], e-Procurement. No reference to EPS or XPS could be found in a search of the database.

B.5 Czech Republic *(population 10.65 million)*

In the 2017 IUCN marine plastics litter policies review309, the authors noted no specific marine litter measures in place.

There is no reference to marine litter or plastic pollution measures in the EEA's assessment[310] of Czech waste prevention policies, last updated in 2019.

There is one packaging compliance scheme in place, EKO-KOM[311] which uses the Green Dot system. There is no reference to EPS or XPs and there does not appear to be any separate collection for either of these materials.

The packaging institute, syba[312], contains no references to EPS or XPS.

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[304] Portal of Public Procurement, website available at: http://www.javnanabava.hr/default.aspx?id=7229
[305] 'National marine plastic litter policies in EU member states: an overview', published by IUCN November 2017, available at: https://portals.iucn.org/library/sites/library/files/documents/2017-052.pdf Accessed November 2020.
[306] Country Fact Sheets, EEA evaluations of waste prevention programmes, Cyprus October 2019 available at: https://www.eea.europa.eu/themes/waste/waste-prevention/countries Accessed November 2020.
[307] Green-dot Cyprus, website available at: http://greendot.com.cy/en/node/413
[308] e-Procurement, website available at: http://www.treasury.gov.cy/treasury/treasurynew.nsf/page21_en/page21_en?opendocument
[309] 'National marine plastic litter policies in EU member states: an overview', published by IUCN November 2017, available at: https://portals.iucn.org/library/sites/library/files/documents/2017-052.pdf Accessed November 2020.
[310] Country Fact Sheets, EEA evaluations of waste prevention programmes, Czechia July 2019 available at: https://www.eea.europa.eu/themes/waste/waste-prevention/countries Accessed November 2020.
[311] EKO-KOM, website available at: https://www.ekokom.cz/en
[312] Syba, website available at: https://syba.cz/about-syba

The Council of Prague took the step[313], with effect from the summer of 2019, of banning all single-use plastics from outdoor events to which the city provides financial support. The ban extends to cups and food trays, which would by its nature, include EPS and XPS containers and cups, although there is no specific reference to any material. The same article also states that the operators of the farmers' markets in Prague have committed to only serving food and drink in biodegradable containers, which again would exclude the use of products made EPS and XPS.

As an EU Member State, the SUP Directive is due to be transposed by July 2021.

As an EU Member State, all public sector procurement is carried out via a tendering system[314], Portál o veřejnŷch zakázkách. No references to EPS or XPS could be found.

B.6 Estonia *(population 1.3 million)*

In the 2017 IUCN marine plastics litter policies review315, the authors noted under its PoM under the MSFD, Estonia was due to develop an action plan for managing marine litter specifically in harbours.

In the EEA's assessment[316] of Estonian waste prevention policies, last updated in 2016, the authors noted no marine litter or plastic pollution measures.

There are two packaging compliance schemes in place, ETO[317] which uses the Green Dot system and Eesti Pandipakend[318] which operates a Deposit-Return system for bottles. There is no reference to EPS or XPS on either website and no indication of a collection system in place for either material.

The City of Tallinn[319] introduced a ban, with effect from 01 October 2019, on single-use plastics for serving food and drinks at public events. The definition used would include EPS and XPS products, and the purpose of the ban was three-fold:

1. to reduce the amount of plastic waste generated at such events;
2. to increase consumers' awareness of waste; and
3. to encourage the use of reusable dishes.

As an EU Member State, the SUP Directive is due to be transposed by July 2021.

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313 'Prague introduces new ban on plastics at city-sponsored events', by Molly Hookings, published by Event Industry News, 08 May 2019, details available at: https://www.eventindustrynews.com/news/prague-introduces-new-ban-on-plastics-at-city-sponsored-events Accessed October 2020.

314 Portál o veřejnŷch zakázkách, website available at: https://portal-vz.cz/uvod/

315 'National marine plastic litter policies in EU member states: an overview', published by IUCN November 2017, available at: https://portals.iucn.org/library/sites/library/files/documents/2017-052.pdf Accessed November 2020.

316 Country Fact Sheets, EEA evaluations of waste prevention programmes, Czechia July 2019 available at: https://www.eea.europa.eu/themes/waste/waste-prevention/countries Accessed November 2020.

317 ETO, website available at: https://www.eto.ee/en/

318 Eesti Pandipakend, website available at: https://eestipandipakend.ee/en/

319 'Tallinn to ban single-use plastic dishes, utensils at public events', published by EER News, 22 March 2019, details available at: https://news.err.ee/922752/tallinn-to-ban-single-use-plastic-dishes-utensils-at-public-events Accessed November 2020.

As an EU Member State, all public sector procurement is carried out via a tendering system[320] Riigihangete Register. No references to EPS or XPS could be found.

B.7 Greece *(population 10.7 million)*

In the 2017 IUCN marine plastics litter policies review321, the authors note measures undertaken to address marine plastic litter under Greece's MFSD programme and its participation in the Barcelona Convention for the Protection of the Mediterranean Sea against Pollution.

In the EEA's assessment[322] of Greek waste prevention policies, last updated in 2016, the authors noted no marine litter or plastic pollution measures.

There is one packaging compliance scheme in place, the Hellenic Recovery Recycling Corporation[323], which uses the Green Dot system. There is no reference to EPS or XPS, nor any evidence of a separate collection system.

The Greek packaging institute, AGMPM[324], does not have any references to EPS or XPS on its website.

As an EU Member State, the SUP Directive is due to be transposed by July 2021.

As an EU Member State, all public sector procurement is carried out via a tendering system, NEPPS (ΕΣΗΔΗΣ)[325] . No references to EPS or XPS could be found.

B.8 Hungary *(population 9.7 million)*

In the 2017 IUCN marine plastics litter policies review326, the authors noted that as a landlocked country, Hungary contributes to marine litter pollution measures through its international river basin cooperation.

There was no reference to any measures undertaken to prevent river-based marine litter in the EEA's assessment[327] of Hungarian waste prevention policies, last updated in 2016.

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[320] Riigihangete Register, website available at: https://riigihanked.riik.ee/rhr-web/#/
[321] 'National marine plastic litter policies in EU member states: an overview', published by IUCN November 2017, available at: https://portals.iucn.org/library/sites/library/files/documents/2017-052.pdf Accessed November 2020.
[322] Country Fact Sheets, EEA evaluations of waste prevention programmes, Greece July 2016 available at: https://www.eea.europa.eu/themes/waste/waste-prevention/countries Accessed November 2020.
[323] Hellenic Recovery Recycling Corporation, website available at: https://www.herrco.gr/
[324] Association of Greek Manufacturers of Packaging and Materials, website available at: https://www.pac.gr/index.php
[325] National Electronic Public Procurement System (ΕΣΗΔΗΣ), website available at: http://www.eprocurement.gov.gr/webcenter/faces/oracle/webcenter/page/scopedMD/sd0cb90ef_26cf_4703_99d5_1561ceff660f/Page119.jspx?_afrLoop=7254511825705413#%40%3F_afrLoop%3D7254511825705413%26_adf.ctrl-state%3D155wzocofl_53
[326] 'National marine plastic litter policies in EU member states: an overview', published by IUCN November 2017, available at: https://portals.iucn.org/library/sites/library/files/documents/2017-052.pdf Accessed November 2020.
[327] Country Fact Sheets, EEA evaluations of waste prevention programmes, Hungary July 2016 available at: https://www.eea.europa.eu/themes/waste/waste-prevention/countries Accessed November 2020.

There is one packaging compliance scheme in place, OKO Pannon[328] which uses the Green Dot system. There is no search function on the website and no reference to EPS or XPS could be found.

There is a Hungarian packaging institute, CSAOSZ[329]; there is no search function on the website and no reference to EPS or XPS could be found.

As an EU Member State, the SUP Directive is due to be transposed by Hungary no later than July 2021.

It was reported[330] in May 2020 that Hungary intended to implement some of the restrictions under the Directive earlier than required. The draft legislation included the restriction on placing EPS products on the market, with effect from 01 January 2021; however, the draft legislation was later withdrawn[331]. It was subsequently announced[332] that the legislation, containing the SUP measures, would be brought before parliament in line with the July 2021 deadline.

As an EU Member State, all public sector procurement is carried out via a tendering system, Közbeszerzési Hatóság[333]. References to EPS and XPS appear in building works tenders, and seem to relate to use in construction and insulation.

B.9 Italy *(population 60 million)*

In the 2017 IUCN marine plastics litter policies review334, the authors noted that Italy has a suite of measures and programmes under the auspices of its MSFD membership that specifically target marine litter and planned to design and create a type of fishing for litter programme.

There are no specific references to marine litter or marine plastic pollution in the EEA's assessment[335] of Italian waste prevention policies, last updated in 2016.

As a member of the G20 group of nations, Italy is a partner to the Implementation Framework for Actions on Marine Litter and its corresponding Osaka Blue Ocean Vision. In its most recent update[336] to the G20, Italy advised of its work on marine plastic pollution through its programmes under the Barcelona Convention and the MSFD and its schemes, Salvamare (focusing on fishing for litter) and

[328] OKO Pannon, website available at: http://www.okopannon.hu/
[329] Hungarian Association of Packaging and Materials Handling, website available at: http://en.csaosz.hu/
[330] 'Hungarian decree on restriction of placing on market certain single-use plastic products', published by CHeMyCAI news, 28 May 2020, details available at: https://chemycal.com/news/c4647491-19ec-4138-81a0-36bb30d8dac2/Hungarian_decree_on_restriction_of_placing_on_market_of_certain_single-use_plastic_products Accessed November 2020.
[331] 'Ban on disposable plastic: Government withdraws bill after 6 days', by Fanni Kaszás, published by Hungary Today, 20 May 2020, details available at: https://hungarytoday.hu/ban-on-disposable-plastic-govt-withdraws-bill-after-6-days/ Accessed November 2020.
[332] 'Hungary to ban single-use plastics from 01 July 2021', published by the Visegrad Group, 28 May 2020, details available at: http://www.visegradgroup.eu/news/hungary-to-ban-single Accessed November 2020.
[333] Közbeszerzési Hatóság, website available at: https://www.kozbeszerzes.hu/english/
[334] 'National marine plastic litter policies in EU member states: an overview', published by IUCN November 2017, available at: https://portals.iucn.org/library/sites/library/files/documents/2017-052.pdf Accessed November 2020.
[335] Country Fact Sheets, EEA evaluations of waste prevention programmes, Italy October 2016 available at: https://www.eea.europa.eu/themes/waste/waste-prevention/countries Accessed November 2020.
[336] Italy update, G20 Towards Osaka Blue Ocean Vision, posted 02 April 2020, available at: https://g20mpl.org/partners/italy Accessed November 2020.

Plastic Free Challenge (a voluntary initiative to get public and private offices to reduce the use of single-use plastics).

The Italian packaging institute[337] contains no references to EPS or XPS, despite Italy having the largest EPS manufacturing industry in the EU.

There is one packaging compliance scheme in place for businesses, Conai[338], (which does not reference EPS or XPS) and one for domestic households, Corepla[339]. Corepla supports[340] specific infrastructure which is in place for the collection of EPS waste throughout most of Italy. The collection/drop-off points appear to be available for both domestic and some industrial users.

There is a packaging EPR Scheme in place, which to date has been managed by Assobioplastiche[341], which is for compostable and biodegradable packaging only. It was announced[342] in June 2020 that a new consortium, Biorepack , would take on the responsibility of managing the EPR Scheme.

Possibly because of the early adoption of bioplastics and the existence of a recycling infrastructure, sales of packaging products made from compostable materials are on the increase[343].

As an EU Member State, the SUP Directive is due to be transposed by Italy by July 2021 and there is no indication of any moves to ban or restrict EPS or XPS in advance of the SUP Directive deadline. The implementation of the Directive's requirements could prove challenging as the use of EPS food packaging is widespread in Italy, from fish-boxes to vegetables to ice-cream for takeaway.

As an EU Member State, all public sector procurement is carried out via a tendering system, acquistinretepa[344]. All references to EPS and XPS were found in building works tenders and related to their use in insulation and construction.

[337] Instituto Italiano Imballaggio, website available at: https://istitutoimballaggio.org/
[338] Conai, website available at: https://www.conai.org/en/
[339] Corepla, website available at: https://www.corepla.it/
[340] Trade and Industry Platforms – PIFU and PEPS, published by Corepla, details available at: https://www.corepla.it/piattaforme-commercio-e-industria-pifu-e-peps
[341] Assobioplastiche, website available at: http://www.assobioplastiche.org/
[342] 'Biorepack, the new consortium for the collection of bioplastics', published by Ecomavi, 19 June 2020, details available at: https://www.ecomavi.it/2020/06/19/biorepack-the-consortium-for-the-collection-of-bioplastics/?lang=en Accessed December 2020.
[343] 'Compostable materials market booms in Italy', by Liz Gyekye. published by Bio Market Insights, 19 June 2020, details available at: https://biomarketinsights.com/compostable-materials-market-booms-in-italy/ Accessed December 2020.
[344] Acquistinretepa, website available at: https://www.acquistinretepa.it/opencms/opencms/

Figure 22. EPS containers for takeaway use in an ice-cream shop in Padua, Italy

B.10 Latvia *(population 1.9 million)*

In the 2017 IUCN marine plastics litter policies review345, the authors note that marine litter data is included in the criteria for the Blue Flag programme.

In the EEA's assessment[346] of Latvian waste prevention policies, last updated in 2016, there was no reference to any specific marine litter policies or programmes.

There appears to be a voluntary packaging compliance scheme in place, eco baltia[347], which uses the Green Dot system. Latvia also has an all-inclusive natural resource tax, which includes a packaging tax[348], and there are Producer Responsibility Organisations in place. There is no evidence that there is any collection, of either domestic or industrial EPS or XPS.

The Latvian packaging institute[349] contains no references to EPS or XPS.

As an EU Member State, the SUP Directive is due to be transposed by Latvia no later than July 2021. There is no evidence of any moves to ban or restrict EPS or XPS in advance of the SUP Directive.

As an EU Member State, all public sector procurement is carried out via a tendering system, Iepirkumu uzraudzibas birojs[350]. All references to EPS and XPS were on building contracts tenders only, in relation to their use as insulation materials but not the management of any waste.

[345] 'National marine plastic litter policies in EU member states: an overview', published by IUCN November 2017, available at: https://portals.iucn.org/library/sites/library/files/documents/2017-052.pdf Accessed November 2020.
[346] Country Fact Sheets, EEA evaluations of waste prevention programmes, Cyprus October 2019 available at: https://www.eea.europa.eu/themes/waste/waste-prevention/countries Accessed November 2020.
[347] eco baltia, website available at: https://www.ecobaltia.lv/en/home/
[348] 'Packaging tax in Latvia', by Janis Brizga, published by the Institute for European Environmental Policy, December 2016, details available at: https://ieep.eu/uploads/articles/attachments/2295371a-be98-4ab0-92be-9cd755a148e4/LV%20Packaging%20Tax%20final.pdf?v=63680923242 Accessed November 2020.
[349] Latvijas Iepakojuma Asociácija, website available at: http://www.packaging.lv/
[350] Lepirkumu uzraudzibas birojs, website available at: https://info.iub.gov.lv/lv/meklet

B.11 Lithuania *(population 2.8 million)*

In the 2017 IUCN marine plastics litter policies review351, the authors noted there are programmes in place under the MSFD covering marine litter and plans to monitor marine litter, with a particular focus on the Lithuanian part of the Baltic Sea.

There are no specific references to marine litter or marine plastic pollution in the EEA's assessment[352] of Lithuanian waste prevention policies, last updated in 2016.

While there may be more than one packaging compliance scheme in operation, reference could only be found for one PRO, Žaliasis Taŝkas[353], which uses the Green Dot system. There is no indication of any collection system for EPS or XPS.

The Lithuanian Packaging Association[354] makes no reference to EPS or XPS.

As an EU Member State, the SUP Directive is due to be transposed by Lithuania no later than July 2021. There is no indication of any moves to ban or restrict the sale of EPS or XPS products in advance of SUP Directive at a national level. However, some localised actions have been undertaken.

The City Council of Vilnius announced[355] in March 2020 that single-use plastic utensils and plates would no longer be available at events in the capital. While the definition is vague, it would cover plates made from EPS and XPS.

Iki, a large supermarket retail chain stated[356] its intention, in August 2019, to phase out a number of single-use plastic products, including plates and cups. Again, while neither EPS nor XPS is specifically referred to, it is likely that they would have been covered under such a plan.

As an EU Member State, all public sector procurement is carried out via a tendering system, CVPP[357]. No references to EPS or XPS could be found.

B.12 Malta *(population 500,000)*

In the 2017 IUCN marine plastics litter policies review[358], the authors noted that there are a suite of measures in place to address marine litter under the Programme for the MSFD.

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351 'National marine plastic litter policies in EU member states: an overview', published by IUCN November 2017, available at: https://portals.iucn.org/library/sites/library/files/documents/2017-052.pdf Accessed November 2020.
352 Country Fact Sheets, EEA evaluations of waste prevention programmes, Lithuania October 2016 available at: https://www.eea.europa.eu/themes/waste/waste-prevention/countries Accessed November 2020.
353 Žaliasis Taŝkas, website available at: http://www.zaliasistaskas.lt/index.html
354 Lietuvos Pakuotojų, website available at: http://www.packing.lt/index.html
355 'Vilnius bans disposable plastic utensils at city events', by Plamen Petrov, published by The Mayor.eu, 28 January 2020, details available at: https://www.themayor.eu/en/vilnius-bans-disposable-plastic-utensils-at-city-events Accessed November 2020.
356 'Lithuania's largest retail chain set to eliminate single-use plastics from its stores', published by Delfi.en, 08 August 2019, details available at: https://en.delfi.lt/business/lithuanias-largest-retail-chain-set-to-eliminate-single-use-plastics-from-its-stores.d?id=81941231 Accessed November 2020.
357 CVPP, website available at: https://cvpp.eviesiejipirkimai.lt/
358 'National marine plastic litter policies in EU member states: an overview', published by IUCN November 2017, available at: https://portals.iucn.org/library/sites/library/files/documents/2017-052.pdf Accessed November 2020.

In the EEA's assessment[359] of Maltese waste prevention policies, last updated in 2019, there are no references to any marine litter or plastic pollution policies.

There appears to be just one packaging compliance scheme in place, GreenPack[360], which uses the Green Dot system. There is no separate collection system in place for EPS or XPS.

As an EU Member State, the SUP Directive is due to be transposed by Malta no later than July 2021. However, the draft text that was submitted[361] to the EU indicated the intention of Malta to introduce parts of the Directive with effect from January 2021. The draft text includes the prohibition of the importation of a number of single-use plastic items, including:

"(g) Food containers made of expanded polystyrene, i.e. receptacles such as boxes, with or without a cover, used to contain food which:

- is intended for immediate consumption, either on-the-spot or take-away,
- is typically consumed from the receptacle, and
- is ready to be consumed without any further preparation, such as cooking, boiling or heating,

including food containers used for fast food or other meal ready for immediate consumption, except beverage containers, plates and packets and wrappers containing food;

(h) Beverage containers made of expanded polystyrene, including their caps and lids;

(i) Cups for beverages made of expanded polystyrene, including their covers and lids."

As the text is taken directly from the Directive there is no reference to XPS or products made from XPS.

The ban on certain products took effect in January 2021 as planned and the list of items prohibited from importation[362] includes "Jablo" food containers and beverage cups. This appears to reference a specific brand of EPS products sold in Malta.

As an EU Member State, all public sector procurement is carried out via a tendering system, Department of Contracts[363]. Any reference to EPS and XPS are on the tender documents for building contracts only.

B.13 Poland *(population 38 million)*

In the 2017 IUCN marine plastics litter policies review[364], the authors noted it had some measures in place relating to marine litter under the MFSD.

[359] Country Fact Sheets, EEA evaluations of waste prevention programmes, Malta July 2019 available at: https://www.eea.europa.eu/themes/waste/waste-prevention/countries Accessed November 2020.
[360] Green Pack, website available at: https://www.greenpak.com.mt/packaging-recycling
[361] Notification Detail, 'Restrictions on Placing on the Market of Single-Use Plastic Products Regulations, 2020', published by the European Commission, 28 October 2020, details available at: https://ec.europa.eu/growth/tools-databases/tris/en/search/?trisaction=search.detail&year=2020&num=675
[362] 'Single-use plastics: what's banned and what's not?', by Kristina Abela, published by the Times Malta, 06 January 2021, details available at: https://timesofmalta.com/articles/view/thin-plastic-bags-wet-wipes-balloons-excluded-from-single-use-plastics.843066 Accessed April 2021.
[363] Department of Contracts, website available at: https://contracts.gov.mt/en/Pages/Home-DepartmentOfContracts.aspx
[364] 'National marine plastic litter policies in EU member states: an overview', published by IUCN November 2017, available at: https://portals.iucn.org/library/sites/library/files/documents/2017-052.pdf Accessed November 2020.

There are no specific references to marine litter or marine plastic pollution in the EEA's assessment[365] of Polish waste prevention policies, last updated in 2016.

Cobro[366], the Polish packaging institute, does not refer to any specific materials and no references to EPS or XPS could be found. There is also a Polish Chamber of Packaging, Polska Izba Opakań[367], but again, no references to EPS or XPS could be found

An Early Warning Report was issued[368] by the European Commission in 2018, noting that Poland was not on track to reach EU targets for recycling and landfill reduction by 2020. In its suggested Priority Actions, the report recommended that the EPR system in place for packaging waste be improved, in order to meet with minimum requirements under the revised Waste Framework Directive.

While there may be more than one packaging compliance scheme in operation, reference could only be found for one PRO, Rekopol[369], which operates the Green Dot system. There is no reference to EPS or XPS and there appears to be no separate collection system for either material.

As an EU Member State, the SUP Directive is due to be transposed by Poland no later than July 2021. There is no evidence of any moves to ban or restrict EPS or XPS in advance of the SUP Directive.

As an EU Member State, all public sector procurement is carried out via a tendering system, Urząd Zamónwień Publicznych[370]. All references to EPS and XPS are contained in tenders for building contracts.

B.14 Romania *(population 19.4 million)*

In the 2017 IUCN marine plastics litter policies review[371], the authors could not report on any marine litter policies as the PoM for the MSFD was still under development.

In the EEA's assessment[372] of Romanian waste prevention policies, last updated in 2019, there are no references to any marine litter or plastic pollution policies.

There appears to be just one packaging compliance scheme in place, EcoRom Ambalaje[373], which uses the Green Dot system. There is no reference to EPS or XPS and no separate collection system appears to be in place for either material.

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[365] Country Fact Sheets, EEA evaluations of waste prevention programmes, Poland October 2016 available at: https://www.eea.europa.eu/themes/waste/waste-prevention/countries Accessed November 2020.
[366] Cobro, website available at: http://www.cobro.org.pl/
[367] Polska Izba Opakań, website available at: http://pio.org.pl/index.php/pl/component/search/?searchword=ekstrudowany%20polistyren&searchphrase=all&Itemid=619
[368] Early Warning Report for Poland, published by the European Commission, 24 September 2018, details available at: https://ec.europa.eu/environment/waste/pdf/early_warning_report_PL.pdf
[369] Rekopol, website available at: https://www.rekopol.pl/
[370] Urząd Zamónwień Publicznych, website available at: https://www.uzp.gov.pl/
[371] 'National marine plastic litter policies in EU member states: an overview', published by IUCN November 2017, available at: https://portals.iucn.org/library/sites/library/files/documents/2017-052.pdf Accessed November 2020.
[372] Country Fact Sheets, EEA evaluations of waste prevention programmes, Romania July 2019 available at: https://www.eea.europa.eu/themes/waste/waste-prevention/countries Accessed November 2020.
[373] EcoRom Ambalaje, website available at: https://ecoromambalaje.ro/

As an EU Member State, the SUP Directive is due to be transposed by Romania no later than July 2021.It was reported[374] in 2019 that a draft bill to ban the use of certain plastic items at outdoor festivals was to be brought to parliament by the Environment Ministry. As one pillar of the proposed legislation was that food and drink could only be served in biodegradable or reusable "vessels or packages", this would have resulted in a ban on the use of food service products made from EPS and XPS. The bill however, does not appear to have become legislation.

As an EU Member State, all public sector procurement is carried out via a tendering system, Sistemul Electronic de Achizitii Publice[375]. No references to EPS or XPS could be found following a search of the database of tenders.

B.15 Slovakia *(population 5.4 million)*

In the 2017 IUCN marine plastics litter policies review[376], the authors noted there were no policies in place relating to marine litter but as it is a land-locked country, this would not be unusual.

In the EEA's assessment[377] of Slovakian waste prevention policies, last updated in 2019, it is noted that there is a goal to "limit the use of non-recyclable disposable packaging".

There are two packaging waste compliance schemes in place, Sewa[378] and Natur-Pack[379]. There are no references to EPS or XPS on either website and there appears to be no separate collection system in place for either material. Syba is the same packaging institute as in the Czech Republic.

As an EU Member State, the SUP Directive is due to be transposed by Slovakia no later than July 2021. There is no indication of any moves to ban or restrict EPS or XPS in advance of the SUP Directive.

As an EU Member State, all public sector procurement is carried out via a tendering system, Úrad pre Verejné Obstarávanie[380]. No references to EPS or XPS could be found in the database of published tenders.

[374] 'Draft bill to ban single-use plastics at Romanian festivals', by Éva Zay, published by Transylvania Now, 17 September 2019, details available at: https://transylvanianow.com/draft-bill-to-ban-single-use-plastics-at-romanian-festivals/ Accessed December 2020.
[375] Sistemul Electronic de Achizitii Publice, website available at: https://e-licitatie.ro/pub
[376] 'National marine plastic litter policies in EU member states: an overview', published by IUCN November 2017, available at: https://portals.iucn.org/library/sites/library/files/documents/2017-052.pdf Accessed November 2020.
[377] Country Fact Sheets, EEA evaluations of waste prevention programmes, Slovakia July 2019 available at: https://www.eea.europa.eu/themes/waste/waste-prevention/countries Accessed November 2020.
[378] Sewa, website available at: https://www.sewa.sk/en/compliance-scheme/
[379] Natur-Pack, website available at: https://www.naturpack.sk/en/
[380] Úrad pre Verejné Obstarávanie, website available at: https://www.uvo.gov.sk/

B.16 Slovenia *(population 2 million)*

In the 2017 IUCN marine plastics litter policies review[381], the authors noted marine litter measures under the MSFD and its marine environment management plan which includes targets on marine litter. There are no specific references to marine litter or marine plastic pollution in the EEA's assessment[382] of Slovenian waste prevention policies, last updated in 2019.
Slovenia has a high rate of waste plastic packaging recycling[383] in comparison to other EU member states, estimated to be around 60% (2017 figure).

In terms of packaging waste compliance schemes, there are several in place:

1) Surovina[384]
2) Slopak[385] (which operates the Green Dot system)
3) Interseroh[386]

There are no references to EPS or XPS on any of the websites for the organisations listed above and no evidence was found of a separate collection system.

A new draft Regulation on Packaging and Packaging Waste, published by Skupnost občin Slovenije[387] in June 2019, contains no references to EPS or XPS.

As an EU Member State, the SUP Directive is due to be transposed by Slovenia no later than July 2021. There is no indication that there are plans to ban or restrict EPS or XPS packaging in advance of the SUP Directive.

As an EU Member State, all public sector procurement is carried out via a tendering system, Elektronsko javno naročanje[388]. No references to EPS or XPS were found.

[381] 'National marine plastic litter policies in EU member states: an overview', published by IUCN November 2017, available at: https://portals.iucn.org/library/sites/library/files/documents/2017-052.pdf Accessed November 2020.
[382] Country Fact Sheets, EEA evaluations of waste prevention programmes, Slovenia July 2019 available at: https://www.eea.europa.eu/themes/waste/waste-prevention/countries Accessed November 2020.
[383] 'Slovenia far above EU average in processing of plastic packaging', published by the Government Communication Office, 05 November 2019, details available at: https://www.gov.si/en/news/2019-11-05-slovenia-far-above-eu-average-in-processing-of-plastic-packaging/ Accessed November 2020.
[384] Surovina, website available at: https://www.surovina.si/
[385] Slopak, website available at: https://www.slopak.si/
[386] Interseroh, website available at: https://www.interseroh.si/en/services/waste-management/common-waste-management-schemes/
[387] 'Draft Regulation on packaging and packaging waste', published by the Association of Municipalities and Towns of Slovenia, 07 June 2019, details available at: https://skupnostobcin.si/2019/06/osnutek-uredbe-o-embalazi-in-odpadni-embalazi/ Accessed November 2020.
[388] Elektronsko javno naročanje, website available at: https://ejn.gov.si/

APPENDIX C - REST OF EUROPE

A number of European countries are taking steps to tackle marine plastic pollution, by targeting single-use plastics, including in some cases, products made from EPS and XPS.

C.1 Albania *(population 2.86 million)*

In the EEA's assessment[389] of Albanian waste prevention policies, last updated in 2018, there are no references to any marine litter or plastic pollution policies.

Albania is participating in a project[390] financed by the German Federal Ministry for Economic Cooperation and Development (BMZ). The project, titled Integrated Waste Management and Marine Litter Prevention in the Western Balkans, commenced in 2018 and runs until 2022. The primary objective is to enable stakeholders in waste management and recycling in three countries, including Albania, to identify the causes and effects of water pollution, and to reduce the amounts of waste entering the Mediterranean Sea and contributory rivers.

C.2 Belarus *(population 9.4 million)*

It was reported[391] in January 2020, by UNEP, that the Council of Ministers in Belarus had adopted a resolution that would bring about a phased restriction on the sale of certain items from 2021 onwards. The description "…types of disposable plastic goods to be banned in catering places …." is a little vague but is likely to include such products made of EPS and XPS.

A month later, the Deputy Minister of Natural Resources and Environmental Protection was quoted[392] as saying that a total ban on disposable tableware would be in place by 2023, and referenced containers, boxes, dishes and cups that are made wholly or partially from PVC and PS.

C.3 Bosnia–Herzegovina *(population 3.3 million)*

There are no references to any policies relating to marine litter or plastic pollution in the EEA's assessment[393] of Bosnian waste prevention policies, last updated in 2017.

Bosnia-Herzegovina is also participating in the Integrated Waste Management and Marine Litter Prevention in the Western Balkans project (see details under Albania).

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[389] Country Fact Sheets, EEA evaluations of waste prevention programmes, Albania September 2018 available at: https://www.eea.europa.eu/themes/waste/waste-prevention/countries Accessed November 2020.
[390] Integrated Waste Management and Marine Litter Prevention in the Western Balkans, details available at: https://www.giz.de/en/worldwide/80948.html
[391] 'Single-use plastic plates, cutlery and food packaging will be banned in Belarus from 2021', published by UNEP, 17 January 2020, details available at: https://belarus.un.org/en/49505-single-use-plastic-plates-cutlery-and-food-packaging-will-be-banned-belarus-january-2021 Accessed December 2020.
[392] 'Belarus might ban all types of plastic tableware in public catering in 20231', press release published by Belarus, 17 February 2020, details available at: https://www.belarus.by/en/press-center/press-release/belarus-might-ban-all-types-of-plastic-tableware-in-public-catering-in-2023_i_0000108676.html Accessed December 2020.
[393] Country Fact Sheets, EEA evaluations of waste prevention programmes, Bosnia and Herzegovina November 2017 available at: https://www.eea.europa.eu/themes/waste/waste-prevention/countries Accessed November 2020.

At the UN House in Sarajevo, a decision was taken[394] to start phasing out single-use plastics, in the cafeteria and events, in late 2019. A follow-up blog post[395] describes the actions taken to move to a single-use plastic free environment and has photographs of a number of items which have been or will be phased out. Food containers made from EPS and XPS, erroneously labelled as Styrofoam™ are included in the photographs.

C.4 Moldova *(population 2.65 million)*

Over a year ago, it was reported[396] that legislation had been adopted which would ban the distribution of plastic bags, subject to certain conditions, with effect from January 2020. The same law[397] would also bring about restrictions on the sale and use of disposable tableware made of plastic, with effect from January 2021. It has not been possible to verify that these restrictions are coming into force and there are no specific references to products made from EPS or XPS.

C.5 Monaco *(population 39,000)*

A press release[398] issued by the Monégasque government in December 2019 stated that a number of single-use plastic products would be banned from sale and use with effect from January 2020. As the description includes disposable plastic plates, this could cover EPS and XPS products. This action forms part of its "Zero single-use plastic waste by 2030" policy[399].

There is a list[400] of products available made from alternative materials although businesses are encouraged to switch to reusable items where possible.

C.6 Montenegro *(population 622,000)*

The EEA's assessment[401] of waste prevention policies in Montenegro, last updated in 2017, does not reference any marine litter policies.

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[394] 'UN House to become first single-use plastic-free workspace in Bosnia and Herzegovina, published by UNDP, 19 November 2019, details available at: https://www.ba.undp.org/content/bosnia_and_herzegovina/en/home/presscenter/articles/2019/Jointtheplasticfreeworkspaceinitiative.html Accessed December 2020.

[395] 'Single-use plastic free workspaces? It is possible!', by Arijana Drinić and Amina Omićević, published by UNDP, 19 December 2019, details available at: https://www.ba.undp.org/content/bosnia_and_herzegovina/en/home/Blog/single-use-plastic-free-workspaces--it-is-possible-.html Accessed December 2020.

[396] 'Being eco-friendly in Moldova: the facets of the plastic pollution problem and its long-term solutions', by Maria Dulgher, published by Moldova.org, 01 May 2019, details available at: https://www.moldova.org/en/possible-eco-friendly-moldova-facets-plastic-pollution-problem-possible-solutions/ Accessed November 2020.

[397] Republic of Moldova Parliament Law No. 231 from 23.09.2010, revised several times, available at: http://lex.justice.md/md/366254/

[398] 'Combatting plastics in Monaco: On I January plastic cotton buds, cups, cutlery and plates will be banned', published by Gouvernement Princier, 26 December 2019, details available at: https://en.gouv.mc/A-la-Une-du-Portail/Combating-Plastics-in-Monaco-On-1-January-Plastic-Cotton-Buds-Cups-Cutlery-and-Plates-will-be-Banned Accessed December 2020.

[399] 'Single-use plastic ban enters into effect', published by the Monaco Tribune, 09 January 2020, details available at: https://www.monaco-tribune.com/en/2020/01/single-use-plastic-ban-enters-into-effect/ Accessed April 2021.

[400] Alternatives to single-use plastic tableware', published by Gouvernement Princier, available at: https://en.gouv.mc/Policy-Practice/The-Environment/Publications/Alternatives-to-single-use-plastic-tableware

[401] Country Fact Sheets, EEA evaluations of waste prevention programmes, Bosnia and Herzegovina November 2017 available at: https://www.eea.europa.eu/themes/waste/waste-prevention/countries Accessed November 2020.

Montenegro is also participating in the Integrated Waste Management and Marine Litter Prevention in the Western Balkans project (see details under Albania).

Even though Montenegro is not an EU member, it was reported[402] in 2019 that it would incorporate the elements of the SUP Directive into its legal system, though it is not clear in what time-frame the new legislation will be operational.

C.7 North Macedonia *(population 2 million)*

There are no references to any policies relating to marine litter or plastic pollution in the EEA's assessment[403] of Macedonian waste prevention policies, last updated in 2017.

In 2019 the government announced[404] that certain single-use plastic products would no longer be procured by the public sector and included plastic cups and other plastic disposable dishes in the statement. This description is likely to cover EPS and XPS products. The ban was due to take effect from January 2020. The same legislation also required that companies wishing to supply goods to the public sector would have to demonstrate compliance with EPR obligations relating to packaging waste streams.

C.8 Russia *(population 144.4 million)*

As a member of the G20 group of nations, Russia is a partner to the Implementation Framework for Actions on Marine Litter and its corresponding Osaka Blue Vision. In its most recent update[405] dated April 2020, it noted that the principle of EPR and the segregation of waste by consumers had been introduced and it is estimating the socio-economic consequences of a ban on disposable plastic utensils.

C.9 San Marino *(population 33,800)*

It was reported[406] that there was a vote by parliament in 2019 which would commit the government to ban the sale of single-use plastics from 2021 but there are no details about the specific products that would be included in such a ban.

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[402] 'Single-use plastic products to be prohibited in Montenegro', by Feda Šašić, published by Total Montenegro News, 08 July 2019, details available at: https://www.total-montenegro-news.com/lifestyle/4503-plastic-pollution-montenegro Accessed December 2020.

[403] Country Fact Sheets, EEA evaluations of waste prevention programmes, North Macedonia November 2017 available at: https://www.eea.europa.eu/themes/waste/waste-prevention/countries Accessed November 2020.

[404] 'Single-use packaging, plastics banned in state institutions of North Macedonia', by Vladimir Spasić, published by Balkan Green Energy News, 24 December 2019, details available at: https://balkangreenenergynews.com/single-use-packaging-plastics-banned-in-state-institutions-of-north-macedonia/#:~:text=The%20Government%20of%20North%20Macedonia,single%2Duse%20packaging%20and%20plastics.&text=In%20April%20this%20year%2C%20the,straws%2C%20and%20cotton%20buds%20sticks Accessed November 2020.

[405] Russia update, G20 Towards Osaka Blue Ocean Vision, posted 02 April 2020, available at: https://g20mpl.org/partners/russia

[406] San Marino, last update 02 September 2020, published by Platform 2020, details available at: https://platform2020redesign.org/countries/sanmarino/#:~:text=On%2018%20March%202019%2C%20the,single%2Duse%20plastics%20from%202021. Accessed November 2020.

C.10 Serbia *(population 6.9 million)*

In the EEA's assessment[407] of Serbian waste prevention policies, last updated in 2017, there are no references to any policies relating to water-borne / river plastic pollution.

APPENDIX D - MIDDLE EAST

Figure 23. Map of the Middle East

D.1 Egypt *(population 100 million)*

While there appears to be no national policy on single-use plastic products, some provinces, notably in the tourist areas of the country, have introduced[408] restrictions or bans on single-use items such as cutlery and food service containers. As none of the decrees passed appear to be material specific, both EPS and XPS products would be covered.

[407] Country Fact Sheets, EEA evaluations of waste prevention programmes, Austria July 2019 available at: https://www.eea.europa.eu/themes/waste/waste-prevention/countries Accessed November 2020.

[408] 'Egypt in the process of going plastic free: the little things that make a difference', by Zeinab El-Gundy, published by ahram.online, 23 September 2019, details available at: http://english.ahram.org.eg/NewsContent/1/151/351327/Egypt/Features/Egypt-in-the-process-of-going-plasticfree-The-litt.aspx#:~:text=One%20of%20the%20feats%20of,2019%20banning%20single%2Duse%20plastics.&text=But%20in%20three%20months%20time,they%20be%20fined%2C%20she%20added. Accessed January 2021.

D.2 Islamic Republic of Iran *(population 82.9 million)*

Whilst the country is not a member of the G20, it is a partner to the G20 Towards Osaka Blue Vision. In its most recent update[409] to the G20, dated February 2021, it noted that while the country currently has no Action Plan on Marine Litter, it plans to develop one in the near future. Its activities include a draft "Guideline for reducing plastic consumption in the country" but there does not appear to be any specific targets or plans for single-use plastics.

It is interesting to note that, referenced in a report[410] prepared for the G20 update (above), the Caspian Sea Cleanup Activity for 2019 did not list EPS/XPS food containers in the top six items found.

D.3 Israel *(population 9 million)*

In December 2020 the resort town of Eilat on the Red Sea became the first Israeli town to pass a bye-law[411] which prohibits beachgoers from bringing disposable food containers to the coast. The law also bans the sale of food in disposable dishes, which would include containers made from EPS and XPS.

D.4 Jordan *(population 10.1 million)*

The government here published a national action plan[412] for the waste sector in July 2020 which includes a plan to develop a roadmap between the public and private sectors to reduce the consumption of single-use plastic products by both consumers and industry, but there are no specific materials referenced.

D.5 Oman *(population 4.9 million)*

There was an article[413] published in one of the country's leading newspapers in 2019 which pointed to an increase in the use of XPS containers (albeit the article refers to Styrofoam products) by consumers both at home and when dining outside. The author referred to an internal medicine specialist who said that such containers should not be used to heat food or to serve hot beverages. The article then goes on to reference the presence of a styrene as the cause for concern. Another health specialist referred to studies that warn about the risks of hot food from XPS products.

There appears to be no policy in place to address single-use plastic product use in the country.

D.6 Saudi Arabia *(population 34 million)*

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[409] Islamic Republic of Iran update, G20 Towards Osaka Blue Ocean Vision, posted 01 February 2021, available at: https://g20mpl.org/partners/iran

[410] Template for Country updating (information sharing) for the Implementation Framework for Actions on Marine Plastic Litter, Department of Environment, Islamic Republic of Iran, available at: https://papersmart.unon.org/resolution/uploads/template_for_implementation_followup_iran_.pdf

[411] 'Eilat becomes first Israeli city to ban use of plastic and disposable dishes on beaches', published by the Ministry of Environmental Protection, 31 December 2020, details available at: https://www.gov.il/en/departments/news/law_banning_use_of_plastic_disposable_utensils_on_eilat_beaches_approved Accessed February 2021.

[412] Waste Sector Green Growth National Action Plan 2021-2025, published by the Ministry of Environment, July 2020, available at: http://www.moenv.gov.jo/ebv4.0/root_storage/ar/eb_list_page/20022_jordan_waste_v02_rc_web.pdf

[413] 'Hot food in foam plates may pose health risk', by Kabeer Yousuf, published by the Oman Daily Observer, 24 August 2018, details available at: https://www.omanobserver.om/hot-food-in-foam-plates-may-pose-health-risk/ Accessed February 2021.

As a member of the G20 group of nations, Saudi Arabia is a partner to the Implementation Framework for Actions on Marine Litter and its corresponding Osaka Blue Vision. In its most recent update[414] to the G20, dated February 2021, it notes that it has introduced the concept of EPR, has measures in place to reduce single-use plastics consumption on a voluntary basis and plans to develop and implement a Marine Litter Prevention Strategy by 2022.
In April 2017 the government introduced legislation[415] which made it mandatory for certain plastic products, both domestically produced and imported, to be made from an approved oxo-biodegradable material. The first phase of the legislation, which has already been enacted, includes "disposable tableware such as plates, spoons and dinner cups" which would indicate that EPS and XPS food service products are no longer available, as neither material could be stamped as oxo-biodegradable.

D.7 Turkey *(population 82 million)*

There is a Zero Waste programme[416] in place; the only reference to polystyrene is to note that it is rarely recycled and it is a component of packaging foam. The World Wildlife Fund published a report in 2019 which referenced the Zero Waste Programme. The Guide for Policy Makers[417] indicated that the country's waste management infrastructure is chronically under-resourced and there is very little separation of waste; there is no reference to specific plastic materials.

D.8 United Arab Emirates *(population 9.7 million)*

The Environment Agency-Abu Dhabi published a policy on single-use plastics[418] in 2020, with a two-year time-frame in which to accomplish its planned objectives; one of these is to be able to declare that the Abu Dhabi government is free of single-use plastics by the end of 2021. Under the policy, it is planned to develop regulations to reduce the consumption of single-use plastics, initially through the introduction of fees before being phased out completely. As single-use food containers and plates are included in the Priority List, items made from both EPS and XPS will be covered by the eventual ban. The policy also identifies the need for information and education campaigns to reduce (marine) litter.

It was reported[419] in 2015 that Dubai had stopped the use of "Styrofoam" cups for the service of hot beverages due to health concerns on the part of the Supreme Committee for Consumer Protection.

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[414] Saudi Arabia update, G20 Towards Osaka Blue Ocean Vision, posted 01 February 2021, available at: https://g20mpl.org/partners/saudiarabia
[415] 'New regulations for plastics in Saudi Arabia', by Silvana Möhr, published by Switzerland Global Enterprise, 01 April 2020, details available at: https://www.s-ge.com/en/article/news/20173-saudi-arabia-clean-plastic-legislation Accessed January 2021.
[416] 'Zero Waste', published by the Ministry of Environment and Urbanization, available at: http://zerowaste.gov.tr/en/zero-waste/types-of-waste/plastic-waste
[417] *Stop the Flood of Plastic: A Guide for Policy Makers,* by Dalberg Advisors, published by the WWF, 2019, available at: https://wwfeu.awsassets.panda.org/downloads/05062019_wwf_turkey_guidebook.pdf
[418] Single Use Plastic Policy 2020 – Abu Dhabi Emirate, published by the Environment Agency, 2020, available at: https://www.ead.gov.ae/storage/SINGLE%20USE%20PLASTIC%20POLICY%20FINAL%20ENGLISH%20313.pdf
[419] 'Styrofoam cups are not banned', published by News UAE, 16 February 2015, details available at: https://www.thenationalnews.com/uae/styrofoam-cups-are-not-banned-1.54902 Accessed January 2021.

However, The Municipality for Dubai stated that no such ban was in place and that based on international legislation and laws, the material was safe for use.

APPENDIX E – ASIA

E.1 Bangladesh *(population 163 million)*

A Bangladesh-based NGO, Economic and Social Development Organisation (ESDO), conducted a study[420] of single-use plastics in 2019/2020. It reported that 80-85% of single-use plastics used are discarded, leading to pollution issues in the country's rivers and ultimately the Bay of Bengal. The authors include EPS packaging in the list of single-use items and point to the potential for risks to human health from foamed plastic which contains styrene and benzene.

It was reported[421] in January 2020 that the High Court was hearing petitions from NGOs and had ordered the authorities to prepare for a ban on certain single-use plastic items, with a view to having them phased out completely by the end of 2022.It also instructed that substitutes would need to be developed and it is noted that jute is widely available and has the potential to be used in a number of packaging applications.

E.2 Brunei Darussalam *(population 433,000)*

As far back as 2013, the Department of Environment, Parks and Recreation launched[422] a campaign to reduce the use of "Styrofoam" containers in the country. The rationale at the time was twofold; to reduce the amount of litter caused by these products and reduce the "risk of potential health hazards that may come from Styrofoam products".

The campaign may not have been a success as it was announced[423] in April 2019 that the government was considering a ban on the importation of "Styrofoam" into the sultanate. An increase of 3% on the excise duty levied on imports of plastics had not dampened demand sufficiently. It is not clear if the ban has been implemented.

E.3 Cambodia *(population 16.5 million)*

Cambodia is a signatory to the 2019 Bangkok Declaration on Combatting Marine Debris in the ASEAN Region.

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[420] 'Single-Use Plastic (SUP) Pollution and its impact on human health and environment in Bangladesh', published by ESDO, undated, available at: https://esdo.org/press-synopsis-single-use-plastic-sup-pollution-and-its-impact-on-human-health-and-environment-in-bangladesh/

[421] 'Banning single-use plastic products', published by the Financial Express, 08 January 2020, details available at: https://thefinancialexpress.com.bd/editorial/banning-single-use-plastic-products-1578493204 Accessed November 2020.

[422] 'No Styrofoam; Reducing the use of Styrofoam containers', published by the Department of Environment, Parks and Recreation, undated, details available at: http://www.env.gov.bn/SitePages/No%20Styrofoam.aspx Accessed January 2021.

[423] 'Gov't looking to ban import of Styrofoam, single-use plastic bags, by Wardi Wasil, published by The Scoop, 23 April 2019, details available at: https://thescoop.co/2019/04/23/govt-looking-to-ban-import-of-styrofoam-single-use-plastic-bags/ Accessed January 2021.

The UN Development Programme (UNDP) was commissioned by the government to write a report[424] on "plastic foam" use in the country. The publication date is not clear but appears to have been in 2019. The Technical Terms for Reference note that EPS is used in food service takeaway containers and the use of the term Styrofoam is technically incorrect. There is no reference to XPS anywhere in the report.

The use of EPS food service containers is widespread across the country and they are used to package a variety of foodstuffs including rice, noodles, soups, sauces and desserts. Containers are used not only for takeaway purposes but for many diners eating on-site.

It is estimated that most waste EPS collected in urban areas ends up in landfill but in more rural areas, in the absence of proper waste management infrastructure, much of the EPS waste finds its way into waterways or is burned without any safety precautions.

The authors, having reviewed regulations about the use of EPS/XPS across the globe, noted four main challenges for Cambodia as it considers the restriction of the use of certain single-use plastic items:

1. Compostable alternatives are available but are considerably more expensive;
2. A ban on certain items could disproportionately affect lower income communities;
3. Infrastructure, such as composting facilities, would have to be provided;
4. Neighbouring countries would still have such products in circulation (with the inference that the pollution emanating from other countries would not be reduced).

They then explored three options for regulation EPS packaging:

1. To initially tax EPS products on their importation; followed by prohibiting their importation six months later; followed by a total ban six months after that, with exemptions for small businesses;
2. To introduce a total ban, first on imports then on use, only allowing exemptions for areas such as use by hospitals;
3. To tax EPS products on their importation and introduce a ban in public schools only.

The authors concluded that each of these options had strengths and presented challenges but Option 2 would have the greatest environmental effect, although lower income communities would be hit hardest due to the higher cost of alternatives.

It was subsequently reported[425] in November 2019 that the government was considering legislation which would ban the importation of a range of single-use plastic products. Based on the information available such a ban would extend to EPS/XPS food service containers.

[424] Combatting Plastic Foam Use in Cambodia: Policy Report and Suggested Recommendations, by UN Development Programme, undated, available at: https://www.kh.undp.org/content/cambodia/en/home/projects/our-action-for-plastic-pollution-in-cambodia/what-we-re-doing-to-combat-plastic-0.html (scroll down for plastic foam report)

[425] 'Environment Ministry prepares to ban single-use plastic products', by Pech Sotheary, published by the Khmer Times, 14 November 2019, details available at: https://www.khmertimeskh.com/659041/environment-ministry-prepares-to-ban-single-use-plastic-products/ Accessed December 2020.

E.4 China *(population 1.4 billion)*

As a member of the G20 group of nations, China is a partner to the Implementation Framework for Actions on Marine Litter and its corresponding Osaka Blue Vision. In its most recent update[426] to the G20, dated March 2020, it noted the existence of several policies including its Action Plan for Water Pollution Prevention and Control, its support of the Basel Convention on Transboundary Movements of Hazardous Wastes and its participation in the UNEP Regional Sea Action Plan.

Neither the National Export Commodities Packaging Institute[427] (CEPI) nor the China Packaging Federation[428] (CPF) appears to reference EPS or XPS.

While cities and regions in this vast country have a degree of autonomy, the recent restrictions on single-use products appear to emanate from central government.

It was reported in several articles in January 2020 that the government would start phasing out some single-use plastics by the end of 2020. In one article[429] they reference the prohibition of "expanded polystyrene (EPS) foam takeout boxes" among some of the items listed. The article notes that the USA had a $10million trade surplus with China on the export of expanded polystyrene. Another report[430] states that the ban included "disposable plastic foam tableware". The likelihood is that XPS food service containers are included in the items targeted.

In August 2020, the Ministry of Commerce issued a notice[431] on "further strengthening the treatment of plastic pollution in the commercial field. In an article[432] which translates the attached document, detailing the phasing out of certain single-use plastic items, non-degradable tableware for use in dine-in catering services was due to be phased out by the end of 2020 in urban settings. The end of 2025 is the target date for the ban to be rolled out in all other parts of the country. The description used would cover products made from both EPS and XPS as neither degrades.

Under its National Sword Policy[433], China's policy which effectively bans the importation of waste plastics for recycling, the styrene polymer is included, which could extend to compacted EPS and

[426] China update, G20 Towards Osaka Blue Ocean Vision, posted 17 March 2020, available at: https://g20mpl.org/partners/china
[427] CEPI, website available at: http://www.cepi-china.com/English/default.aspx
[428] CPF, website available at: http://www.cpf.org.cn/static/english/index.htm
[429] 'China's ban on single-use plastics won't work', by Clare Goldsberry & Norbert Sparrow, published by Plastics Today, 27 January 2020, details available at: https://www.plasticstoday.com/sustainability/chinas-ban-single-use-plastics-wont-work Accessed January 2021.
[430] 'China's NDRC issues plastics waste restriction by end 2020', by Hui Heng, published by S&P Global, 20 January 2020, details available at: https://www.spglobal.com/platts/en/market-insights/latest-news/petrochemicals/012020-chinas-ndrc-issues-plastic-waste-restriction-by-end-2020 Accessed January 2020.
[431] Notice of the General Office of the Ministry of Commerce on Further Strengthening the Treatment of Plastic Pollution in the Commercial Field, Shangban Circulation Letter (2020) No. 36, published 28 August 2020, available at: http://www.gov.cn/zhengce/zhengceku/2020-09/01/content_5538952.htm
[432] 'China continues efforts to ban and limit use of plastic products', published by Packaging Law, 11 September 2020, details available at: http://www.gov.cn/zhengce/zhengceku/2020-09/01/content_5538952.htm Accessed November 2020.
[433] 'China's National Sword Policy could spur on global recycling', by Dr Michael Dent, published by IDTechEx, 03 September 2020, details available at: https://www.idtechex.com/de/research-article/chinas-national-sword-policy-could-spur-on-global-recycling/21609 Accessed December 2020.

XPS. And according to an announcement[434] posted by the Ministry of Ecology and Environment in November 2020, the import of any solid wastes was to cease in January 2021.

E.5 India *(population 1.36 billion)*

As a member of the G20 group of nations, India is a partner to the Implementation Framework for Actions on Marine Litter and its corresponding Osaka Blue Vision. However, in its March 2020 update[435] it simply states that its policy framework is under progress.

The national packaging institute, the Indian Institute for Packaging[436] (IIP) is an autonomous body under the aegis of the Ministry of Commerce and Industry. There are no references to EPS or XPS.

Thermocol is a term used to describe EPS products across India; it appears to be a generic term[437] rather than a company brand name.

There is no national ban on the use of EPS or XPS items at national level and future actions plans are unclear. In 2019 the government abandoned[438] plans to implement nation-wide legislation to tackle the use of single-use plastic products. A senior civil servant in the environment ministry was quoted at the time as saying that individual states would be encouraged to enforce their own existing laws relating to the manufacture and use of "some single-use plastic products such as polythene bags and Styrofoam".

It has since been reported[439] that the Ministry of Environment, Forest and Climate Change has published draft regulations that would see the introduction of a three-part ban on a range of single-use plastics across the nation. The second part of the regulations, due to commence in January 2022, proposes the prohibition of a number of items including "polystyrene (Thermocol) for decoration". The final part of the regulations, due to come into effect in July 2022, would usher in a ban on the manufacture, importation and sale of other "single-use plastic (including polystyrene and expanded polystyrene) items".

The effectiveness of the regional bans has been queried[440] with lack of enforcement, particularly in relation to the use of single-use plastic bags, cited as a particular concern. Law suits taken by plastics manufacturers, confusion about what products are banned and those which are exempted and variations between laws in states are also contributing to an uneven implementation of the laws. In

[434] Announcement No. 53 of 2020, published by Ministry of Ecology and Environment, 24 November 2020, available at: http://www.mee.gov.cn/xxgk2018/xxgk/xxgk01/202011/t20201125_809835.html

[435] India update, G20 Towards Osaka Blue Ocean Vision, posted 17 March 2020, available at: https://g20mpl.org/partners/india

[436] Indian Institute for Packaging, website available at: https://www.iip-in.com/Default.aspx

[437] EPack Packaging, India, website available at: https://www.epackindia.com/

[438] 'India shelves plan on country-wide ban on single-use plastic products', by Neha Dasgupta, published by Reuters, 01 October 2019, details available at: https://www.reuters.com/article/us-india-pollution-plastic-idUSKBN1WG43W Accessed December 2020.

[439] 'India proposes phase out of single-use plastic items by 2022, published by PackingLaw.com, 05 April 2021, details available at: https://www.packaginglaw.com/news/india-proposes-phase-out-single-use-plastic-items-2022 Accessed April 2021.

[440] 'Plastic ban spread in India. Winners and losers aren't who you'd expect', by Yasaswini Sampathkumar, published by National Geographic, 08 February 2019, details available at: https://www.nationalgeographic.com/environment/2019/02/india-single-use-plastic-bans-maharashtra-tamil-nadu/ Accessed January 2020.

another article[441], a senior manager with an Indian-based NGO agreed that bans can bring about behavioural change and referenced "plastic and Styrofoam", but noted concrete actions, such as subsidies for more expensive alternatives, also need to be provided.

Some states, provinces and cities have introduced laws at regional level to restrict the use of single-use plastic items. According to one 2018 article[442], there are plastic bans in place in 18 states but it is not clear how many cover EPS and/or XPS (Thermocol) products.

E.5.1 Himachal Pradesh

In 2018, the government in this northern state announced[443] that a ban would be introduced on the use of thermocol plates, citing major pollution concerns as the main reason for the implementation. The continuing drought situation was also referenced which the Chief Minister said had been exacerbated by plastic pollution in the state's waterways.

E.5.2 Maharashtra

Situated in the western part of the country, it is India's second-most populous state and home to one its largest cities, Mumbai. A ban[444] on a range of single-use plastic items was introduced in 2018. The legislation included items such as disposable dishes, cups and plates made from plastic and Thermocol. This is a name used for EPS products and under the ban, no such products may be manufactured, imported, distributed or used in the state.

E.5.3 Odisha

In this eastern province, a ban[445] on the importation, sale and use of a range of single-use items, including Thermocol dishes, spoons, cups, bowls and plates, came into effect at the start of October 2019. Only those containers used for packaging milk products were exempted.

E.5.4 Sikkim Province

The Sikkim province, in the northeast of the country, is also its least populous area. In March 2017 the state's government announced[446] an immediate ban on the use of "disposable foam products" including cups, plates and containers, due to pressure on landfill and "environmental concerns", though it is not clear what these are. In 2019 it was reported[447] that while enforcement of the ban

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[441] 'Two more states join anti-plastic bandwagon', published by Down to Earth, 11 July 2018,details available at: https://www.downtoearth.org.in/news/environment/two-more-states-join-anti-plastic-bandwagon-61102 Accessed December 2020.

[442] 'Plastic bans in India extend to 18 states', by K.V Venkatasubramanian, published by c&en, 17 April 2018, details available at: https://cen.acs.org/environment/pollution/Plastic-bans-India-expand-18/96/i17 Accessed November 2020.

[443] 'Himachal Pradesh bans use of thermocol plates, plastic bottles less than 1-litre capacity', by Ashwani Sharma, published by the Indian Express, details available at: https://indianexpress.com/article/india/himachal-pradesh-bans-use-of-thermocol-plates-plastic-bottles-jai-ram-thakur-5205318/ Accessed January 2020.

[444] Update: Plastic ban in Maharashtra & alternative to the banned products, published by Bizongo, 30 June 2018, available at: https://bizongo.com/blog/update-plastic-ban-in-maharashtra-alternative-to-the-banned-products/

[445] 'Odisha bans single-use plastics', by Press Trust of India, published by The Hindu, details available at: https://www.thehindu.com/news/cities/kolkata/odisha-bans-single-use-plastic/article29570059.ece Accessed January 2021.

[446] 'Sikkim becomes first state to ban plastic bottles and disposable foam products', published by Homegrown, 13 March 2017, details available at: https://homegrown.co.in/article/55144/sikkim-bans-foam-items-across-the-state-to-reduce-carbon-footprint Accessed November 2020.

[447] 'India's Sikkim state leads country's plastic ban with bar on bags', by Anjana Pasricha, published by VOA, 29 September 2019, details available at: https://www.voanews.com/south-central-asia/indias-sikkim-state-leads-countrys-plastic-ban-bar-bags Accessed November 2020.

needs to be strengthened, in comparison to other areas of India, Sikkim has much less plastic pollution and the population is far more aware of the issues caused by waste plastics.

E.5.5 Tamil Nadu

In January 2019 a ban was enacted[448] in this southern state, which prohibits a number of items including "thermocol plates and cups". The ban was introduced to curb the harmful effects of plastic on the environment and animals.

In what could be described as an unusual move, the Indian Ministry of Shipping issued a decree, DGS Order No. 05 of 2019[449], which effectively prohibits the use of all single-use plastics on-board ships, both Indian and foreign registered, while berthed in ports in the country and while sailing through its territorial waters. The wide-ranging language used in the order indicates EPS and XPS products are included in the list of banned items. The Order took effect on 01 January 2020.

E.6 Indonesia *(population 270 million)*

Indonesia is a signatory to the 2019 Bangkok Declaration on Combatting Marine Debris in the ASEAN Region.

Made of an archipelago of more than 17,000 islands, Indonesia has literally thousands of miles of coastline and so must be cognisant of the harmful effects of marine plastic pollution, particularly on coastal communities.

As a member of the G20 group of nations, Indonesia is a partner to the Implementation Framework for Actions on Marine Litter and its corresponding Osaka Blue Vision. In its most recent update[450] to the G20, dated March 2020, it noted progress on several fronts including a detailed strategic plan to reduce marine litter by 70% by 2025 and the finalisation of a roadmap for the introduction of EPR for producers of waste. It also pointed to the phasing out of single-use plastic, including "plastic foam (well known as Styrofoam").

Neither the Indonesian Packaging Federation[451] nor the First Packaging Centre[452] makes any reference to any specific packaging materials.

One major producer of polystyrene supports a recycling programme[453] for waste EPS and XPS products in the country.

While there is no national legislation in place to restrict the use of single-use plastics, some regions and cities have introduced their own legislation.

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[448] 'Tamil Nadu plastic ban 2019: List of banned items and eco-friendly alternatives', published by the New Minute, 21 December 2018, details available at: https://www.thenewsminute.com/article/tamil-nadu-plastic-ban-2019-list-banned-items-and-eco-friendly-alternatives-93780 Accessed January 2021.
[449] DGS Order No. 05 of 2019, issued by the Government of India – Ministry of Shipping, 16 October 2019, available at: https://dgshipping.gov.in/writereaddata/News/20191017053347149239 3DGS_Order_05of2019.pdf
[450] Indonesia update, G20 Towards Osaka Blue Ocean Vision, posted 17 March 2020, available at: https://g20mpl.org/partners/indonesia
[451] Indonesian Packaging Federation, website available at: https://packindo.org/about-page/
[452] First Packaging Centre, website available at: http://firstpackagingasia.com/
[453] Trinseo Recycling Program, details available at: https://www.trinseo.com/Sustainability/LetsDoRecyclingProgram-en

E.6.1 Bali

A ban on single-use plastics including "Styrofoam", which the provincial government introduced in 2018, was challenged in court by the local plastic recycling industry. In 2019 the Supreme Court ruled[454] that the ban was constitutional and therefor paved the way for other regions to implement similar legislation.

E.6.2 Bandung

The mayor of this city in West Java announced[455] the introduction of a ban on "Styrofoam for food packaging" in an effort to tackle environmental pollution. There are no details available about the specific of the legislation but the accompanying photograph is of an XPS takeaway container and an XPS tray used for packaging fruit.

E.7 Japan *(population 126 million)*

As a member of the G20 group of nations, Japan is a partner to the Implementation Framework for Actions on Marine Litter and its corresponding Osaka Blue Vision. In its most recent update[456] to the G20, dated April 2020, it pointed to the formulation of its National Action Plan for Marine Plastic Litter in 2019, which has a number of actions designed to prevent the outflow of plastic litter to the ocean.

The Japanese Packaging Institute[457] does not appear to reference either EPS or XPS.

In tandem[458] with a reduction on the use of EPS and/or XPS products, Japan is also focused on improving its already significant recycling infrastructure. It is targeting a recycling rate of 60% for foam food containers by 2030. Anecdotally[459], there is a separate collection service available for used EPS/XPS containers at consumer level which are then recycled.

E.8 Malaysia *(population 32 million)*

Malaysia is a signatory to the 2019 Bangkok Declaration on Combatting Marine Debris in the ASEAN Region.

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[454] 'In Indonesia, a court victory for Bali's ban on single-use plastics', by Basten Gokkon, published by Mongabay, 26 July 2019, details available at: https://news.mongabay.com/2019/07/in-indonesia-a-court-victory-for-balis-ban-on-single-use-plastics/ Accessed December 2020.

[455] 'Bandung City ban styrofoam for food packaging', published by Greeners, 20 October 2016, details available at: https://www.greeners.co/english/bandung-city-ban-styrofoam-for-food-packaging/ Accessed January 2020.

[456] Japan update, G20 Towards Osaka Blue Ocean Vision, posted 02 April 2020, available at: https://g20mpl.org/partners/japan

[457] Japanese Packaging Institute, website available at: https://www.jpi.or.jp/english/index.htm

[458] 'Japan will increase plastic foam recycling rate by 2030', published by Plastic foam news and foam recycling information, 22 May 2019, details available at: http://www.foam-recycling.org/japan-will-increase-foam-recycling-rate-by-2030/ Accessed December 2020.

[459] Sophieyang, blog post, 18 November 2018, details available at: https://sophieyang1026.medium.com/the-use-of-styrofoam-food-containers-in-various-countries-across-the-world-92a0027d8550 Accessed November 2020.

While it appears that there is no country-wide legislation concerning the use of EPS/XPS products one region introduced[460] a ban on the use of such items several years ago. Penang, a state on the west coast of the country, implemented restrictions on the use of polystyrene utensils and food packaging in 2012.

The state government in Malacca implemented[461] a programme "Malacca Without Polystyrene" in 2015 which saw the use of polystyrene food containers banned in government buildings, schools and the food premises of local authorities. The point is made, as has been referenced in many articles in the region, that rainwater can collect in discarded EPS/XPS containers and provide breeding grounds for mosquitoes.

In both cases it appears that EPS/XPS products are included in the bans.

A very interesting paper[462] was written in 2015, on the potential for waste EPS takeaway food containers to be used in the manufacture of bicycle frames. The authors, working in the Design Technology Department of the University of Malaysia, Sarawak, wrote about a case study whereby compressed EPS, from waste containers, was moulded and re-manufactured into frames for new bicycles. They concluded that for low-income communities this process was economically feasible and would place a value on the waste, thereby improving the waste collection infrastructure.

E.9 Myanmar *(population 54 million)*

Myanmar (formerly Burma) is a signatory to the 2019 Bangkok Declaration on Combatting Marine Debris in the ASEAN Region.

Whilst the country is not a member of the G20, it is a partner to the G20 Towards Osaka Blue Vision. In its most recent update[463] to the G20, dated February 2021, it noted its intention to develop a National Plastic Action Plan and its recently published National Waste Management Strategy and Action Plan 2018-2030 which lists plastic as one of the priority waste streams.

A survey[464] carried out by Flora & Fauna International, in 2019, indicated that marine pollution caused by the littering of a number of items, including "polystyrene foam" products, is causing havoc for native turtle species as they try to make their way to the sea after hatching.

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[460] 'Penang extends ban on polystyrene utensils and food packaging', published by The Star, 31 May 2012, details available at: https://www.thestar.com.my/news/nation/2012/05/31/penang-extends-ban-on-polystyrene-utensils-and-food-packaging/ Accessed November 2020.

[461] 'A greener alternative Malacca to ban polystyrene food containers', published by The Star, 02 May 2015, details available at: https://www.thestar.com.my/metro/community/2015/05/02/a-greener-alternative-malacca-to-ban-polystyrene-food-containers Accessed December 2020.

[462] 'Reuse of compressed Expanded Polystyrene (EPS) containers for bike frame constructions in SMEs', by Muhammad Firdaus Abong Abdullah & Mastike Lamat, Universiti Malaysia Sarawak, published December 2015, available at: https://frsb.upm.edu.my/upload/dokumen/FKRSE1_35-40.pdf

[463] Myanmar update, G20 Towards Osaka Blue Ocean Vision, posted 01 February 2021, available at: https://g20mpl.org/partners/myanmar

[464] 'Plastic Pollution piles the pressure on Myanmar's troubled turtles', by Sarah Pocock, Flora & Fauna International, published by Phys.Org, 29 July 2019, details available at: https://phys.org/news/2019-07-plastic-pollution-piles-pressure-myanmar.html Accessed November 2020.

In 2019, the Myanmar Centre for Responsible Business hosted a workshop[465] with several international partners to discuss how plastic pollution could be reduced in the country. Among the topics considered by break-out groups was how to reduce the use of "Styrofoam boxes".

E.10 Pakistan *(population 216 million)*

It was reported[466] in 2018 that a ban would be introduced, by the Punjab Food Authority, on the use of all "styrofoam cups and plates" in a bid to promote greater hygiene in food packaging. The draft regulation of packaging of food material was approved by the scientific panel which advises the Authority. The panel also concluded that "Styrofoam cups and plates are unsafe for food packaging and can cause cancer". It is unclear if the ban has been implemented.

E.11 Philippines *(population 108 million)*

The Philippines is a signatory to the 2019 Bangkok Declaration on Combatting Marine Debris in the ASEAN Region.

An article[467] in 2018 listed 10 places in the Philippines where various bans and restrictions on the use of single-use plastics had been implemented, which in some cases referenced Styrofoam™.

Following the decree by the National Solid Waste Management Commission[468] in 2020, that a number of single-use plastic products be banned from use in government offices, the opposition leader in parliament called for the introduction of nationwide legislation. He argued that the manufacture, import, sale and use of single-use plastic products should be prohibited.

According to a survey[469] conducted by the Global Alliance for Incinerator Alternatives (GAIA) in 2019, 64% of Filipinos felt that "styrofoam or polystyrene food containers" should be banned completely.

Some regions and cities have already implemented laws to restrict or ban the use of certain single-use plastic items.

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[465] 'Reducing Single-Use Plastic in Myanmar', published by the Myanmar Centre for Responsible Business, 05 August 2019, available at: https://phys.org/news/2019-07-plastic-pollution-piles-pressure-myanmar.html

[466] 'Styrofoam cups, plates to be banned across Punjab', published by Pakistan Today, 09 April 2018, details available at: https://archive.pakistantoday.com.pk/2018/04/09/styrofoam-cups-plates-to-be-banned-across-punjab/ Accessed November 2020.

[467] '10 Plastic-Free places in the Philippines', by Christa I. De La Cruz, published by Sport, details available at: https://www.spot.ph/newsfeatures/the-latest-news-features/75882/plastic-free-philippines-a00171-20181201-lfrm Accessed December 2020.

[468] 'Passage of bill on single-use plastics ban pushed', by Filane Mikee Cervantes, published by the Philippine New Agency, 26 February 2020, details available at: https://www.pna.gov.ph/articles/1094875 Accessed January 2020.

[469] 'Philippines: Banning single-use plastics at the national level and strengthening existing laws needed to curb plastic pollution crisis', by Jed Alegado, published by Heinrich Böll Stiftung, 20 January 2020, details available at: https://th.boell.org/en/2020/01/20/philippines-banning-single-use-plastics-national-level-and-strengthening-existing-laws Accessed December 2020.

E.11.1 Cainta

A regional ordinance[470] enacted in 2012 banned the use of a number of single-use plastic items including "… Polystyrene (Styrofoam and Styropor) by commercial establishments as wrapping materials and/or containers for goods and/or food…". The description of cups and food packaging materials made from polystyrene would include both EPS and XPS products. The law goes on to state that "containers made of styrene (Styrofoam/styropor) as packaging materials" are also prohibited.

E.11.2 Cotabato

It was reported[471] that this coastal city was to introduce a ban in May 2014 that would prohibit the use of non-biodegradable plastic as secondary packaging material and "non-biodegradable Styrofoam as food and beverage containers". No further details could be found so it's unclear if the ban was enacted.

E.11.3 Quezon

In 2012, the City Council of Quezon enacted legislation[472] which banned the use of "Styrofoam as packaging container for food produce and other products…" in the city's Hall Complex and in its hospitals. The main objectives were to improve waste and resource management and promote healthy urban environments.

E.12 Republic of Azerbaijan *(population 10 million)*

Whilst the country is not a member of the G20, it is a partner to the G20 Towards Osaka Blue Vision. In its most recent update[473] to the G20, dated February 2021, it pointed to its National Action Plan "Reducing the negative impact of plastic packaging waste on environment in the Republic of Azerbaijan for 2019-2020" and a draft law on packaging and circulation of packaging wastes.

E.13 Republic of Korea *(population 51 million)*

As a member of the G20 group of nations, the Republic of Korea is a partner to the Implementation Framework for Actions on Marine Litter and its corresponding Osaka Blue Vision. In its most recent update[474] to the G20, dated April 2020, it noted a number of policy initiatives including its third National Marine Litter Management Plan (2019-2023) and the launch of an international marine plastic litter task force team. Under the section on Measures, Prevention and Reduction of Marine

[470] Ordinance No. 2012-005 An Ordinance banning the use of thin film, single use carry-out plastic bags and polystyrene (Styrofoam & Styropor) by commercial establishments as wrapping materials and/or containers for goods and/or food in the municipality of Cainta, 05 March 2012, available at: https://sbonecaintalegislation.wordpress.com/2012/03/05/ordinance-no-2012-005-an-ordinance-banning-the-use-of-thin-film-single-use-carry-out-plastic-bags-and-polystyrene-styrofoam-styropor-by-commercial-establishments-as-wrapping-materials/

[471] 'Philippine city to phase out plastics and Styrofoam', by Martin Boyer, published by Food Packaging Forum, 21 February 2014, details available at: https://www.foodpackagingforum.org/news/philippine-city-to-phase-out-plastic-and-styrofoam Accessed January 2020.

[472] Ordinance No. SP-2127, 2012, Quezon City Council, available at: http://quezoncitycouncil.ph/ordinance/SP/sp-2127,%20s-2012-1.pdf

[473] Azerbaijan update, G20 Towards Osaka Blue Ocean Vision, posted 01 February 2021, available at: https://g20mpl.org/partners/azerbaijan

[474] Republic of Korea update, G20 Towards Osaka Blue Ocean Vision, posted 17 April 2020, available at: https://g20mpl.org/partners/republicofkorea

Plastic Generation, it lists projects, one of which supports the voluntary recovery of "waste Styrofoam buoys" from fishermen and another which is focusing on replacing "existing Styrofoam buoys".

In a 2010 paper[475] published by the Ministry of Environment, it noted that EPR Schemes were in place for a range of items including:

- Styrofoam packing material used as packing filler for electronic products;
- Styrofoam boxes for packing agricultural, marine, and livestock products (limited to packaging for food and beverages, agricultural, marine, and livestock products and medical products).

The long term recycling goal for 2012 for "Styrofoam" was 78.1%, up from the 76% recorded in 2010.

Buoys and floats made of EPS are in widespread use around the coast of Korea and their habitation by bristle worms, which eat the EPS and excrete EPS micro-plastics as a result, were the focus of a study[476] by Korean scientists in 2018. As the worms are subsequently eaten by both fish and birds, there is concern about the movement of these EPS micro-plastics further up the food chain. In 2020 the Ministry of Oceans and Fisheries announced[477] its intention to phase out the use of all plastic buoys by 2025, and replace them with "eco-friendly" buoys which the Ministry has developed. The plan also appears to include an element of EPR as it states that buoy manufacturers will be responsible for managing, collecting and recycling buoys.

E.14 Singapore *(population 5.7 million)*

Singapore is a signatory to the 2019 Bangkok Declaration on Combatting Marine Debris in the ASEAN Region.

As a member of the G20 group of nations, Singapore is a partner to the Implementation Framework for Actions on Marine Litter and its corresponding Osaka Blue Vision. In its most recent update[478] to the G20, dated April 2020, it noted that it takes a holistic approach to the problem of marine litter. Among its initiatives is the "Say YES to Less Waste" campaign aimed at bringing about behavioural change relating to single-use plastics and the plan to implement, by 2025, an EPR Scheme for managing plastic packaging waste.

In Singapore "hawker" centres, i.e. food courts selling a myriad of types of cuisine, are popular with residents and workers of all ages. It is not unusual for office workers to buy both their lunch and

[475] Extended Producer Responsibility, Korea Environmental Bulletin Volume VIII 2010, available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/9031/-Korea%20Environmental%20Policy%20Bulletin%20-%20Extended%20Producer%20Responsibility%20(EPR)-2010Extended%20Producer%20Responsibility_KEPB2010.pdf?sequence=3&amp%3BisAllowed=

[476] 'Bristle worms eat plastic', published by Plastic Soup Foundation, 20 August 2018, details available at: https://www.plasticsoupfoundation.org/en/2018/08/bristle-worms-eat-plastic/ Accessed December 2020.

[477] 'S. Korea to ban Styrofoam buoys by 2025', published by Korea Bizwire, 29 May 2020, details available at: http://koreabizwire.com/s-korea-to-ban-styrofoam-buoys-by-2025/161101 Accessed January 2020.

[478] Singapore update, G20 Towards Osaka Blue Ocean Vision, posted 14 April 2020, available at: https://g20mpl.org/partners/singapore

dinner from a local hawker centre. It was reported[479] in 2016 that while a ban on EPS/XPS products was not being introduced by the government, the use of disposable polystyrene foam bowls and plates in hawker centres was to be discouraged with reusable crockery the preference, especially for those customers dining on the premises.

Figure 24. XPS food service containers

E.15 Sri Lanka *(population 21.8 million)*

In September 2017 the government enacted[480] a ban on the manufacture of EPS food containers, plates and cups for use in the domestic market, in order to preserve the environment. The sale and use of such items produced within the country was also prohibited. Manufacturers were given[481] until January 2018 to cease production and make products using alternatives, albeit it appears exports of these products are still allowed.

[479] 'No ban on Styrofoam packaging, but hawkers discouraged from using it', by Audrey Tan, published by the Straits Times, 10 May 2016, details available at: https://www.straitstimes.com/singapore/no-ban-on-styrofoam-packaging-but-hawkers-discouraged-from-using-it Accessed November 2020.

[480] 'Polythene ban to come into place today', by Ayshwarya Yapa, published by Adaderana, 01 September 2017, details available at: http://www.adaderana.lk/news/42787/polythene-ban-to-come-into-place-today Accessed December 2020.

[481] 'Sri Lanka's ban on polythene, styrofoam comes into effect, published by News in Asia, 01 September 2017, details available at: https://newsin.asia/sri-lankas-ban-polythene-styrofoam-comes-effect/ Accessed December 2020.

E.16 Taiwan *(population 23.8 million)*

In 2015, the Environment Protection Agency announced[482] its intention to ban the use of "Styrofoam cups" by the end of that year, citing pollution concerns. A toxicologist was also quoted saying that "Styrofoam can only withstand heat up to 70 degrees before releasing highly toxic benzene" which can be injurious to human health over a long period of exposure.

The ban was challenged[483] by manufacturers who stated that there was already a well-established recycling system for Styrofoam and complained that "Styrofoam has long been stigmatized in Taiwan while it has been widely accepted in other countries, such as the US".

In 2018 the Environmental Protection Agency launched[484] its new Marine Waste Management Action Plan as part of its policy to achieve a plastic-free ocean by 2030. Under the plan, several single-use plastic items, such as disposable cups, were to be banned from 2019. It was then reported[485] in 2018 that the government was implementing a range of laws to reduce the use of disposable food containers (a description which would necessarily cover both EPS and XPS food packaging products) with a view to banning them completely by 2030.

The use of EPS buoys and floats, largely uncovered or wrapped in a protective coating, is widespread throughout the oyster-farming industry in the country. Blocks of EPS are routinely attached to the bamboo oyster rafts in order to keep them afloat and it is estimated[486] that somewhere between 120,000 and 200,000 EPS blocks are used as buoys/floats each year. As many as a third of these are lost due to storms or disposed of illegally annually. In 2019, an article[487] stated that a survey of the marine debris had found that EPS marine litter, from buoys and floats used in Taiwan and elsewhere, was found across the island's western coasts. This was despite the fact that in 2015 and 2016 the government had already established a DRS whereby end-of-life EPS buoys and floats could be returned by oyster farmers to designated collection points.

Separately, the regional government in the city of Tainan, announced[488] a complete ban on the use of uncoated "styrofoam floats and buoys", in order to protect its oyster habitats. The law was due to take effect from 01 October 2019. The council also offered a reward for each buoy/float surrendered for recycling, which was similar to the DRS established in other areas.

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[482] 'Taiwan to ban use of Styrofoam cups', published by the Taiwan News, 03 January 2015, details available at: https://www.taiwannews.com.tw/en/news/2660059 Accessed December 2020.
[483] 'Styrofoam ban angers manufacturer', by Huang Chien-hua, published by the Taipei Times, 16 August 2015, details available at: http://www.taipeitimes.com/News/taiwan/archives/2015/08/16/2003625491 Accessed December 2020.
[484] 'Forging alliances for plastic-free oceans', by Yang Chung-han, published by the Taipei Times, 02 March 2018, details available at: http://www.taipeitimes.com/News/editorials/archives/2018/03/02/2003688511 Accessed January 2021.
[485] 'Taiwan joins the ranks of those banning single-use plastic', by Cody Boteler, published by WasteDive, 23 February 2018, details available at: https://www.wastedive.com/news/taiwan-ban-single-use-plastic-straws/517650/ Accessed December 2020.
[486] 'Upcycling Beach Snow: Clearing Taiwan's oyster farming marine debris', by Grayson Shor, published by the Environmental Change and Security Program, 31 October 2019, details available at: https://www.newsecuritybeat.org/2019/10/taiwan-beach-snow/ Accessed January 2021.
[487] Ibid.
[488] Tainan seeks to protect oysters with Styrofoam ban', by Matthew Lubin, published by Total Taipei, 18 July 2018, details available at: https://www.totaltaipei.com/tainan-protect-oysters-styrofoam-ban/#:~:text=The%20Tainan%20City%20Government%20announced,also%20all%20other%20marine%20life. Accessed December 2020.

E.17 Thailand *(population 69.6 million)*

Thailand is a signatory to the 2019 Bangkok Declaration on Combatting Marine Debris in the ASEAN Region.

In 2018, Thailand made its first steps[489] on a road of banning single-use plastic items, by prohibiting the use of "foam boxes, cups and containers", in all of its national parks, which number in excess of 150. The main objective of the ban was to reduce the pollution caused by the littering of such items though it appears not to have actual legislative backing and little in the way of sanctions or fines for non-compliance.

The country's Roadmap on Plastic Waste Management 2018 - 2030 revealed[490] plans to phase out a wide variety of single-use plastics, including polystyrene foam food containers by 2022.

There appears to be an EPR scheme of sorts[491] in place as manufacturers are required to put their plastic waste "to good use" but it is unclear if this extends to waste EPS/XPS products.

E.18 Vietnam *(population 96.4 million)*

Vietnam is a signatory to the 2019 Bangkok Declaration on Combatting Marine Debris in the ASEAN Region.

At an anti-plastic parade in 2019, which was organised by the Ministry of Natural Resources and Environment, the Prime Minister indicated[492] that the country would see an end to the use of disposable plastic products by 2025. However, no legislative ban at national level appears to have been planned.

In the interim, the city of Hanoi is working[493] with industry to replace the use of certain single-use plastic items, with "environmentally friendly" products, such as food containers made from bagasse, rather than plastic (some of which were likely to be manufactured using EPS and/or XPS).

Back in 2016, it was reported[494] that large volumes of marine plastic litter, much of which was EPS pollution, was found in many parts of the World Heritage Site of Ha Long Bay. Volunteers who

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[489] 'Thailand's National Parks ban plastic bags and Styrofoam containers', by Sarah Williams, published by Culture Trip, 16 June 2018, details available at: https://theculturetrip.com/asia/thailand/articles/thailands-national-parks-ban-plastic-bags-and-styrofoam-containers/ Accessed November 2020.

[490] 'Thailand boldly plans to start banning most harmful plastics as soon as January 2020', published by the Good News Network, 01 December 2019, details available at: https://www.goodnewsnetwork.org/thailand-to-start-banning-most-harmful-plastics-by-years-end/ Accessed November 2020.

[491] 'Environment minister keen on plastic imports ban', published by the Bangkok Post, 04 September 2020, details available at: https://www.bangkokpost.com/thailand/general/1979491/environment-minister-keen-on-plastic-imports-ban Accessed December 2020.

[492] 'Vietnam's PM endorses national campaign to eliminate single-use plastics', published by Saigoneer, 10 June 2019, details available at: https://saigoneer.com/vietnam-news/16685-vietnam-pm-endorses-national-campaign-to-eliminate-single-use-plastic Accessed November 2020.

[493] 'Hanoi says no to plastic bags, disposable plastic products', published by Vietnam Global Net, 03 August 2019, details available at: https://vietnamnet.vn/en/sci-tech-environment/hanoi-says-no-to-plastic-bags-disposable-plastic-products-555819.html#inner-article Accessed November 2020.

[494] 'Tackling Ha Long Bay's polystyrene plague', published by IUCN, 12 July 2016, details available at: https://www.iucn.org/news/viet-nam/201607/tackling-ha-long-bay%E2%80%99s-polystyrene-plague Accessed December 2020.

participated in beach clean-ups reported finding “chunks of EPS” which is used by many fishing villages to float their homes and by floating restaurants. The blocks can disintegrate into smaller pieces over time.

In 2020 the local government announced[495] that a ban, on a pilot basis, would be introduced on the use of certain plastic items on the boats which bring tourists around the islands of the Bay; however, EPS/XPS products were not included despite a finding that “70% of the trash collected was Styrofoam”.

[495] ‘Quang Ninh government to pilot plastic ban on Ha Long Bay’, by Hoang Nguyen, published by Best Price Travel, 11 August 2020, details available at: https://www.bestpricetravel.com/travel-guide/quang-ninh-government-to-pilot-plastic-ban-on-ha-long-bay-460.html Accessed December 2020.

APPENDIX F - AUSTRALIA & NEW ZEALAND

F.1 Australia *(population 25 million)*

Australia has a federal government with each of the six states (New South Wales, Queensland, South Australia, Tasmania, Victoria and Western Australia) and two self-governing territories (Australian Capital Territories and Northern Territories) having the ability to introduce and enact state-wide legislation.

As a member of the G20 group of nations, Australia is a partner to the Implementation Framework for Actions on Marine Litter and its corresponding Osaka Blue Vision. In its most recent update[496] to the G20, dated March 2020, it noted its recent ban on the export of waste plastics, its Marine Debris Threat Abatement Plan and its involvement in the 14-member High Level Panel for a Sustainable Ocean Initiative.

According to a World Wildlife Fund report[497] published in July 2020, Australians consume 3.5mn tonnes of plastic every year. Of this it is estimated that 130,000 tonnes leak into the marine environment, or 5kgs of plastic per head of population. This figure represents about three times the global average. The report proposes three actions that need to be taken at state, territory and federal level in order to tackle this issue:

1) Develop a road map to phase out most types of disposable foodware, packaging and containers;
2) Enact legislation to manage single-use plastics that cannot be phased out;
3) Incentivise development….of sustainable alternatives and systems.

In their recommendations for government, the report suggests that EPS food containers and loose fill "peanuts" are banned with immediate effect while all EPS packaging for consumers should be phased out. The authors highlight successful case studies of reusable container schemes and alternative materials to EPS. There is no reference to XPS in the report.

The Minister for the Environment hosted a National Plastics Summit[498] in March 2020 which involved a large number of cross-sectoral stakeholders and policy makers. Following further engagement, the Minister published the country's National Plastics Plan[499] in March 2021. The plan includes five action areas; under the pillar of prevention there is an action to work with industry to phase out problematic plastic materials. Within that, two EPS applications have been targeted specifically to be phased out:

1. EPS "from loose packaging fill and moulded packaging in consumer packaging" by July 2022;

[496] Australia update, G20 Towards Osaka Blue Ocean Vision, posted 17 March 2020, available at: https://g20mpl.org/partners/australia

[497] 'Plastic Revolution to Reality; A Roadmap to halve Australia's single-use plastic litter', published by WWF Australia July 2020, can be downloaded at: https://www.wwf.org.au/news/blogs/we-have-the-solutions-to-help-end-plastic-pollution-in-australia#gs.k1pkah Accessed November 2020.

[498] National Plastics Summit 2020, hosted by the Minister for the Environment, March 2020, details available at: https://www.environment.gov.au/protection/waste/plastics-packaging/national-summit

[499] *National Plastics Action Plan 2021*, published by the Department of Agriculture, Water and Environment, March 2021, available at: https://www.environment.gov.au/protection/waste/plastics-and-packaging/national-plastics-plan

It's not clear if this will apply to EPS packaging that would be imported on incoming consumer goods or only on those products where the EPS packaging originates in Australia. The accompanying photograph (see below) however is of "peanuts" which generally are not made from EPS.

2. EPS consumer food and beverage containers by December 2022.

This description is not particularly specific but is likely to include bowls, plates and cups. However, as EPS only has been referenced in the Plan, then products made from XPS are not covered. It should be noted though that the accompanying photograph (see below) is of XPS clamshell containers. As the Plan is just recently published, it remains to be seen if the government actually means to target XPS single-use products as well as those made from EPS.

Figure 25. Photographs contained within the Australian National Plastics Plan 2021[500]

EPS Australia[501], the industry group for EPS manufacturers in the country has a map detailing all of the points across the country where householders can deposit their waste EPS for recycling. There are drop-off points in all states and territories and the Expanded Polystyrene Working Group of APCO estimated the recycling rate for EPS to be approximately 29%.

The Australian Packaging Covenant Organisation[502] (APCO) operates as the national regulatory framework which sets out how businesses and governments share the responsibility for managing the environmental impacts of packaging. The Covenant embodies product stewardship and its approach focuses on seven principles.

APCO convened an Expanded Polystyrene Working Group in 2018, as one of five groups coordinated to tackle specific "problematic" packaging materials. The Working Group produced a report[503] which

[500] *National Plastics Action Plan 2021*, published by the Department of Agriculture, Water and Environment, March 2021, available at: https://www.environment.gov.au/protection/waste/plastics-and-packaging/national-plastics-plan
[501] EPS Australia, website at: http://epsa.org.au/
[502] Australian Packaging Covenant Organisation (APCO), details available at: https://apco.org.au/
[503] Expanded Polystyrene Working Group 2018 Report, published by APCO March 2019, available at: https://documents.packagingcovenant.org.au/public-

refers to extruded polystyrene as Foamed Polystyrene and is distinct from expanded polystyrene. The scope included a review of all applications of EPS in terms of packaging but not its use in the construction and insulation industries. Interestingly, the authors identified an issue which has been recurring throughout the research for the OceanWise project – that of trying to get accurate production volumes.

As in many other countries, householders cannot deposit their used EPS containers or packaging with the rest of their recycling; it's up to consumers to drop off their EPS at the recycling points advertised by EPS Australia. For businesses, many of the 40 manufacturers offer a takeback service to their commercial customers. The report's conclusions were that while there are some uses for which alternative materials can and have been found, EPS will continue to be used on a widespread basis in the future and therefore better recycling infrastructure, for both domestic and industrial users, is required.

The Australian Institute of Packaging only references EPS once, in a news item[504] about the winner of alternative materials category at the annual WorldStar Packaging Awards in 2017.

In its threat Abatement Plan[505] for the impacts of marine debris on wildlife, there is no reference to EPS or XPS, although it notes that domestic policies on materials and products stewardship are two of many approaches to try to reduce the flow of litter into the marine environment.

In the second chapter of its report[506] on marine plastics, the Government's Senate Committee for the Environment and Communications noted that, included in the Top 10 items found in beach and waterway clean-ups, were plastic food containers (which could include EPS/XPS items) and foam insulation and packaging (which is likely to include EPS/XPS items).

EPS has been a focus for some time in the country. The federal government commissioned a report[507], which was originally published in 2017 but updated in November 2018. The authors estimated the volume of EPS used across its various packaging and other purposes, identified that its use was growing at the time but recovery was problematic, with most waste EPS going to landfill, rather than being recycled. Three options for management of EPS at end-of-life were assessed:

1) Extended Producer Responsibility (EPR)
2) Product Stewardship
3) Container Deposit Scheme (CDS)

documents/Expanded%20Polystyrene%20(EPS)%202018%20Working%20Group%20Key%20Findings Accessed November 2020.

[504] 'Australia and NZ packaging innovations recognised in WorldStar Packaging Awards', published by the Australian Institute of Packaging, 2017, details available: http://aipack.com.au/australia-nz-packaging-innovations-recognised-in-worldstar-packaging-awards/ Accessed November 2020.

[505] 'Threat Abatement Plan for the impacts of marine debris on the vertebrate wildlife of Australia's coasts and oceans', Commonwealth of Australia, 2018, available at: https://www.environment.gov.au/system/files/resources/e3318495-2389-4ffc-b734-164cdd67fe19/files/tap-marine-debris-2018.pdf

[506] Report – Toxic Tide: the threat of marine plastic, published by the Commonwealth of Australia 2016, available at: https://www.aph.gov.au/parliamentary_business/committees/senate/environment_and_communications/marine_plastics/Report/c02

[507] The Recovery of Expanded Polystyrene in Australia: Current Situation and Future Opportunities, by One Planet Consulting, original publication date August 2017, revised November 2018, available at: https://www.helenmillicer.com/wp-content/uploads/2018/12/2017-18_EPS_PublicReport_OnePlanetConsulting.pdf

However, the report does not recommend any particular approach but notes that EPS is being collected and recycled with some success in certain areas in Australia. Interestingly, in its Appendices it states that recovered EPS is used in the manufacture of XPS insulation sheeting.

In advance of legislative changes[508] which may restrict or ban the use of certain EPS/XPS products, the Australian Packaging Covenant has identified EPS as a priority waste stream. There is one company[509] already working with businesses across the country to collect and compact used EPS which is then exported to be recycled into other goods. There are also some districts offering recycling services[510] for domestic waste EPS.

At least one company based in Australia has developed alternatives to EPS (and potentially XPS). Planet Protector Packaging[511] produces an alternative to EPS made from sheep wool. The company estimates that more than six million (expanded) polystyrene boxes have been displaced by their products.

In the absence of laws at federal level, several states have taken action to tackle certain single-use plastics and details of legislative measures that have been or are to be taken across Australia are provided below.

Figure 26. Map of Australia

[508] 'Businesses take responsibility for EPS before 2025', published by Sustainability Matters, 03 February 2020, details available at: https://www.sustainabilitymatters.net.au/content/waste/article/businesses-take-responsibility-for-eps-before-2025-1457668836 Accessed November 2020.
[509] eCycle, website at: https://ecyclesolutions.net.au/eps-recycling/
[510] Expanded Polystyrene (EPS)Recycling, Council of Toowoomba Region, updated June 2020, details available at: https://www.tr.qld.gov.au/environment-water-waste/waste-recycling/waste-facilities-rubbish-tips/14253-expanded-polystyrene-eps-recycling
[511] Planet Protector Packaging, details available at: https://planetprotectorpackaging.com/

F.1.1 Australian Capital Territory (ACT)

As far back as 2015 a ban or restriction on certain single-use plastics was mooted[512] by a Minister in the ACT government of the time. However, it was 2020 before a Bill, which proposes a number of restrictions, was introduced. The Plastic Reduction Bill[513] is very comprehensive and has three objectives, which are to reduce:

a) The use of plastic in the ACT;
b) The impact of plastic on the environment;
c) The impact of plastic on waste management and resource recovery systems.

Among the list of prohibited plastic products are single-use EPS containers which are defined as "a container used for serving food or a beverage and includes a clam-shell container, cup plate or bowl". However, expanded containers used for the retail supply of food are not prohibited.

The date for the introduction of the legislation has yet to be announced but will possibly be July 2021, which would coincide with the implementation date of the SUP Directive across EU Member States. Interestingly, in the consultation[514] which took place prior to the publication of the Plastics Reduction Bill, 94% of respondents were in favour of a ban on expanded polystyrene food containers.

F.1.2 New South Wales

In 2018, a Member of Parliament introduced a Bill[515] that would have brought in a ban on polystyrene food and beverage containers (by 2018) and polystyrene packaging (by 2020). While the products are not referred to as expanded polystyrene, it is likely that this was the intention, particularly as the focus of the Bill was to reduce the flow of plastics into the marine environment. However, the Bill did not progress to become legislation.

In its consultation paper[516], published in March 2020, the Government of New South Wales included expanded polystyrene food and beverage containers that may be included in a phase-out of a range of single-use plastics.

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[512] 'ACT Government to consider polystyrene foam packaging ban', by Hannah Walmsley with Adam Shirley, published by ABC News 10 February 2015, details available at: https://www.abc.net.au/news/2015-02-10/act-government-to-consider-polystyrene-foam-packaging-ban/6082224 Accessed November 2020.

[513] Plastic Reduction Bill 2020, Exposure Draft, published by the Minister for Recycling and Waste Reduction, available at: https://s3.ap-southeast-2.amazonaws.com/hdp.au.prod.app.act-yoursay.files/5615/9736/2511/Exposure_Draft_-_Plastic_Reduction_Bill.PDF Accessed November 2020.

[514] 'Phasing out single-use plastics; Updated Next Steps Policy', published by the ACT Government in August 2020, available at: https://s3.ap-southeast-2.amazonaws.com/hdp.au.prod.app.act-yoursay.files/7715/9727/3765/200660_Next_Steps_Policy_-_Single_Use_Plastic_WEB2.pdf Accessed November 2020

[515] 'Waste Avoidance and Resource Recovery Amendment (Marine Plastics Reduction) Bill 2018', published by the Government of NSW, available at: https://www.parliament.nsw.gov.au/bill/files/3547/First%20Print.pdf Accessed November 2020.

[516] 'Cleaning Up Our Act: Redirecting the Future of Plastic in NSW – Discussion Paper', published by the NSW Government, available at: https://s3.ap-southeast-2.amazonaws.com/hdp.au.prod.app.nswdpie-yoursay.files/6115/8338/7047/19p2034-nsw-plastics-plan.pdf Accessed November 2020.

F.1.3 Northern Territory

While there appears to be no legislation in place or forthcoming for a territory-wide ban on single-use plastics, the City of Darwin introduced a ban[517] on single-use plastics at any events taking place on Council lands, with effect from January 2019. The events includes markets and as disposable cups, plates, bowls and takeaway containers are listed, this list would include any such products made from EPS and XPS.

F.1.4 Queensland

At the time of writing state election results are awaited so no legislation will be passed while the caretaker government retains control. However, according to a consultation[518] that was run in 2019/2020, there is "strong support for banning takeaway plastic and polystyrene containers and cups" which is likely to include those made from EPS and/or XPS.

In July 2020, it was reported[519] that a policy manager for WWF-Australia has stated that expanded polystyrene should be included in legislation which is to take effect in 2021 which will ban a range of single-use plastic products.

F.1.5 South Australia

According to a press release of the Australian Green Party, South Australia is at the forefront[520] of all Australian states in terms of bringing in legislation to curb the use of plastics etc.

The Single-use and Other Plastic Products (Waste Avoidance) Act 2020[521] was passed by Parliament and commenced[522] in March 2021. Like the Bill in the ACT it sets out specific objectives including to:

a) Provide for the restriction or prohibition of certain single-use and other plastic products;
b) Promote and support better waste management practices including the reduction of marine litter;
c) Promote and support the principles of the waste management hierarchy;
d) Promote and support the principles of the circular economy.

Included in its list of prohibited plastic products are EPS cups, bowls, plates and clamshell containers but there is no reference to extruded polystyrene. The Executive Director of EPS Australia was

[517] 'Plastic Wise', published by the City of Darwin, details available at: https://www.darwin.nt.gov.au/community/programs/climate-change-and-environment/plastic-wise Accessed November 2020.
[518] 'Single-use plastics products ban, Consultation Summary', published by the Queensland Government, available at: https://www.qld.gov.au/__data/assets/pdf_file/0022/133771/single-use-plastics-summary-report.pdf Accessed November 2020.
[519] 'Queensland single-use plastics ban set to pass but some demand more', by Tony Moore, published by the Brisbane Times 12 July 2020, available at: https://www.brisbanetimes.com.au/politics/queensland/queensland-single-use-plastics-ban-set-to-pass-but-some-demand-more-20200710-p55avo.html Accessed November 2020.
[520] 'SA leading the way on single-use plastics', by Sarah Hanson-Young, published by The Greens, 06 July 2020, details available at: https://greensmps.org.au/articles/sa-leading-way-single-use-plastics Accessed January 2021.
[521] Single-Use and Other Plastic Products (Waste Avoidance) Act 2020, published by the South Australian Government, available at: https://www.legislation.sa.gov.au/LZ/C/A/SINGLE-USE%20AND%20OTHER%20PLASTIC%20PRODUCTS%20(WASTE%20AVOIDANCE)%20ACT%202020.aspx
[522] Single-Use and Other Plastic Products (Waste Avoidance) Act (Commencement) Proclamation 2021, published in the South Australian Government Gazette, available at: https://governmentgazette.sa.gov.au/sites/default/files/public/documents/gazette/2021/February/2021_012.pdf

contacted about the omission; he indicated that XPS has already been phased out of use in food containers across Australia but provided no evidence to back up this assertion.

F.1.6 Western Australia

In a discussion paper[523] that the government circulated last year for stakeholder consultation and engagement, there was no reference to EPS or XPS. However, it's likely that some or all of the references to polystyrene actually referred to expanded polystyrene; certainly the image used to describe polystyrene is that of a disposable cup made from EPS. At the time of writing there was no indication however that the discussion paper had advanced or that single-use plastics legislation was imminent.

In the meantime, the Minister with responsibility for the environment announced[524], in August 2020, the launch of a new litter prevention strategy and referenced the commencement of a container deposit scheme. The Containers for Change[525] programme started in October 2020 and gives consumers several return options across a range of beverage containers, for which they can earn a refund.

F.2 New Zealand *(population 4.9 million)*

New Zealand's government oversees national policy and legislative implementation. Its population is a little under five million people.

In December 2019, the Office of the Prime Minister's Chief Science Advisor published a report[526] that had been compiled by a specially convened panel, "Rethinking Plastics in Aotearoa". It is very detailed and covers a broad spectrum of policy areas, actions already underway to tackle the use of plastic and recommendations to improve the management of waste plastic and reduce its use. It references EPS as used in construction and how waste EPS can be poorly managed on building sites. There are no references to XPS.

In August 2020 the government launched a consultation document[527], with a view to introducing legislation that would see the phasing out of a number of single-use plastic items, including polystyrene packaging. In the document it states that references to polystyrene can refer to both hard polystyrene and expanded polystyrene. There are no references to extruded polystyrene.

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[523] 'Let's not draw the short straw, reduce single-use plastics' Issues paper April 2019, published by the Government of Western Australia, available at: https://dwer.wa.gov.au/sites/default/files/20190410%20Single%20Use%20Plastic%20Discussion%20paper.pdf Accessed November 2020.

[524] Keep it clean: New strategy to reduce litter in Western Australia, media statement published the Government of Western Australia, 21 August 2020, available at: https://www.mediastatements.wa.gov.au/Pages/McGowan/2020/08/Keep-it-clean-New-strategy-to-reduce-litter-in-Western-Australia.aspx

[525] Containers for Change, website available at: https://www.containersforchange.com.au/wa/

[526] 'Rethinking Plastics in Aotearoa New Zealand', a report from the panel convened by the Office of the Prime Minister's Chief Advisor, published December 2019, available at: https://cpb-ap-se2.wpmucdn.com/blogs.auckland.ac.nz/dist/f/688/files/2020/02/Rethinking-Plastics-in-Aotearoa-New-Zealand_Full-Report_8-Dec-2019-PDF-1.pdf

[527] Reducing the impact of plastic on our environment: Moving away from hard-to-recycle and single-use items, published by the Ministry for the Environment, available at: https://www.mfe.govt.nz/sites/default/files/media/Waste/Final-Reducing-the-impact-of-plastic-on-our-environment-December.pdf

Among the policy objectives are lowering the risks of environmental damage by reducing the volume of litter, improving the recyclability of plastic packaging and embracing a more circular approach to resource management. Having assessed several options, the government's proposals include:

1) Stage1 - a ban on the manufacture and sale of some food and beverage items that contain polystyrene packaging, by January 2023;
2) Stage 2 - a ban on the manufacture and sale of all food and beverage items that contain polystyrene packaging, and a ban on all EPS packaging by January 2025.

The longer time-frame for the rollout of Stage 2 is to allow time for businesses to find alternatives for those items which may be more difficult to recycle or replace. In the section called "Impacts of Implementation", a number of stakeholders, and both costs and benefits were identified. The consultation period ended in December 2020 and more details from government are awaited.

Another initiative[528] led by Scion, to develop a plastics roadmap for New Zealand, is underway and is scheduled to be completed by the middle of 2021.

There is a packaging compliance scheme in place, Packaging New Zealand[529]. However, it does not reference EPS or XPS.

There is some EPS recycling ongoing with a specific initiative[530] aimed at collecting (clean) waste EPS from building sites. Furthermore, there are drop-off points[531] scattered around the country for domestic consumers to drop off EPS which is collected and brought to one of seven recycling centres.

BioFab[532] is a New Zealand-based company that is focusing on producing mushroom-based compostable material as an alternative to expanded polystyrene. It estimates that approximately 30% of all EPS produced globally ends up in water ways (which would include the marine environment) and leaches toxins (no further details or reference provided). There are no details yet of the specific products the company supplies.

[528] 'Building a roadmap to New Zealand's New Plastic Economy', posted by Scion Research, March 2020, details available at: https://www.scionresearch.com/about-us/about-scion/corporate-publications/scion-connections/past-issues-list/scion-connections-issue-35,-march-2020/building-a-roadmap-to-new-zealands-new-plastic-economy
[529] Packaging New Zealand, website available at: http://www.packaging.org.nz/
[530] 'Recycling Polystyrene from building sites', published by Plastics New Zealand, details available at: https://www.plastics.org.nz/about-us/sector-groups-main/eps-sector-group/eps-news
[531] Polystyrene Waste Collection Points, published by Expol, details available at: https://www.expol.co.nz/polystyrene-waste-collection-points
[532] BioFab, website available at: https://www.biofab.co.nz/

APPENDIX G - PACIFIC ISLAND NATIONS

G.1 Cook Islands *(population 17,500)*

In its Single-Use Plastic Ban Policy 2018-2023 document[533], the Cook Islands government proposes the prohibition of a number of single-use plastic items, including polystyrene containers, meat trays and cups, which are also described as being made from "polystyrene/Styrofoam". The document advises that reusable cups and plates should be promoted and containers made from compostable materials. It is not yet clear if the ban has been enacted.

G.2 Federated States of Micronesia *(population 113,000)*

With effect from July 2020 the government enacted legislation[534] which bans the importation of single-use plastic items including "Styrofoam food service containers". The same law also promotes the importation of products which are reusable, recyclable and biodegradable.

G.3 Fiji *(population 890,000)*

The Fiji Times reported[535] that with effect from January 2021, the country is to phase out the use of all expanded polystyrene but the article provides very few specific details. It goes on to state that consumers should avoid the use of EPS containers and packaging and focus on bringing their own reusable containers to events. It also references the American study that found that styrene could be carcinogenic, when containers, in which styrene is a component, are used for packaging hot beverages or foods. A later article[536], published in November 2020, stated that a ban on the use of "Styrofoam and its related products" would come into effect on 01 January 2021, following consultation with stakeholders.

In December 2020, it was reported[537] that a 6-month grace period would be given for retailers and distributors to use up their stocks of "Styrofoam products" including cups and containers. The Attorney-General is also quoted as saying that the importation of the raw materials for the manufacture of such products is also prohibited under legislation.

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[533] Cook Islands Single-Use Plastic Ban Policy 2018-2023, compiled by Infrastructure Cook Islands, available at: http://ici.gov.ck/sites/default/files/downloads/Cook%20Islands%20Single%20Use%20Ban%20-%20Policy%202018-2023%20FINAL.pdf

[534] 'FSM to ban import of styrofoam and plastic bags', by Louelle Losinio, published by PNC Guam, 14 February 2020, details available at: https://www.pncguam.com/fsm-to-ban-import-of-styrofoam-and-plastic-bags/ Accessed November 2020.

[535] 'Ending Styrofoam use', published by the Fiji Times, 27 August 2019, details available at: https://www.pressreader.com/fiji/the-fiji-times/20190827/281904479839832 Accessed November 2020.

[536] 'Styrofoam ban in Fiji to begin in January 2021', by Fiji Times/PAC News, published by the Pacific Islands News Association, 01 November 2020, details available at: https://www.pina.com.fj/?p=pacnews&m=read&o=5374473705f9f2e99ead1ff89c757c Accessed January 2021.

[537] 'Grace period for sale of Styrofoam products', by Josaia Nanuqa, published by FBC News, 09 December 2020, details available at: https://www.fbcnews.com.fj/news/manufacturing-of-polystyrene-products-ban-from-january-2021/ Accessed January 2021.

G.4 New Caledonia *(population 287,000)*

It was reported[538] in January 2020 that the Congress of New Caledonia had voted to ban or restrict the use of a number of single-use plastic items on a phased basis. With effect from September 2019, the ban was to extend to plastic cups and plates, which could include EPS/XPS products.

G.5 Republic of the Marshall Islands *(population 58,000)*

The Nitijela (Parliament) of these Islands passed the "Styrofoam and Plastics Products Prohibition Act 2016[539]" which took effect from 01 February 2017. The legislation prohibits the importation, manufacture, sale and distribution of "Styrofoam" cups and plates, disposable cups and plates and plastic shopping bags. The restrictions were introduced to regulate the environmental impacts arising from the use of single-use plastic products, safe-guard sea-life for future generations, protect the environment and avoid the adulteration of water with other substances.

G.6 Samoa *(population 197,000)*

The Government here enacted legislation which would have banned the manufacture, importation, distribution and sale of "Styrofoam cups and containers" with effect from January 2020[540]. Through public notices the government advised that the ban would be strictly enforced and products made from alternative suppliers were available. There were due to be some exemptions such as packaging for meat and fish.

However, the implementation of most of the legislation has been delayed twice[541]; in January 2020 for six months, and again in July 2020 for an indefinite period of time. While it is unclear why the introduction of the ban was delayed initially, in July, the ongoing Covid-19 pandemic was given as the reason for the continuing postponement. The only part of the ban currently in force is the importation of such products.

G.7 Solomon Islands *(population 670,000)*

Whilst the country is not a member of the G20, it is a partner to the G20 Towards Osaka Blue Vision. In its most recent update[542] to the G20, dated February 2021, it noted that the process to ban single-use plastics had been initiated in 2019 and the feasibility of a container-deposit scheme was being examined.

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[538] 'New Caledonia bans disposable plastics', by Stéphanie Senet, published by Euractiv, 07 January 2019, details available at: https://www.euractiv.com/section/energy-environment/news/new-caledonia-bans disposable-plastics/ Accessed November 2020.

[539] Styrofoam and Plastic Products Prohibition Act 2016, published by the Nitijela of the Republic of the Marshall Islands, available at: https://rmiparliament.org/cms/images/LEGISLATION/BILLS/2016/2016-0028/StyrofoamandPlasticProductsProhibitionAct2016.pdf

[540] 'Styrofoam ban begins next month', by Soli Wilson, published by the Samoa Observer, 28 December 2019, details available at: https://www.samoaobserver.ws/category/article/55254 Accessed November 2020.

[541] 'Delay to Styrofoam ban disappoints environmentalist', by Tahlea Aualiitia, published by ABC News, 02 July 2020, details available at: https://www.abc.net.au/radio-australia/programs/pacificbeat/samoa-styrofoam-ban/12414438 Accessed December 2020.

[542] Solomon Islands update, G20 Towards Osaka Blue Ocean Vision, posted 01 February 2021, available at: https://g20mpl.org/partners/solomonislands

It was reported[543] in January 2020 that the government was considering the introduction of legislation to ban a range of single-use plastics, including "….plastic and Styrofoam containers takeaways, Styrofoam and plastic cups for drinks…". The chief Environment Officer indicated that scheduled stakeholder consultation meetings would continue in 2020.

G.8 Tuvalu *(population 11,600)*

A ban[544] on the importation, sale and use of a number of single-use items, including "single-use plastic and polystyrene plates, cups and takeaway containers" (which would indicate items made from EPS and/or XPS are included), came into effect on 01 August 2019.

G.9 Vanuatu *(population 300,000)*

This country was the first in the region to establish a National Oceans Policy[545] in 2016, although it contains no references to marine plastic litter or pollution. In February 2018, a ban[546] on the importation of plastic bags and polystyrene takeaway containers came into effect. This followed the signing of a petition by 2,000 citizens of the island in support of a ban on plastic bags.
The ban was enacted to "protect the environment and oceans and keep the country clean and safe" per the country's Prime Minister[547].

[543] 'SI Government to consider ban in single-use', by Agnes Menanopo, published by Environment Media, 10 January 2020, details available at: https://environmentmediasolomonislands.com/index.php/2020/01/10/si-government-to-consider-ban-on-single-use-plastic/ Accessed November 2020.
[544] Waste Management (Prohibition on the Importation of Single-Use Plastic) Regulation 2019, published by the Government of Tuvalu, available at: https://perma.cc/5PBA-T352
[545] Vanuatu's National Ocean Policy, published by the Government of Vanuatu, 30 May 2016, available at: https://www.nab.vu/sites/default/files/documents/Vanuatu_National_Ocean_Policy_High_Res_020616.pdf
[546] 'Vanuatu bans plastic bags and polystyrene containers', by Laura Chalk, published by Planet Ark, 18 January 2018, details available at: https://planetark.org/newsroom/archive/2411 Accessed November 2020.
[547] 'Ban plastics', published by the Daily Post, 19 May 2018, details available at: https://dailypost.vu/news/ban-plastics/article_95b13a08-ef30-5083-a166-3110f092a8c1.html Accessed November 2020.

APPENDIX H - NORTH AMERICA

H.1 Canada

Canada has 10 provinces and three territories and about 37.7 million inhabitants.

As a member of the G20 group of nations, Canada is a partner to the Implementation Framework for Actions on Marine Litter and its corresponding Osaka Blue Vision. In its most recent update[548] in April 2017 it advised that the country has adopted a zero plastic waste vision and pointed to policy and other initiatives such as its Oceans Plastics Charter, involvement in the G7 Innovation Challenge to address Plastic Marine Litter and its Action Plan for plastic waste.

It was announced[549] in Canada in October 2020 that the government there is considering a ban on a range of single-use plastic items including "foodware made from hard-to-recycle plastics". This was a campaign promise made the previous year and it is hoped that the regulations will be in place by the end of 2021. There is very little detail available about the legislation but the photograph[550] which shows the Environment and Climate Change Minister speaking at the news conference to announce the ban shows a clamshell container in the list of single-use items; on this basis it is likely that containers made from XPS will be included in the ban.

In consolidated legislation[551] enacted in 2020, Ozone-depleting Substances and Halocarbon Alternatives Regulations, "closed-cell rigid polystyrene boardstock foam" is referenced in the Definitions Section but is not referred to anywhere else in the text of the document. The legislation bans the manufacture of a number of specified substances or products made from such substances but it does not appear to prohibit the manufacture of EPS or XPS products.

H.1.1 Alberta

In October 2020 the government of Alberta announced its plans to introduce a law which would ban a number of single-use plastic products, if approved, by the end of 2021. Included in the list of items to be prohibited are "Styrofoam dishes and containers".

H.1.2 British Columbia (BC)

In 2018 the City of Vancouver enacted[552] changes to existing legislation which introduced a specific surcharge on the disposal of EPS in landfill, where the load comprised 20% or more of EPS. The change was implemented in an effort to drive up the recycling rate which at the time was estimated to be about 21%.

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[548] Canada update, G20 Towards Osaka Blue Ocean Vision, posted 02 April 2020, available at: https://g20mpl.org/partners/canada

[549] 'Everything you need to know about Canada's single-use plastics ban", by Rebecca Gao, published by the Chatelaine, 13 November 2020, details available at: https://www.chatelaine.com/news/canada-single-use-plastic-ban-faq/ Accessed January 2021.

[550] 'Canada banning plastic bags, straws, cutlery and other single-use items by the end of 2021', by Rachel Aiello, published by CTV News, 07 October 2020, details available at: https://www.ctvnews.ca/climate-and-environment/canada-banning-plastic-bags-straws-cutlery-and-other-single-use-items-by-the-end-of-2021-1.5135968 Accessed January 2021.

[551] Consolidation: Ozone-depleting substances and Halocarbon Alternatives Regulations, published by the Justice Department, Canada, available at: https://laws-lois.justice.gc.ca/PDF/SOR-2016-137.pdf

[552] 'Ban on Styrofoam (Expanded Polystyrene) in Metro Vancouver starting July 1, 2018', published by Creative BC, 06 March 2018, details available at: https://www.creativebc.com/2018/03/06/ban-on-styrofoam-expanded-polystyrene-in-metro-vancouver-starting-july-1-2018.php Accessed January 2021.

With effect from January 2020, a new bye-law[553] was enacted in Vancouver which prohibits the sale and distribution of food service ware "foam containers". The definitions in the text cover both EPS and XPS products, including plates, cups, trays and containers, which cannot be used for prepared food. The ban does not extend to containers for raw meat, fish, poultry or eggs.

It was reported[554] in September 2020 that the State government of BC had approved changes to existing laws which would enable local municipalities to introduce single-use plastic bans without the need for state approval. As most single-use plastic bans in North America have included a ban or restriction on EPS/XPs products, this may lead to more such bans in this particular province. The government also approved bans already put in place by a number of municipalities.

In a blog post[555] written in October 2020, one Canadian environmentalist wrote about finding large volumes of EPS, mainly in block form, scattered around the coastline of Texada, an uninhabited island in Strait of Georgia, BC. She and her colleagues surmised that most, if not all of what they found, emanated from old docks which had broken up in harbours along the coast. The author also references the confusion caused by the myriad of terms used to describe EPS and XPS.

H.1.3 Manitoba

The provincial Legislative Assembly brought forward a Bill[556] in 2019 which will prohibit the sale and distribution of a range of single-use plastics, with effect from 01 January 2025, including "expanded polystyrene foam containers intended for a single-use for food or beverages" and disposable coffee cups, which could be made from EPS or XPS.

H.1.4 North West Territories

The town of Invuik introduced[557] a ban, in March 2020, on the use of "polystyrene (Styrofoam) products" at any events or activities which the Town manages.

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[553] By-Law No. 12416, A By-law to amend License By-Law No. 4450 regarding polystyrene foam, published by the City of Vancouver, available at: https://bylaws.vancouver.ca/consolidated/12416.PDF?_ga=2.261796430.279104679.1610445395-152422861.1610445395

[554] "BC approves civic bylaws banning single-use plastics, provincewide bans on the way", by Jon Hernandez, published by CBC News, 12 September 2020, details available at: https://www.cbc.ca/news/canada/british-columbia/b-c-approves-civic-bylaws-banning-single-use-plastics-provincewide-bans-on-the-way-1.5722133 Accessed December 2020.

[555] 'Polystyrene: the Insidious Plague Impacting BC's coastline', published by Seven in the Ocean, 25 October 2020, details available at: https://sevenintheocean.com/2020/10/25/polystyrene-insidious-plague-texada/ Accessed November 2020.

[556] Bill 244, of the 4th Session, 41st Legislature, published by the Legislative Assembly of Manitoba, available at: https://web2.gov.mb.ca/bills/41-4/b244e.php

[557] 'Town announces ban on foam food containers', published by the Municipal Information Network, 04 March 202, details available at: https://municipalinfonet.com/social/hktb/article/municipal/category/Environment/18/820127/Town-announces-ban-on-foam-food-containers.html Accessed January 2021.

H.1.5 Quebec

In April 2019 the Montreal Executive Committee announced[558] that it was considering the introduction of a bye-law which would lead to a ban on a number of single-use plastics, including polystyrene foam containers. The Committee referenced the environmental pollution problem caused by such products and their inability to decompose in the environment. It's not clear if the bye-law was enacted as planned in 2020.

H.2 Mexico *(population 127.6 million)*

Similar to Guatemala, in advance of any nation-wide ban, one municipality, Jalisco, decided to transition away[559] from several single-use plastic items, with effect from January 2019. Styrofoam is consistently referred to as among the items prohibited but without any further detail. There is no specific reference to food packaging so it's difficult to know if what is actually being banned is XPS takeaway food containers. It is also hoped[560] that the passing of the legislation will lead to more research and development for companies to devise alternative items and the promotion of biodegradable products.

Several other regions have followed suit and it was reported[561] in October 2019 that the State congress in Oaxaca had voted to ban a number of single-use plastic items, including "Styrofoam products".

Mexico City also voted[562] in October 2019 to ban single-use plastics with a list of items that includes "….cups and their covers, trays for transporting food….." This description is quite vague but could include disposable food containers made from EPS and from XPS.

H.3.United States of America

The United States of America comprises 50 States and has a population of approximately 332 million people.

As a member of the G20 group of nations, the US is a partner to the Implementation Framework for Actions on Marine Litter and its corresponding Osaka Blue Vision. In its most recent update[563] to the G20, dated April 2020, the US noted that it has a federal agency charged with addressing marine

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[558] 'Montreal moves to ban single-use plastics, polystyrene foam containers', by the Canadian Press, published by CTV news, 25 April 2019, details available at: https://montreal.ctvnews.ca/montreal-moves-to-ban-single-use-plastics-polystyrene-foam-containers-1.4393732 Accessed January 2021.
[559] 'Jalisco to ban straws, plastic bags & Styrofoam in 2019', by Sergio Blanco, published by Banderas News, 18 July 2018, details available at: http://www.banderasnews.com/1807/nr-jalisco-to-ban-straws-plastics-in-2019.htm Accessed December 2020.
[560] 'Mexican state of Jalisco will ban straws, plastic bags & styrofoam in 2019', published by the Yucatan Times, 22 July 2018, details available at: https://www.theyucatantimes.com/2018/07/mexican-state-of-jalisco-will-ban-straws-plastic-bags-styrofoam-in-2019/ Accessed November 2020.
[561] 'Oaxaca Congress is latest to ban plastic straws, bags and Styrofoam', published by Mexico Daily News, 12 April 2019, details available at: https://mexiconewsdaily.com/news/oaxaca-is-latest-to-ban-plastic/ Accessed December 2020.
[562] 'Mexico City bans single-use plastic', published by Plastic Oceans™, 05 October 2019, details available at: https://plasticoceans.org/prohibiting-single-use-plastics-in-2021-at-cdmx/ Accessed December 2020.
[563] The United States update, G20 Towards Osaka Blue Ocean Vision, posted 02 April 2020, available at: https://g20mpl.org/partners/unitedstates

debris, its Resource Conservation and Recovery Act, its Marine Debris Act and programmes such as Trash Free Waters.

The USA Plastics Pact[564] was launched in August 2020 and is part of the global plastic pact network run under the auspices of the Ellen McArthur Foundation. It has more than 60 members, from private companies to government agencies to NGOs. It subscribes to the same three goals, to advance all plastic packaging to become reusable, recyclable or compostable by 2025.

The National Ocean Service (NOAA) and the Environmental Protection Agency (EPA), together with other federal agencies, announced[565] the launch of a new marine litter strategy in August 2020. The new strategy is built on four pillars:

1. Building capacity for improved waste management;
2. Incentivising global recycling;
3. Promoting research and development;
4. Removing marine litter.

There is no ban on the sale or use of EPS or XPS products in the United States of America at federal level. Actions to date have been taken by individual cities, towns, counties and occasionally at State level. The first ban on EPS/XPS products was introduced more than 30 years ago, when the Town Council in Berkley California implemented restrictions[566] on the sale and use of "ozone-destroying plastic foam food containers" i.e. those containers which contained CFCs, in 1987. An outright ban on "foam cups, plates and hamburger holders" followed in 1990.

Ameripen[567], the US Institute of Packaging, does note reference any specific materials on its website. In its publication[568] on unlocking the recovery of more packaging waste, which reviews case studies from 100 cities across the USA, there is no reference to EPS, XPS or foamed polystyrene.

H.3.1.1 EPS vs Styrofoam vs foamed plastic vs foamed polystyrene

It is noticeable that the interchangeable use of EPS, polystyrene foam, expanded foam and Styrofoam™ is particularly prevalent in the region, with the distinction often blurred while XPS is rarely referenced. While ordinances and legislation often refer to EPS, foamed polystyrene, foamed plastic and/or Styrofoam™, it appears that the intent in most cases is to ban XPS food containers.

It is also noteworthy that often the same definitions and descriptions are used in various ordinances across the country indicating that much of the time, the law from one city or county is copied verbatim by another legislator. This results in the use again of EPS and Styrofoam interchangeably

[564] USA Plastics Pact, website available at: https://usplasticspact.org/
[565] 'NOAA, Federal Partners announce Marine Litter Strategy', published by the National Ocean Service, August 2020, details available at: https://oceanservice.noaa.gov/news/oct20/marine-litter-strategy.html#:~:text=NOAA%2C%20EPA%20and%20other%20federal,and%20development%2C%20and%20removing%20debris.
[566] 'Berkeley Widens Ban on Foam Food Containers', by United Press International, published by the Los Angeles Times, 16 June 1988, details available at: https://www.latimes.com/archives/la-xpm-1988-06-16-mn-6881-story.html Accessed November 2020.
[567] Ameripen, website available at: https://www.ameripen.org/
[568] 'Unlocked Potential: A Roadmap for Improved Packaging Recovery – 100 Cities Findings', published by Ameripen, available at: https://cdn.ymaws.com/www.ameripen.org/resource/resmgr/PDFs/100-Cities-Summary-08.11.14.pdf

where the actual intent is to ban, predominantly, those products usually made from XPS, such as clamshell containers. That noted, there was no evidence of any of the bans having been challenged on this particular basis.

The erroneous use of the term Styrofoam™ continues in the packaging industry where one company[569] claims that they are on a mission "to replace all EPS (Styrofoam) packaging with eco-friendly shippers".

Even the catering industry, one of the biggest users of EPS/XPS products, is guilty of using such poor definitions; the website[570] of an advocacy group for more sustainable restaurant practices, Dine Green, quotes "polystyrene foam (aka Styrofoam™) is made from petroleum…." Another website[571], an online restaurant supplier, has an extensive blog post which discusses the Styrofoam™ bans and even references the correct trademark, but then goes on to use the term interchangeably with EPS.

An environmental NGO, Citizens Campaign for the Environment, headlines their call to action[572] on polystyrene "Say no to Styrofoam!"

Most of the photographs which accompany the ban and regulations notices, be they on the websites for government, news, NGOs and blog posts, are of XPS clamshell containers and other products, despite being referred to as EPS/foamed plastic/foamed polystyrene/Styrofoam™ containers.

This lack of distinction, erroneous use of a trademarked name and interchangeable use of terms for products which are often similar but not identical, are causes for concern as they could lead to challenges by companies who can genuinely argue that their products are not covered by a law which only references Styrofoam™.

It is noticeable that waste food service EPS and XPS products are consistently referred to as being unrecyclable, but it is not always clear that this is due to contamination by food. Sometimes it is referenced that recycling facilities simply do not exist in the region/state and the costs of transporting waste EPS/XPS to a recycling centre are prohibitive.

Many of the ban and restrictions on the sale, supply and use of EPS, XPS and other foam products have also included other items like plastics bags.

Overall, policies have been brought in for one or more of a number of reasons:

- The volume of beach/coastal litter caused by EPS/XPS products
- Marine pollution caused by EPS/XPS products
- Cost of sending EPS/XPS waste products to landfill
- Non-availability of recycling services for food-contaminated EPS/XPS

[569] Vericool, Packaging for a Greener World, website available at: https://www.dinegreen.com/
[570] Reusables and environmentally preferable disposables, published by Dine Green, website available at: https://www.dinegreen.com/disposables Accessed November 2020.
[571] What you need to know about Styrofoam and Plastic Bans', by Rachel Jenkins, published by Webstaurant Store, details available at: https://www.webstaurantstore.com/blog/2436/styrofoam-bans.html Accessed November 2020.
[572] "say not to Styrofoam!", Citizens Campaign for the Environment, website available at: https://www.citizenscampaign.org/say-no-to-styrofoam

Similar to other regions, there are states where many municipalities have taken action to restrict the use of various plastic products, including EPS and XPS; these often go hand-in-hand with bans on other items such as plastic bags. However, there have been some moves by individual State legislatures to stop individual towns, counties and cities from implementing bans of EPS, XPS and other items such as plastic bags, for example in Ohio and South Carolina.

The cost of alternatives is consistently referred to as a reason for not introducing EPS/XPS bans. Undue hardship is a term frequently used to justify not allowing or overturning a ban. Given that the unit costs of containers are generally relatively low and the container cost forms only a small part of the overall price charged to the consumer, it seems to be a weak argument for keeping containers when reusable / recyclable / compostable products could prove to be more cost-effective in the long-term. In light of the number of bans and restrictions being introduced across the region, it would be expected that the cost of alternatives will decrease accordingly over time.

Nearly all the laws examined include fines for violations or non-compliance with the requirements. The severity of the penalties varies greatly with fines starting from as little as $25 up to several thousand dollars.

One US-based NGO operating in the environmental space, 5Gyres, has an interactive map[573] of the globe showing where polystyrene bans and restrictions have been implemented. Their website also refers to “expanded polystyrene foam – better known as Styrofoam” more than once.

H.3.1.2 Extended Producer Responsibility (EPR)

In contrast to many other regions, the concept of EPR is still somewhat in its infancy in the USA. In an article in July 2020, it was reported[574] that only 19 of the 50 states had mandated EPR Schemes in place. In terms of EPR schemes for packaging, draft legislation was introduced[575] in 2019 by members of Congress and the Senate, which proposed that producers would have to finance programmes to manage their products and packaging at end-of-life. The law would also have seen a ban on the use of EPS (referred to as Styrofoam) in food-ware, disposable coolers and shipping packaging.

The text of the draft legislation was opposed by the National Waste and Recycling Association (NWRA) and as the Senate member who supported the law did not run for re-election in 2020, progress on the legislation appears to have halted.

The Recycling Partnership published a Policy Paper[576] in 2020 calling for the introduction of a Packaging and Printed Paper Fee, to be paid for by brand owners and managed by an NGO as a

[573] 5Gyres, website available at: https://www.5gyres.org/polystyrene

[574] ‘The State of Producer Responsibility in the United States’, by Gemma Alexander, published by earth911, 17 July 2020, details available at: https://earth911.com/business-policy/producer-responsibility-in-the-united-states/ Accessed January 2021.

[575] ‘NWRA responds to proposed EPR legislation’, by Megan Smalley, published by Recycling Today, 22 August 2019, details available at: https://www.recyclingtoday.com/article/nwra-responds-proposed-extended-producer-responsibility-udall-lowenthal/ Accessed January 2021.

[576] Accelerating Recycling: Policy to Unlock Supply for the Circular Economy, published by the Recycling Partnership, available at: https://recyclingpartnership.org/accelerator-policy/

Product Stewardship Organisation. It is not clear if EPS/XPS products would be included if such a fee were to be introduced.

No evidence of financial or other incentives to use EPS/XPS products was found. Under the various ordinances there were some which offered a grant to businesses to assist them in the transition away from EPS/XPS products where the alternatives were deemed to be more costly.

H.3.1.3 Recycling

As in many other countries, householders cannot deposit their used EPS containers or packaging with the rest of their recycling; it's up to consumers to drop off their EPS at the recycling points which are available. These are advertised by the local authority/municipality/regional council and the EPS Packaging Industry Alliance runs a locator service on its website[577]. Interestingly, the Alliance also offers a service[578] where consumers can post their waste EPS back to EPS manufacturers, albeit it does not appear to be a free service.

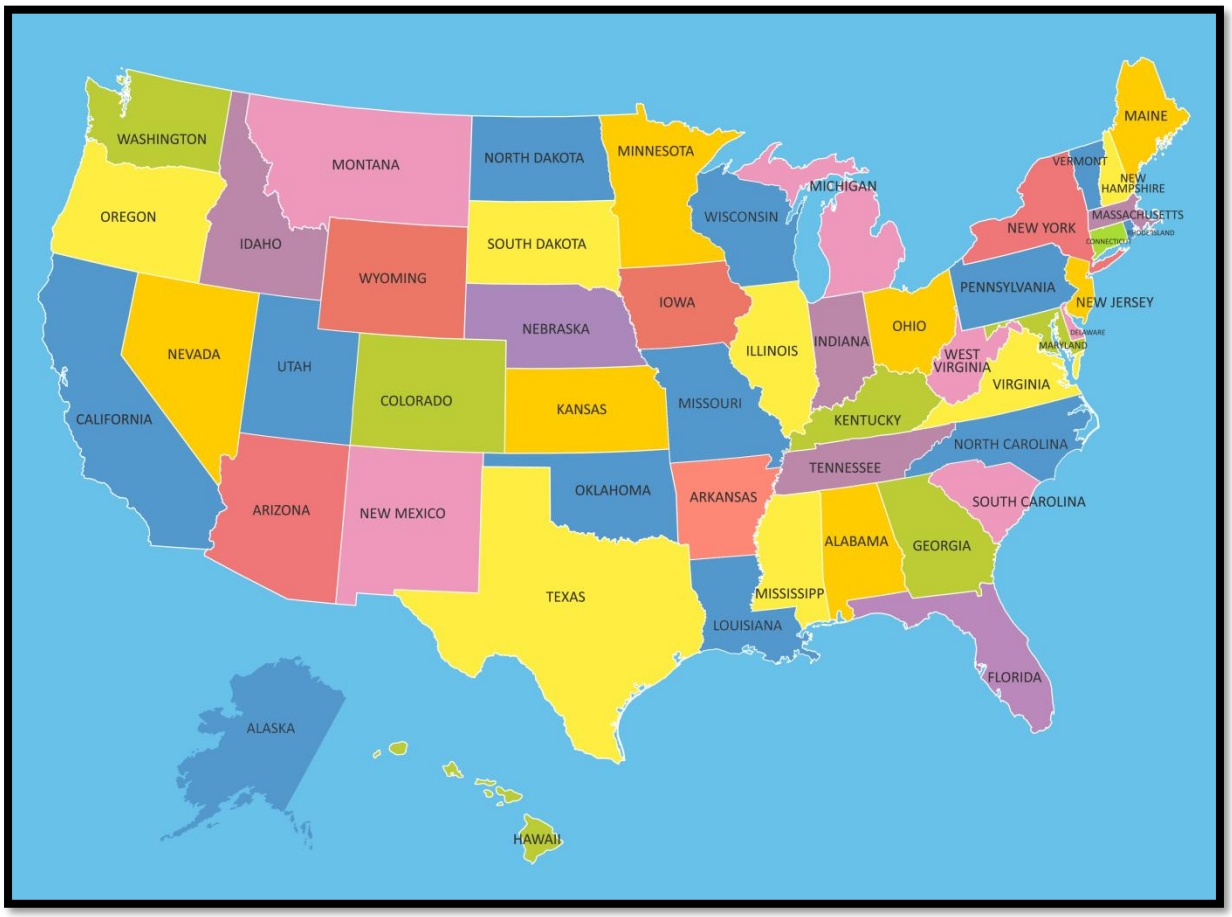

Figure 27. Map of United States of America

[577] EPS Packaging Industry Alliance, locator service available at: http://www.epspackaging.org/index.php?option=com_content&view=article&id=37&Itemid=38

[578] EPS Recycling Mail Back Locations, available at: http://www.epsindustry.org/sites/default/files/2020%20Mail%20Back%20List_0.pdf

H.3.2 Actions at Town / City / State Level

While bans are numerous at county and city level, very little legislative action has taken place at State level, with a few notable exceptions.

A snapshot of actions across the 50 states can be viewed below with more information about specific state actions detailed thereafter:

United States of America	State-wide ban	Municipal bans	City bans	Ban on bans
Alabama				Proposed
Alaska*				
Arizona*				
Arkansas		√		
California		√	√	
Colorado		Proposed		√
Connecticut	Proposed	√		
Delaware		Proposed		
Florida		√		Repealed
Georgia		√		
Hawaii		√	√	
Idaho*				
Illinois			Proposed	
Indiana		√		
Iowa*				
Kansas*				
Kentucky				Proposed
Louisiana*				
Maine	√	√	√	
Maryland	√	√	√	
Massachusetts		√	√	
Michigan		√		
Minnesota			√	
Mississippi				√
Missouri*				
Montana	Proposed			Proposed
Nebraska		√		
Nevada*				
New Hampshire		√		
New Jersey	Due 2022	√	√	
New Mexico		√		
New York	Due 2022	√	√	
North Carolina*				

North Dakota*				
Ohio		√		

*No data available

United States of America	State-wide ban	Municipal bans	City bans	Ban on bans
Oklahoma				√
Oregon		√		
Pennsylvania	Proposed			
Rhode Island		√		
South Carolina		√	√	
South Dakota				√
Tennessee*				
Texas				√
Utah				Proposed
Vermont	√			
Virginia	Proposed			
Washington	Proposed	√		
West Virginia*				
Wisconsin		Voluntary		
Wyoming*				

*No data available

Figure 28. Summary of actions taken by US States

H.3.2.1 Alabama

In 2019, a Bill was proposed[579] by a legislative committee that would ban cities and counties in the state from implementing bans on single-use products including those made from EPS and XPS.

H.3.2.2 Arkansas

Initially the City Council of Fayetteville (population 86,000) implemented laws in May 2019 that banned the purchase of "most Expanded Polystyrene (EPS) foam products (especially single-use bowls, plates and cups)…" by all City Departments. A more wide-ranging ban was then introduced by the City Council which was due to take effect on 01 May 2020 but this was pushed back[580] to 01 July

[579] 'Bag bans banned in 'Bama? Bill would keep Alabama cities from banning plastic bags, foam cups', by Associated Press, published by AL, 09 April 2019, details available at: https://www.al.com/news/2019/04/bag-bans-banned-in-bama-bill-would-keep-alabama-cities-from-banning-plastic-bags-foam-cups.html Accessed December 2020.

[580] Citywide Expanded Polystyrene (EPS) Ordinance, published by the City of Fayetteville, details available at: https://www.fayetteville-ar.gov/3841/Citywide-Expanded-Polystyrene-EPS-Ban Accessed December 2020.

2020 due to Covid-19 concerns. The Ordinance[581], File Number 2019-0647, enacts the regulation of "Expanded Polystyrene (EPS) foam Single-Use plates, bowls, clamshells, cups and similar products".

Attached to the Ordinance is a policy analysis of "Expanded Polystyrene (Styrofoam)" dated August 2019. In it, it refers initially to EPS, then states that it is commonly referred to as Styrofoam and then uses both terms and also polystyrene throughout the remainder of the document. The main driver for the legislation is the amount of litter collected from parks, streams, streets and rivers which is made up of EPS/Styrofoam/polystyrene, plus the associated litter management costs and the environmental damage caused by the litter, particularly when it makes its way into rivers and streams. The lack of suitable recycling facilities for waste EPS products was another major consideration. It was also acknowledged that products made from alternative materials could be more expensive. Three policy options were examined:

a) to make no changes to the local laws
b) to introduce a polystyrene food service ban or
c) to introduce a polystyrene food service and retail ban

A survey of the community was also carried out which largely favoured restrictions. The final decision was to opt for policy option b, i.e. a ban on the supply of EPS/Styrofoam/polystyrene containers for food service. A lead-in period was allowed for restaurants and other outlets to use up existing stocks of banned products.

There is no reference to any improvements to waste management infrastructure or plans to generate consumer awareness of the poor environmental effects of all types of litter.

H.3.2.3 California

With a coastline that stretches for nearly 1,450km, it is hardly surprising that, in the absence of a state-wide ban, California appears to have the highest number of individual town and county restrictions on EPS, XPS and Styrofoam™. The Californians Against Waste website[582] cites 121 cities/councils covered by ordinances across the state. Some of the individual actions taken at local level are listed below.

California was one of the first states to try to introduce a state-wide ban[583] on EPS, in 2018, but there was insufficient support for the bill to pass both parts of government.

The campus authorities in University College San Diego implemented a ban[584] on Styrofoam™ back in 1989, citing the main reason as the lack of bio-degradability of the material.

[581] Ordinance 6250, City of Fayetteville, Arkansas, approved 04 June 2019, available at: https://www.fayetteville-ar.gov/DocumentCenter/View/19881/ORDINANCE-6250---City-Wide-EPS-Ban
[582] Polystyrene: Local Ordinances, published by Californians Against Waste, available at: https://www.cawrecycles.org/polystyrene-local-ordinances
[583] 'California EPS food container ban falls short for second year in a row', by Cole Rosengren, published by WasteDive, 31 January 2018, details available at: https://www.wastedive.com/news/california-eps-food-container-ban-falls-short/515981/ Accessed November 2020.
[584] 'UCSD bans the use of Styrofoam on Campus', by Maureen Fan, published by the Los Angeles Times 20 January 1989, details available at: https://www.latimes.com/archives/la-xpm-1989-01-20-me-1030-story.html Accessed October 2020.

A specific factor that may not have such importance in other locations is the requirement to use water to wash reusable food service ware. This is often cited as a reason not to use reusable products. However, given that drought is a regular occurrence for many towns and counties across California, it hasn't stopped the imposition of the bans with Ordinances, as they are known, in place in more than 100 locations across the state.

The incorrect use of the term Styrofoam™ is particularly prevalent in many of the regulations across the state. The NGO, Clean Water Action: California, has a Fact Sheet[585] titled "Facts about Styrofoam® Litter (Expanded Polystyrene Foam)". It states that EPS was the second most abundant form of beach debris found along the Orange County coast. It also states that the styrene monomer used in the manufacture of EPS is a possible human carcinogen and neurotoxin and can leach into food if the container is heated.

The municipalities, towns, counties and city across California that have enacted legislation that targets EPS and XPS single-use products are listed below:

- Alameda
- Burbank
- Carpinteria
- Del Mar
- Dublin
- Fremont
- Malibu
- San Clemente
- San Francisco
- San José
- San Rafael
- Santa Barbara
- South Lake Tahoe
- South Pasadena

H.3.2.3.1 California – Alameda

Within the County of Alameda, 11 districts have ordinances[586] in place to regulate the sale, supply and use of EPS and XPS food containers. The range of terms used includes polystyrene, Styrofoam™ and polystyrene foam food service ware. Generally the bans are in place for prepared food items for takeaway and the list of items includes bowls, cups, plates and containers. The laws often stipulate the prohibition extends to any events taking place in a public space. The County website supplies a list of suppliers of compostable and recyclable food ware.

[585] 'Facts about Styrofoam® Litter (Expanded Polystyrene Foam)', published by Clean Water Action California, available at: https://www.cleanwateraction.org/files/publications/ca/cwa_fact_sheet_polystyrene_litter_2011_03.pdf

[586] Plastic Foam Food Ware Bans, published by Stop Waste, a public agency reducing waste in Alameda County, available at: https://www.stopwaste.org/at-work/regulations-and-compliance/plastic-foam-food-ware-bans

Interestingly, the City of Davis, which adopted regulations in 2011, specifically notes in its FAQ section[587] that Styrofoam™ is a trademark and does not actually describe polystyrene foam containers. It does however reference all of the banned items as being made from EPS not XPS.

H.3.2.3.2 California – Burbank

It was reported[588] in July 2019 that the City Council had hired a consultant with a view to developing a ban on "expanded polystyrene, commonly known as Styrofoam" within the following year. The consultant would be tasked with meeting restaurant owners and others in the food service industry with a focus on replacing EPS/XPS products with recyclable and/or compostable products.

H.3.2.3.3 California – Carpinteria

Chapter 8[589] of the Municipal Code for this town covers Health and Safety. Part 5 of the Chapter is titled "Regulating Expanded Polystyrene and Single-Use Plastic Products". The purposes of the Code provisions, adopted in March 2019, are to promote the protection of coastal resources and public health, compliance with laws regarding water quality, the reduction of litter generally and a decrease in the volume of waste going to landfill. Expanded polystyrene is the term used throughout the ordinance.

H.3.2.3.4 California – Del Mar

While the Staff report to the Council members states that "EPS is also known as Styrofoam" the Ordinance[590], which was adopted in December 2018, uses the terms expanded polystyrene and non-recyclable plastic for items which are prohibited, mainly in the area of food service. Its purpose is to regulate the use of EPS and non-recyclable plastic disposable food service ware. The Ordinance also includes packing materials such as "expanded polystyrene loose-fill packaging and cushioning material, such as foam peanuts, foam popcorn or packing noodles…." even though many of these items are more likely to be made from XPS.

H.3.2.3.5 California – Dublin

In 2019 it was recommended[591] to the Council that an additional chapter be added to the existing Municipal Code. The County already had a policy in place, since 2010, which banned the use of Styrofoam products at City sponsored activities. The new chapter, which was adopted in August 2019, saw the introduction of a prohibition on City facility users using "disposable food serviceware manufactured with expanded polystyrene". It cited a reduction in landfill and recycling goals as the main purposes for the ban.

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[587] Environmentally Acceptable Food Packaging Ordinance, published by the Davis City Council, available at: https://www.cityofdavis.org/city-hall/public-works-utilities-and-operations/solid-waste-and-recycling/food-packaging-ordinance

[588] 'Burbank officials target polystyrene, single-use products in proposed ban', by Anthony Clark Carpio, published by the Los Angeles Times, 31 July 2019, details available at: https://www.latimes.com/california/story/2019-07-31/burbank-officials-target-polystyrene-single-use-products-in-proposed-ban Accessed December 2020.

[589] Chapter 8.50 Regulating Expanded Polystyrene and Single-Use Plastic products, Carpinteria code of Ordinance, adopted 25 March 2019, available at: https://library.municode.com/ca/carpinteria/codes/code_of_ordinances?nodeId=TIT8HESA_CH8.50REEXPOFOCOPR_8.50.010TI

[590] Ordinance 944, adopted 05 December 2018, published by City Of Del Mar, available at: https://www.delmar.ca.us/DocumentCenter/View/5365/Expandded-Polystyrene-Ban-Ordinance-PDF

[591] Dublin City Council Agenda, 03 September 2019, published by Dublin City Council, available at: https://dublin.ca.gov/DocumentCenter/View/21054/September-3-2019-Agenda-Packet?bidId=

H.3.2.3.6 California – Fremont

In 2010, an Ordinance[592] was adopted by the City Council which banned the use of disposable food service ware made from expanded polystyrene. In the definitions section of the ordinance, there is a comprehensive description of expanded polystyrene which states that it is sometimes referred to as Styrofoam. The regulation also references the possibility of benzene and styrene leaching out from expanded polystyrene food containers as one of the reasons for the introduction of the ban.

H.3.2.3.7 California – Malibu

The City of Malibu introduced a ban on "polystyrene foam food ware" in 2005 and followed this up with additional legislation[593] implemented with effect from January 2017, which also prohibited items made from polystyrene foam such as meat trays, egg carton and packing materials. The ban also extends to coolers, ice chests, pool and beach toys and dock floats, mooring buoys and navigational markers, unless they are encased in another durable material.

H.3.2.3.8 California – San Clemente

The City of San Clemente voted unanimously in 2011 to adopt an Ordinance, 1533[594], which in its definitions refers to "EPS as sometimes called "Styrofoam"…" The ban prohibits the sale and use of EPS disposable food service ware.

H.3.2.3.9 California – San Francisco

At the same times as its near neighbour, the City Council of San Francisco introduced the Food Service and Packaging Waste Reduction Ordinance[595], the text of which is almost identical to that of Malibu (see above). Again, this is in addition to existing regulations dating back to 2007 prohibiting the use of polystyrene foam food ware for prepared food.

H.3.2.3.10 California – San José

In January 2014 the Foam Food Container Ordinance[596] took effect which required restaurants to cease the use of all foam food containers, for both dining-in and takeaway. In its definitions it includes both expanded polystyrene and extruded polystyrene and among the items prohibited are plates, bowls and lidded containers (clamshells). It is worth noting that on the City Council's website[597], they state that the ordinance aims to reduce the amount of littered food service items, made from "expanded polystyrene (EPS), commonly referred to as Styrofoam™". The piece goes onto to note that "although EPS is commonly referred to as 'Styrofoam', the trademarked material manufactured by the Dow Chemical company is not used for food containers".

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[592] Draft Ordinance Number XX-2010, Agenda Item 2.4, City of Fremont, available at: https://www.fremont.gov/DocumentCenter/View/3682/ENC-24-DRAFT-ORDINANCE?bidId=

[593] Polystyrene Ban, City of Malibu, California, available at: https://www.malibucity.org/faq.aspx?TID=29

[594] Ordinance 1533, City Council of San Clemente, adopted 04 January 2011, available at: https://sfenvironment.org/polystyrene-foam-food-service-packaging-waste-reduction-ordinance

[595] Polystyrene Foam and the Food Service and Packaging Waste Reduction Ordinance, SF Environment, a Department of the City and County of San Francisco, published 01 January 2017, available at: https://sfenvironment.org/polystyrene-foam-food-service-packaging-waste-reduction-ordinance

[596] Ordinance 29298, City of San José, published November 2013, available at: https://www.sanjoseca.gov/home/showpublisheddocument?id=1214

[597] City of San Jose, Capital of Silicon Valley, website available at: https://www.sanjoseca.gov/your-government/environment/illegal-dumping-litter/foam-food-container-ordinance

H.3.2.3.11 California – San Rafael

The "Expanded Polystyrene Foam (Styrofoam) Ban[598]" was passed by the City Council September 2012 and took effect on 01 January 2013. The regulations cover all types of food vendors and appear to cover takeaway food containers only. The Council refers to EPS as a "terrible nuisance in our landfills and contains potential carcinogens…".

H.3.2.3.12 California – Santa Barbara

The ordinance which gave rise to the ban on EPS disposable food containers took effect on 01 January 2019. In the list[599] of items covered by the regulations are foam cups, plates, clamshells, bowls, trays and foam coolers, both for dine-in and takeaway options.

H.3.2.3.13 California – South Lake Tahoe

In October 2018 a ban came into effect which had been voted on by the City Council earlier in the year. In both the regulations[600] and the accompanying Fact Sheet the Council refers to Expanded Polystyrene (a.k.a. Styrofoam). The ban covers the use of EPS food and drink containers.

H.3.2.3.14 California – South Pasadena

The text of the South Pasadena ordinance[601] which banned the sale, distribution and use of disposable food service ware, with effect from 01 January 2018, is almost identical to that of South Lake Tahoe (see above). Similar to other regulations, EPS products such as cool boxes, where the EPS is covered in another more durable material, are not included in the ban. Business owners had a period of time during which they had to transition to recyclable or compostable alternatives.

In an act which is at odds with what is happening in other parts of California, the restaurant industry in San Diego has taken legal action against the City Council for trying to implement a ban on "polystyrene foam products". In December 2019, the city's Council announced[602] that it would halt the implementation of the law and conduct a thorough analysis of the effect of the ban on the environment, otherwise known as an Environmental Impact Report (EIR). This is a course of action demanded by the industry as part of their lawsuit which is likely to take year or more to complete. Local environmentalists have expressed concern that this action could affect the bans that have been implemented by other Californian city and town councils.

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[598] Expanded Polystyrene (Foam) Ban, No more foam takeout containers in San Rafael, published by the City of San Rafael, available at: https://www.cityofsanrafael.org/styrofoam-ban/

[599] Foam Ban Information Page, City of Santa Barbara, available at: https://www.santabarbaraca.gov/civicax/filebank/blobdload.aspx?BlobID=213793

[600] Expanded Polystyrene (a.k.a. Styrofoam) Regulations in the City of Salt Lake Tahoe, available at: http://cityofslt.us/942/Expanded-Polystyrene-Ordinance

[601] Polystyrene (aka Styrofoam) Ban, City of South Pasadena, available at: https://www.southpasadenaca.gov/government/departments/public-works/environmental-programs/waste-reduction/polystyrene-aka-styrofoam-ban

[602] 'San Diego halting enforcement of controversial ban on foam containers', by David Garrick, published by the Los Angeles Times, 12 December 2019, details available at: https://www.latimes.com/california/story/2019-12-12/san-diego-halting-enforcement-of-controversial-ban-on-foam-packaging Accessed November 2020.

H.3.2.4 Colorado

In a first for the state, the town of Avon (population 6,500), the Town Council passed[603] unanimously, in January 2020, an Ordinance which "bans expanded polystyrene (i.e. Styrofoam) take-out containers for prepared foods". The law is due to take effect from 01 January 2021 but is dependent on the repeal of a Revised Statute at State level prohibiting the regulation of plastics at local government level.

H.3.2.5 Connecticut

It was reported[604] in February 2020 that a Bill at State level was introduced which would ban schools, restaurants and caterers from the provision and distribution of single-use containers made from EPS. A further measure proposed was the requirement for all schools and colleges to have a plan in place, by July 2021, to discontinue the use of EPS trays.

The objectives of the Bill were two-fold:

1. To reduce the litter caused by such items in parks and waterways and
2. To reduce costs for the management of municipal solid waste.

Testimony submitted[605] by the Citizens Campaign for the Environment to the Environment Committee of the State legislature referenced the issues caused by EPS litter and the health issues caused by styrene if heated or in contact with certain food types.

On 28 February 2020 it was reported[606] that the Environment committee had cleared the way for the Bill to be passed to the Senate for consideration. It's not clear if the Bill has since been passed.

In the town of Norwalk (population 89,000), the Common Council voted[607] in September 2019 to ban "polystyrene, better known as Styrofoam". The ban is quite wide-ranging in that it prohibits the sale, distribution and use, by all food packagers and retail establishments, of polystyrene containers for prepared food and "loose fill packaging". While neither of the terms EPS or XPS are referenced in the article it is likely that one or both materials are those subject to the ban, which was due to take effect in April 2020.

[603] Regulations on Use of Expanded Polystyrene, published by Town of Avon, Colorado, details available at: https://www.avon.org/2099/Proposed-Regulations-on-Use-of-Polystyre Accessed November 2020.
[604] 'CT Environmentalists push to ban plastic foam food containers', by Jack Kramer, published by CT Post, 24 February 2020, details available at: https://www.ctpost.com/local/article/CT-environmentalists-push-to-ban-Styrofoam-food-15080030.php Accessed November 2020.
[605] Testimony to the CGA Environment Committee, by Louis Rosado Burch, Citizens Campaign for the Environment, 21 February 2020, available at: https://www.cga.ct.gov/2020/envdata/tmy/2020HB-05103-R000221-Burch,%20Louis-Citizens%20Campaign%20for%20the%20Environment-TMY.PDF
[606] 'Environment Committee Oks Ban on Expanded Polystyrene', by Walker Strong, published by CT News Junkie, 28 February 2020, details available at: https://www.ctnewsjunkie.com/archives/entry/20200228_environment_committee_oks_ban_on_expanded_polystyrene/ Accessed December 2020.
[607] 'Norwalk bans use of Styrofoam items', by Kelly Kultys, published by The Hour, 10 September 2019, details available at: https://www.thehour.com/news/article/Norwalk-votes-to-ban-styrofoam-14429836.php Accessed November 2020.

H.3.2.6 Delaware

An NGO, Plastic Free Delaware[608], states that it is trying to garner support for laws which would ban polystyrene containers and working with restaurants to reduce their use.

H.3.2.7 Florida

In the town of Satellite Beach (population 11,000) there is a ban[609] on Styrofoam (which is referred to as "formally known as EPS") products being used for the provision of food at any city-sponsored events and at any city locations. The City cites the environmental danger posed by such products when they are littered as the main reason for the ban.

A 6-month lead-in time was included in the Hollywood Beach Ordinance which was adopted in October 2020, which bans a number of items, including sandwich containers, bowls, cups and plates, made from a variety of materials such as polystyrene plastic. The City Council's website[610] states that "polystyrene, best known as Styrofoam, is a non-biodegradable plastic…commonly used in takeout containers, disposable coffee cups…" which indicates that it is items made from XPS which are actually the target of the ban.

The city council of Tampa voted[611] in September 2020 to introduce a ban on distributing "foam cups, plates and other items" on public property. One councillor is quoted as saying that "by moving away from Styrofoam, we can create a more sustainable and resilient city". There is no indication of when the ban is due to be implemented.

Based on the examples above it would appear that previous legislative efforts to prohibit such bans have been successfully overturned; it was reported[612] in 2017 that the Florida Legislature had passed a law at state level which prevented local governments from introducing material-specific bans.

H.3.2.8 Hawaii

In one of the earliest actions of its kind, the University of Hawaii implemented a policy in 2013 that saw the phasing out of EPS on campus. The purpose of the Sustainable Food-Service Product Policy[613] is to eliminate the use of "disposable expanded polystyrene (EPS) foam food-service products on campus". Reusable products and those that are compostable, or can be recycled in Hawai'i, are to be given preference.

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[608] Plastic Free Delaware, website available at: https://plasticfreedelaware.org/polystyrene
[609] Satellite Beach, Florida, website available at: https://www.satellitebeach.org/residents_visitors/styrofoam_ban.php
[610] Plastic and Foam Free Hollywood Beach, published by the City of Hollywood, Florida, website available at: https://www.hollywoodfl.org/1143/Plastic-and-Foam-Free-Beach
[611] 'Tampa targets foam in first effort to reduce single-use plastics', by Zachary T. Sampson, published by the Tampa Bay Times, 04 September 2020, details available at: https://www.tampabay.com/news/tampa/2020/09/03/tampa-targets-styrofoam-in-first-effort-to-reduce-single-use-plastics/ Accessed November 2020.
[612] 'Florida towns started banning Styrofoam. Then industry crumpled the movement', by Bonnie Malloy, published by Earthjustice, 16 November 2017, details available at: https://earthjustice.org/blog/2017-november/florida-towns-started-banning-styrofoam-then-industry-crumpled-the-movement Accessed November 2020.
[613] Sustainable Food-Service Products Policy, Revision #3, 02 April 2013, University of Hawai'i, available at: https://manoa.hawaii.edu/sustainability/2013/04/draft-sustainable-food-service-products-040213-docx/

While there was very little data available for this US State, an article in the local newspaper of Kaua'i indicates that there are bans and restrictions on EPS/XPS products across the Hawaiian Islands. The report[614], written in February 2020, states that Kaua'i is the last county in Hawaii to introduce a ban on the sale and use of "polystyrene foam food containers". Included in the ban are coffee cups, plates and clamshell containers. Trays for meat, poultry, eggs and fish would continue to be allowed.

H.3.2.9 Illinois

In the state capital of Chicago it was reported[615] in January 2020 that there were plans by the Mayor to bring draft legislation forward that would ban the use of "plastic foam packaging" which is in widespread use in many of the city's food courts. The article also stated that of the consumers surveyed about the proposed ban, many were not in favour with one advising that other materials were no less harmful to the environment based on the entire life cycle analysis.

H.3.2.10 Indiana

A Bill[616] to ban "single use Styrofoam carryout containers" which had been introduced in January 2020 failed to be passed on 03 November 2020. It defined containers made of polystyrene foam.

H.3.2.11 Kentucky

A Bill was filed[617] in the state legislature in January 2020 that would ban "foam containers" among other single-use items but does not appear to have progressed.

H.3.2.12 Maine

In 2019 Maine became the first US State to introduce a ban of EPS food packaging at State level. At that stage 14 cities and towns had already introduced local bans and the State Governor, Janet Mills, said[618] that due to the non-economic viability of recycling such products, and their tendency to become micro-plastics, a State-wide ban was justified. In her statement Gov. Mills also said that "polystyrene cannot be recycled like a lot of other products, so while that cup of coffee may be finished, the Styrofoam cup it was in is not". This would indicate that both EPS and XPS food service products are included in the ban, which took effect from 01 January 2021.

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[614] 'Gearing up to ban plastic', by Allan Parachini, published by The Garden Island, 17 February 2020, details available at: https://www.thegardenisland.com/2020/02/17/hawaii-news/gearing-up-to-ban-plastic/ Accessed November 2020.

[615] 'Chicago alderman's plan would ban foam packaging in restaurants and reduce the use of plastic utensils, straws and more', by John Byrne & Sophie Sherry, published by the Chicago Tribune, 15 January 2020, details available at: https://www.chicagotribune.com/politics/ct-lori-lightfoot-ally-proposes-limits-disposable-plastics-20200115-sx2a4nvbfrhwhk2rnmyjbwd5uq-story.html Accessed November 2020.

[616] IN HB 1101, published by Bill Track 50, available at: https://www.billtrack50.com/BillDetail/1173980

[617] 'Kentucky Bill would ban plastic bags, Styrofoam containers', by Ryan Van Velzer, published by WFPL News, 05 January 2020, details available at: https://wfpl.org/kentucky-bill-would-ban-plastic-bags-styrofoam-containers/ Accessed December 2020.

[618] 'Maine enacts first statewide EPS food packaging ban', by Steve Toloken, published by Plastics News, 02 May 2019, details available at: https://www.plasticsnews.com/article/20190502/NEWS/190509983/maine-enacts-first-statewide-eps-food-packaging-ban Accessed November 2020.

The law prohibits[619] the use and distribution of food in disposable EPS foam products, but if an ordinance at local level is more restrictive in nature, then it must be adhered to i.e. the State law does not supersede existing local laws.

In the town of Portland, where a polystyrene product ban was proposed by a Green Packaging Working Group Taskforce, a minority report[620], which objected to the introduction of a ban, was published. The authors were members of the Taskforce who represented businesses in the town and they noted several factors for their view:

- There was a concern that EPS foam food packaging products would simply be replaced with others made from substitute materials which would be littered in the same manner;
- A Life Cycle Analysis was referenced that was carried out which found that EPS foam products had lower overall carbon emissions than many of the materials that would replace EPS;
- The argument is made that EPS products are actually recyclable, albeit they need to be washed clean of any contaminants first;
- The point is made that styrene is not actually toxic per the oft-quoted study by the National Toxicology Program, but is referred to as "reasonably anticipated to be a human carcinogen" but this has not been proven.

H.3.2.13 Maryland

Maryland[621] was due to become the first US State to pass a law banning EPS food containers, in April 2019, when a Bill passed through both legislative houses. However, it was not signed at the time by the Governor and Maine went on to take the mantle. The Bill was signed at a later date and took effect[622] from 01 July 2020. The law prohibits the sale, distribution and use of "EPS Food Service Products" for both food and beverages but it is noted that specific alternative materials are not mandated by the legislation.

One local firm of attorneys writing[623] about the new law noted the incorrect use of the term Styrofoam® generally and that waivers could be applied for by businesses which would suffer undue hardship as a result of the ban. As a result of the state-wide State of Emergency announced due to Covid-19, the deadline for retailers, schools etc, to use up their existing stocks of EPS products was extended[624] to 01 October 2020.

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[619] Disposable Foam Container Toolkit, published by the Natural Resources Council of Maine, available at: https://www.nrcm.org/programs/sustainability/sustainable-maine-community-toolkits/disposable-foam-container-toolkit/

[620] Minority Report in Opposition to Polystyrene Product Ban Proposed by the Green Packaging Working Group Taskforce, published by Government of Portland Main, available at: http://www.portlandmaine.gov/AgendaCenter/ViewFile/Item/205?fileID=872

[621] End of Session Update April 2019, published by Maryland League of Conservative Voters, 29 March 2019, available at: https://www.mdlcv.org/expanded-polystyrene-food-service-products-prohibition-sale-and-use

[622] 'Maryland Styrofoam Ban effective July 1, 2020', published by Deeley Insurance Group, details available at: https://www.deeleyinsurance.com/blog/maryland-styrofoam-ban-effective-july-1-2020/ Accessed December 2020.

[623] 'Maryland Bans Polystyrene and Enacts 31 other New Environmental Laws', published by Kaplow Attorneys At Law, 27 April 2019, details available at: http://www.stuartkaplow.com/legal-library/environmental-law/maryland-bans-polystyrene-enacts-31-new-environmental-laws/ Accessed December 2020.

[624] Public Notice, published by Maryland Department of the Environment, available at: https://mde.maryland.gov/programs/LAND/RecyclingandOperationsprogram/Documents/Expanded%20Polystyrene%20Deadline%20NOTICE%20FINAL.pdf

Several towns already had introduced regulations on the sale and supply of EPS/XPS products prior to the State legislation.

H.3.2.13.1 Maryland – Annapolis

The City Council implemented an Ordinance, O-22-18[625], which banned EPS Foam Food Packaging, including cups, bowls, takeout containers and clamshells, with effect from 01 September 2019.

H.3.2.13.2 Maryland – Baltimore

In October 2019, an Ordinance took effect[626] which the City Council had passed, which banned EPS food containers for the sale and distribution of prepared foods across all food retailers.

H.3.2.13.3 Maryland – Carroll County

The Carroll County Environmental Advisory Council has a comprehensive, 44-page document[627], on EPS Reduction in Carroll County. The report notes that while the US Environmental Protection Agency has not endorsed the use of EPS for food service it has not banned the material from use. The 2018 report comes up with several policy options which may lead to a reduction in the use of EPS in the county.

H.3.2.13.4 Maryland – Montgomery

The County Council enacted legislation[628] in January 2015 which saw food service business prohibited from using "expanded polystyrene (also known as Styrofoam®)" food service ware. The law also banned the sale of such items and loose fill packaging 'peanuts'.

H.3.2.14 Massachusetts

MassGreen, an NGO[629] in Massachusetts, reports that 47 cities and towns have passed polystyrene regulations of one form or another across the State.

In the town of Wayland it was reported[630] that a Polystyrene Container Bye-law was enacted with effect from 01 January 2018 which banned the use and distribution of polystyrene food and beverage and service containers. The post goes on to state that in its blown form it is often referred to as "Styrofoam".

[625] Expanded Polystyrene Foam Food Service Packaging Ban, published by City of Annapolis, Maryland, available at: https://www.annapolis.gov/1554/BANNED-Polystyrene-Food-Packaging
[626] 'Baltimore City Foam Ban', published by the Baltimore Office of Sustainability, available at: https://www.baltimoresustainability.org/baltimore-city-foam-ban/
[627] Expanded Polystyrene (EPS) Reduction in Carroll County: Single-Use Food Service Ware and Loose Fill Packaging Products, published by the Carroll County Environmental Advisory Council, available at: https://www.carrollcountymd.gov/media/5783/eps-report-2018-sep-19-final-w-appen.pdf
[628] Q&A: Ban on the Use and Sale of Expanded Polystyrene Food Service Ware in Montgomery County, Maryland, published by Montgomery Council, available at: https://www.montgomerycountymd.gov/SWS/Resources/Files/expanded-polystyrene/bill-41-14-fact-sheet.pdf
[629] Polystyrene Legislation, published by MassGreen.org, available at: http://www.massgreen.org/polystyrene-legislation.html
[630] 'Polystyrene Food Container Ban, published by Transition Wayland, available at: https://blog.transitionwayland.org/projects/ban-the-plastic-bag-polystyrene-container/polystyrene-food-container-ban/

H.3.2.15 Michigan

In June 2019 a State representative, Yousef Rabhi, a Democrat, announced[631] his intention to introduce a bill that would ban most single-use polystyrene foam at State level, due to its harmful impact on the marine environment.

H.3.2.16 Minnesota

It was reported[632] in 2014 that more than 20 years after Minneapolis city officials banned polystyrene containers, City Councillors had voted to reduce the penalties for non-compliance but ramp up enforcement efforts. The report indicated that the initial ban had not been enforced and significant amounts of "white foam coffee cups and food-to-go containers" would be removed from the fast-food landscape with the advent of tougher compliance actions.

H.3.2.17 Mississippi

In 2018 an Act[633] was passed by the State legislature which prohibits local government from implementing any ban or restriction on the sale and use of "auxiliary containers" or a charge for their use. The text differs to other State laws in that it specifies "plastic" in the list of materials.

H.3.2.18 Missouri

Legislation introduced[634] in 2009 at State level, which was supposed to ban the use of foam coolers at the State's rivers, failed to include polystyrene in the text, due to an amendment error.

H.3.2.19 Montana

A Bill[635] was proposed by a Democrat Representative, Marilyn Marler, at the State legislature in 2019 that would see the introduction of a three-phase ban on polystyrene foam containers:

- From January 2022, the use of polystyrene foam food containers by restaurants;
- From January 2023, the service of prepared food and beverages by a range of establishments;

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631 'Rabhi, Environment Michigan launch campaign to ban Styrofoam in Michigan', by Alex Harring, published by the Michigan Daily, 09 June 2019, details available at: https://www.michigandaily.com/section/government/rabhi-environment-michigan-launch-campaign-ban-styrofoam-michigan-0 Accessed November 2020.

632 'Minneapolis City Council passes ban on polystyrene packaging', by Bill MacAuliffe & Catherine Preuss, published by the Star Tribune, 23 May 2014, details available at: https://www.startribune.com/minneapolis-city-council-passes-ban-on-polystyrene-packaging/260490541/ Accessed November 2020.

633 Senate Bill 2570 (As Passed the Senate), published by the Mississippi Legislature, available at: http://billstatus.ls.state.ms.us/documents/2018/html/SB/2500-2599/SB2570PS.htm

634 'Missouri law targets wrong plastic in foam cooler ban', by Ben Dubose, published by Independent Commodity Intelligence Services, 25 August 2009, details available at: https://www.icis.com/explore/resources/news/2009/08/25/9242756/missouri-law-targets-wrong-plastic-in-foam-cooler-ban/ Accessed December 2020.

635 'Bill would send some Styrofoam uses packing', by Phil Drake, published by Great Falls Tribune, undated, details available at: https://eu.greatfallstribune.com/story/news/2019/01/28/montana-lawmakers-consider-banning-some-uses-styrofoam/2705178002/

- From January 2024, the packaging of meat, eggs and other foods in polystyrene foam containers.

However, a new Bill[636] has since been proposed by Republican Representative, Mark Noland, which would prohibit local governments and councils within the state from introducing any form of regulation of food service packaging. Neither Bill appears to have progressed at the time of writing.

H.3.2.20 New Hampshire

In the first of its kind in the state, the City Council of Portsmouth voted[637] to ban "plastic foam cups and containers" in October 2019. The Council also approved an ordinance to regulate the use of single-use plastics at official City events.

H.3.2.21 New Jersey

In May 2022, a state-wide law[638] will take effect that will prohibit single-use plastics including "disposable food containers and cups made out of polystyrene foam". The primary aim is to tackle the pollution caused by such items, both on the ground and in the marine environment.

In the county of Bergen in New Jersey, there is an initiative running between a number of cities called Sustainable Jersey Bergen Hub. Within this grouping, which was formed to increase collaboration between cities in Bergen on environmental issues, there is a Styrofoam Committee. Under its auspices there is a "Styrofoam-Free" programme which is an initiative to encourage businesses to stop the use of EPS and XPS products. In an article[639] about the programme, it is noteworthy that while the author makes it very clear that Styrofoam is actually a registered trademark and describes XPS used for insulation purposes only, she then goes on to state that Styrofoam is a public health issue as "it exposes people to carcinogens particularly when used with hot foods".

H.3.2.22 New Mexico

In Bernalillo County, an ordinance took effect[640] from 01 January 2020 which saw the introduction of a ban on single-use polystyrene containers and covers any retailer selling food. The description

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[636] 'Montana GOP usurps local choice with bill prohibiting regulation of food containers', by Mike Dennison, published by Missoula Current, 24 February 2021, details available at: https://missoulacurrent.com/government/2021/02/gop-food-containers/ Accessed April 2021.

[637] 'City Council bans foam cups, containers', published by AP, 09 October 2019, details available at: https://bangordailynews.com/2019/10/09/news/portsmouth-city-council-bans-plastic-foam-cups-and-containers/ Accessed December 2020.

[638] 'Governor Murphy signs legislation banning single-use paper and plastic bags in New Jersey', press release published by the State of New Jersey, 04 November 2020, details available at: https://www.nj.gov/governor/news/news/562020/20201104a.shtml Accessed January 2021.

[639] 'Local volunteer leading effort to ban Styrofoam in Englewood', by Hilary Viders, published by the Press Group, 20 January 2020, details available at: https://thepressgroup.net/local-volunteer-leading-effort-to-ban-styrofoam-in-englewood/ Accessed November 2020.

[640] Plastic and Polystyrene Bans FAQs, published by Bernalillo County, available at: https://www.bernco.gov/planning/plastic-and-polystyrene-ban-faqs.aspx

provided states that polystyrene foam is “blown polystyrene and expanded or extruded foams using a styrene monomer”.

In a progressive move, the temporary administrative committee of the County is due to evaluate the impact of the ordinance and must submit its report to the County Board of Commissioners by the end of June, 2022.

H.3.2.23 New York

The State of New York will see a state-wide ban[641] go into effect from January 2022. The ban will prohibit the sale, distribution and use of disposable food service containers that contain expanded polystyrene and loose fill packaging (referred to as packing peanuts). The law[642] defines “a container as a bowl, carton, clamshell, cup, lid, plate, tray….” and will cover all retailers of both dine-in and takeaway prepared food. Again, the US Department of Health’s National Toxicology Program referral to styrene as a “reasonably anticipated human carcinogen” is referenced. The amount of litter caused by single-use EPS and XPS products and the difficulties with recycling them are also cited.

The press release[643] issued by the office of the State Governor, Andrew Cuomo, when the proposal was still making its way through the legislative process, the Governor is quoted as saying “Styrofoam is one of the most common pollutants and public health hazard that impacts humans and the environment alike”.

H.3.2.23.1 New York - Colgate University

In 2015, the Student Government Association at the university, which has its own Budget Allocation Committee (BAC), voted[644] to ban the purchase of Styrofoam by BAC-funded groups and events. This meant any food/drink ordered on campus could not be delivered in Styrofoam containers. The Association hoped that its action would lead to a wider campus ban on the material.

H.3.2.23.2 New York - New York City

A ban on EPS products had been mooted for some years, with the City Council considering a law[645] “…in relation to restrictions on the sale or use of certain expanded polystyrene products” as far back as 2013. A grace period was to be given to assist with the transition away from EPS products but

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641 ‘New York bans expanded polystyrene foam products’, published 09 April 2020 by Waste360, details available at: https://www.dec.ny.gov/chemical/120762.html#:~:text=In%202020%2C%20New%20York%20State,materials%20known%20as%20packing%20peanuts.&text=To%20protect%20people%20and%20the,be%20banned%20in%20New%20York. Accessed January 2021.

642 Section 27-3001, Environmental Conservation, published by the New York State Senate, available at: https://www.nysenate.gov/legislation/laws/ENV/27-3001

643 Governor Cuomo unveils 5th proposal of 2020 State of the State: Banning the use of single-use Styrofoam containers in New York State, published by New York State, 17 December 2019, details available at: https://www.governor.ny.gov/news/governor-cuomo-unveils-5th-proposal-2020-state-state-banning-use-single-use-styrofoam-food Accessed December 2020.

644 ‘Say goodbye to Styrofoam’, by Sara Rees, published by the Sustainability Office, Colgate University, 17 March 2015, details available at: http://blogs.colgate.edu/sustainability/2015/03/17/say-goodbye-to-styrofoam/ Accessed November 2020.

645 Committee on Sanitation and Solid Waste Management, The New York City Council, details available at: https://legistar.council.nyc.gov/LegislationDetail.aspx?ID=1444213&GUID=71AB91E9-EC77-47F0-B904-4D4B4A607568&Options=ID%7cText%7c&Search=142 Accessed October 2020.

some manufacturers and restaurant lobby groups brought a challenge to the law, which they lost[646] in June 2018. At the time, one of the reasons for the ban was that EPS containers are not recyclable, despite calls to the contrary by the industry. This may have been a determining factor in the outcome of the case as officials also took this stance, with the Sanitation Commissioner stating[647] "as we had previously determined, expanded polystyrene cannot be recycled".

Here, as elsewhere, EPS and Styrofoam™ became interchangeable with one New York City Council member stating his satisfaction[648] at the dismissal of the court case and "If we are going to reach our goal of zero waste to landfill by 2030, we must begin targeting materials like Styrofoam". There appears to have been no reference to health concerns with the introduction of the ban.

The legislation was enacted and became enforceable on 01 January 2019[649] and prohibits the sale and use of:

- EPS single-service items including cups, bowls, plates, trays, takeout containers
- EPS loose-fill packing peanuts

Consumers are encouraged to bring their own reusable containers for coffee, takeout meals and leftovers from restaurants, but there is no system for deposit-return or an EPR system.

It should be noted that the city's Department of Sanitation undertook[650] a study to determine if food service foam containers could be recycled successfully, following a challenge to its legislation in court. It was not deemed to be feasible and also found that in other municipalities which had instituted food waste EPS/XPS recycling programmes, most of the products collected still ended up in landfill.

H.3.2.23.3 New York – Westchester County

A Local Law, LL-2019-7, was adopted[651] in June 2019 which regulates the use of expanded polystyrene containers. It bans the sale, distribution and use of such containers for prepared food and includes containers, bowls, trays and cups. The Committee on Environment, Health and Energy submitted a recommendation to the Board of Legislators that the local law be passed and pointed out that expanded polystyrene was commonly but incorrectly referred to as Styrofoam™. The Committee oversaw the completion of a Fiscal Impact Statement and an Environmental Assessment.

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[646] 'Judge backs NYC in ban on plastics foam food containers', published 09 June 2018 by NBC New York, details available at: https://www.nbcnewyork.com/news/local/judge-backs-nyc-in-ban-on-plastic-foam-food-containers/1663900/ Accessed October 2020.

[647] 'Mayor De Blasio announces ban on single-use styrofoam products in New York City will be in effect beginning 2019', published 13 June 2018 by the New York City official website, details available at: https://www1.nyc.gov/office-of-the-mayor/news/295-18/mayor-de-blasio-ban-single-use-styrofoam-products-new-york-city-will-be-effect Accessed October 2020.

[648] NYC wins legal battle to ban single-use Styrofoam in 2019', by Andres O'Hara, 14 June 2018 published by gothamist, details available at: https://gothamist.com/food/nyc-wins-legal-battle-to-ban-single-use-styrofoam-in-2019 Accessed October 2020.

[649] 'NYC Foam Ban', published by the Manhattan Solid Waste Advisory Board, details available at: https://www.manhattanswab.org/nyc-foam-ban October 2020. Accessed November 2020.

[650] 'Is the 30-year long Styrofoam War nearing its end?', by Katherine Martinelli, published by JSTOR Daily, 09 October 2018, details available at: https://daily.jstor.org/is-the-30-year-long-styrofoam-war-nearing-its-end/ Accessed December 2020.

[651] LL-2019-7, published by the Westchester County Board of Legislators, available at: http://westchestercountyny.iqm2.com/Citizens/Detail_LegiFile.aspx?MeetingID=5260&ID=11613

H.3.2.24 North Carolina

There is an NGO working[652] across the State called Every Tray Counts focusing on working with schools to reduce their food and other waste. One of their primary functions is to eliminate polystyrene single-use trays. Polystyrene is referred to as "commonly known as Styrofoam" in the blog post.

H.3.2.25 Ohio

At State level in 2019, there was a Bill[653] brought before both legislative houses in Ohio which would have prohibited local governments from introducing local laws which would ban EPS/XPS products and other single-use plastic items such as bags. Ultimately the Bill failed to be passed.

The City Council of Oxford voted[654] in February 2020 to introduce a programme that would see the phasing out of polystyrene containers over a two-year timeframe. There are references to the litter problem caused by single-use plastic items and their inability to breakdown or decompose in the environment. Styrofoam™ is again referred to (erroneously) in the article.

H.3.2.26 Oklahoma

A Bill[655] was passed by the State legislature in 2019 that prohibits local municipal governments from instituting bans on a number of single-use items including "auxiliary containers". The text definition covers cups, packages and containers made from plastic, including foamed or expanded plastic.

H.3.2.27 Oregon

A number of local bans have been implemented in the state, including one of the earliest such actions.

H.3.2.27.1 Oregon – Ashland

Since June 2020, in the city of Ashland the disposal polystyrene foam in landfill and as litter has been declared a "nuisance", officially. An Ordinance[656] in the Municipal Code refers to polystyrene foam (PSF) and it bans the use of packaging made from such material if certain CFCs are used in the production of same. The ban is in place for nearly all food types, although meat is excluded. There is a full ban on PSF products being used for takeaway purposes and PSF products can only be used in-house if there is a method for recycling the containers on-site.

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[652] 'Environmental advocates: We've had it up to here with (literally) polluting polystyrene', by Rob Schofield, published by NC Policy Watch, 08 June 2018, details available at: http://pulse.ncpolicywatch.org/2018/06/08/environmental-advocates-weve-had-it-up-to-here-literally-with-polluting-polystyrene/#sthash.qiClw5sL.dpbs Accessed November 2020.

[653] 'Plastic Bag and Container Fee Preemption Bills die in Ohio Legislature', published by Surfrider Foundation, 01 March 2019, details available at: https://www.surfrider.org/coastal-blog/entry/pro-litter-plastic-bag-and-container-fee-preemption-bills-die-in-ohio-legis Accessed November 2020.

[654] 'Oxford City Council votes to eliminate polystyrene usage', by Casey Brosakos, published by the Oxford Observer, 07 February 2020, details available at: https://oxfordobserver.org/1384/business/oxford-city-council-votes-to-eliminate-polystyrene-usage/ Accessed November 2020.

[655] An Act, Enrolled Senate State Bill 1001, published by Legiscan, available at: https://legiscan.com/OK/text/SB1001/2019

[656] Chapter 9.20 Nuisance – Polystyrene Foam, published by the City of Ashland, available at: https://ashland.municipal.codes/AMC/9.20.050

A PSF Task Force was formed per the Ordinance with the objectives of educating people about the ban and undertaking research into alternative products.

H.3.2.27.2 Oregon – Pacific University

The Pacific University of Oregon in May 2020 decided[657] to introduce a campus-wide policy to halt the purchase of "expanded polystyrene, more commonly known as Styrofoam, food containers". The policy also supports the use of containers made from post-consumer waste.

H.3.2.27.3 Oregon – Portland

Since January 1990, the City of Portland has had an Ordinance[658] included in its Municipal Code, which banned the service of prepared food in a PSF container. This followed the appointment of a Task Force[659] which was formed to recommend policies on the sale and use of such products. On its website[660], the city refers to the ban on serving or packaging food in products made from PSF. It then goes on to state that "polystyrene is often called Styrofoam but there are many brands of these foam containers, all of which are included in this ban".

It should be noted that at the time of the introduction of the legislation, the fast-food chain, McDonald's, challenged the legislation through the judicial system. Having lost its court case, McDonald's decided[661] to remove EPS clamshell containers from its entire network of restaurants across the US.

An attempt to pass a Bill that would have seen the introduction of a State-wide ban on the use of food containers, "made from plastic foam commonly known as Styrofoam", was defeated[662] in the lower legislative house in April 2019. The Bill was opposed by a number of representatives, some of whom referenced the existence of the polystyrene recycling facility in the State and supported more recycling initiatives.

H.3.2.28 Pennsylvania

A representative has introduced[663] two Bills to the state's lower house which would ban the use of plastic foam containers by restaurant and shops. The first bill in 2019 was rejected. The second bill

[657] 'Pacific approves Styrofoam ban', by Carrie Malone, published by the Pacific University, Oregon, 27 May 2020, details available at: https://www.pacificu.edu/about/media/pacific-approves-styrofoam-ban Accessed December 2020.
[658] Chapter 17.103Prohibition and Restrictions on Single-Use Plastics, published by the City of Portland, available at: https://www.portlandoregon.gov/citycode/56750
[659] An Assessment of Policies on Polystyrene Food Ware Bans, by Linda D. Nguyen, San Jose State University, published by SJSU ScholarWorks, Fall 2012, available at: https://scholarworks.sjsu.edu/cgi/viewcontent.cgi?article=1265&context=etd_projects
[660] Polystyrene Foam Container Ban, City of Portland website, available at: https://www.portland.gov/bps/garbage-recycling/business-garbage-and-recycling-policies/polystyrene-container-ban
[661] 'An Assessment of Policies on Polystyrene Food Ware Bans' by Linda D. Nguyen, Masters Projects 266, available at: https://scholarworks.sjsu.edu/cgi/viewcontent.cgi?article=1265&context=etd_projects
[662] 'On Earth Day, Oregon House shoots down proposed plastic foam ban', by Dirk VanderHart, published by OPB, 22 April 2019, details available at: https://www.opb.org/news/article/oregon-plastic-foam-ban-fails-styrofoam-polystyrene/ Accessed November 2020.
[663] 'Could Pennsylvania be next state to ban foam takeout containers?', by Shelley Stallsmith, published by the York Daily Record, no date, details available at: https://eu.ydr.com/story/news/2019/03/20/could-pennsylvania-next-state-ban-foam-takeout-containers/3225606002/ Accessed December 2020.

proposed in 2020 was forwarded to the committee on environmental resources and energy. It is not clear if the Bill has progressed to the upper house of the state legislature.

H.3.2.29 Rhode Island

In the town of Barrington, an Ordinance[664] was introduced in 2019, which saw a ban on the sale, distribution and use of all polystyrene food and beverage containers, and specifies those items which are marked with the 1 (PET), 3 (PVC) or 6 (PS) recycling symbols, are made from expanded polystyrene or are packing materials. The purpose of the law is to tackle the litter caused by discarding of such items and it took effect from July 2019 for all retailers and from January 2020 for everyone else. There is a preference for items which are reusable, for dining in, recyclable or compostable.

H.3.2.30 South Carolina

H.3.2.30.1 South Carolina – Charleston

In this, the largest city in the state, a ban on a number of single-use plastic items, including "foam containers" was narrowly voted[665] through by its City Council in November 2018. There were concerns raised that the ban did not focus attention on the actual problem, of littering, but was approved nonetheless. The law was due to take effect on 01 January 2020.

H.3.2.30.2 South Carolina – Isle of Palms

In 2019, an Ordinance[666] which banned a number of single-use plastic items was passed. It includes "polystyrene/plastic foam products (also called Styrofoam)". Among the items described are cups, bowls, clamshells, coolers, ice chests and any other product containing polystyrene/plastic foam that is not completely encased in another more durable material. Trays used for meat and poultry are exempted.

The ordinance also requires that disposable food service containers must be either recyclable or compostable.

H.3.2.31 South Dakota

A Bill[667] which prevents city and town council from introducing local ordinances to restrict or ban "auxiliary containers… including foamed or expanded plastic…" was passed by both houses in South Dakota and approved in March 2020.

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[664] Ordinance No. 2019-5, Town of Barrington, available at: https://a3be8f1b-8cc6-4cd6-a2c4-d87a5ae2878d.filesusr.com/ugd/ba1eb5_c485784a294b42f481f36be58ac48a89.pdf

[665] 'Charleston bans plastic bags, straws and foam – but hesitantly', by Abigail Darlington, published by the Post and Courier, 27 November 2018, details available at: https://www.postandcourier.com/news/charleston-bans-plastic-bags-straws-and-foam-but-hesitantly/article_408e4610-f1c7-11e8-b409-1b99081bb7f9.html Accessed November 2020.

[666] Single-Use plastic bags, polystyrene/plastic foam products & plastic straws ban, published by the City of the Isle of Palms, available at: https://www.iop.net/news/single-use-plastic-bags-polystyreneplastic-foam-products-plastic-straws-ban

[667] Senate Bill 54, published by South Dakota Legislature, available at: https://sdlegislature.gov/Session/Bill/11557

H.3.2.32 Texas

In what may have been the first legislation of its kind, the Texas legislature passed a law in 1991 that prohibited cities from passing "Styrofoam" bans. In the article[668] carried on the website of a NGO, it states that "polystyrene is essentially just another word for Styrofoam".

H.3.2.33 Utah

A Bill, which contained very similar text to those laws in both Oklahoma and South Dakota (see above), did not make it through both houses in Utah. The Container Regulation Act[669] was introduced to the floor in February 2020 and also referred to an "auxiliary container" and materials included "plastic, including foamed plastic or expanded plastic and …expanded polystyrene". The Act would have prevented any local government entity from implementing a ban or restriction on these containers.

H.3.2.34 Vermont

A state-wide law[670] was passed in 2019 which prohibits the sale, distribution and use of a number of single-use plastic items and includes products made from expanded polystyrene such as containers, plates and clamshells. The primary objectives of the law are to "mitigate the harmful effects of single-use products on Vermont's municipalities and natural resources" and reduce the volume of such products being disposed of in landfill.

The law also introduces a requirement for the set-up of a Single-Use Products Working Group, which is to comprise representatives of businesses, the waste management industry and environmental NGOs, among others. Its functions are to include:

- Evaluating the success of State and municipal efforts to manage single-use products, including a life-cycle analysis of each product from its manufacture to its ultimate disposal;
- Evaluating the effect on landfill capacity of those items which are disposed of but could be recycled;
- Recommending mechanisms by which single-use products could be better managed, including the consideration of an EPR scheme.

The law came into effect from 01 July 2020. Products used for the packaging of raw, unprepared meat and fish are excluded from the ban.

[668] 'Could Texas be getting a Styrofoam ban?', by Amy Stansbury, published by the Austin Common, 08 June 2018, details available at: https://theaustincommon.com/could-texas-be-getting-a-styrofoam-ban/ Accessed January 2021.
[669] Container Regulation Act, published by the Utah State Legislature, available at: https://le.utah.gov/~2019/bills/static/HB0320.html
[670] No. 69. An Act relating to the management of single-use products, published by the State of Vermont, available at: https://dec.vermont.gov/content/single-use-products-law

H.3.2.35 Virginia

A Bill[671], which would have seen the introduction of a two-phase ban on the use of plastic foam containers, is effectively in limbo in the State legislature. While it passed through the lower house in 2020, an amendment which was proposed by a senator in the upper house, resulted in the Bill being referred to a committee. If approved it would prohibit the use of certain items, including plates and take-out containers, by fast food chains from July 2023 and all other vendors by July 2025.

H.3.2.36 Washington

In a similar situation to Virginia (see above) a Bill[672] has passed through certain stages of the legislative process but does not appear to have been enacted. "SB6213 - 2019-2020 Concerning certain expanded polystyrene products" was approved by the lower house in March 2020. In contrast to other municipal and state legislation, this law was written having regard to a recycling development centre in the state. If approved it would prohibit the sale and supply of food service products such as plates, beverage cups and clam-shell containers made from expanded polystyrene.

In a press release[673] issued at the time, the Bill's sponsor stated that "Styrofoam is a toxic material that we simply cannot reuse or recycle".

H.3.2.37 Washington D.C.

Since 2014, there has been a ban[674] in place on the use of disposable food service ware made of expanded polystyrene "commonly known as foam or Styrofoam™…." There is also a requirement for all disposable food service ware to be either compostable or recyclable, since 2017. Products added to the banned list, with effect from January 2021, are foam storage containers such as coolers and loose-fill packing material, referred to as packing "peanuts".

The Department of Energy & Environment reports[675] that in the time since the initial ban was implemented, the cumulative proportion of rubbish comprising foam products, found in the main river in DC, has dropped from 18% of the overall total to 5%.

H.1.4.38 Wisconsin

In Milwaukee, there is a city-sponsored programme called the Lake Friendly Movement[676], where businesses are encouraged to collaborate and reduce their use of single-use products. One of the

[671] 'Split over Bill banning plastic foam to-go containers', by AP, published by US News, 02 March 2020, details available at: https://www.usnews.com/news/best-states/virginia/articles/2020-03-02/split-over-bill-banning-plastic-foam-to-go-containers Accessed December 2020.
[672] SB 6213 – 2019-2020, published by Washington State Legislature, available at: https://app.leg.wa.gov/billsummary?BillNumber=6213&Year=2019&Initiative=False
[673] 'State Senate passes Bill banning most Styrofoam-type products', published by the Kent Reporter, 18 February 2020, details available at: https://www.kentreporter.com/news/state-senate-passes-bill-banning-most-styrofoam-type-products/ Accessed November 2020.
[674] Foam Free DC, published by the Department of Energy & Environment, available at: https://doee.dc.gov/node/1504666
[675] What impact has the Foam ban had?, published by the Department of Energy & Environment, available at: https://doee.dc.gov/node/1504666#What%20is%20the%20purpose%20of%20the%20law?
[676] Join the Lake Friendly Movement, published by the Environmental Collaboration Office, City of Milwaukee, available at: https://city.milwaukee.gov/Lake-Friendly.htm

certification requirements is “No Styrofoam: EPS foam…. used for inexpensive, disposable products (such as cups, plates, clamshells etc)….”.

APPENDIX J - CARIBBEAN REGION

Figure 29. Map of Caribbean region and Central America

J.1 Anguilla *(British Overseas Territory, population 15,000)*

According to the Minutes[677] of a meeting of the Anguilla Executive Council in September 2018, the Council, among other related items, agreed a date for the total phase out of "the importation and use of single use plastic shopping bags, Styrofoam (polystyrene) containers and single use plastic containers" by March 2019. In November 2018 a press release in the local newspaper[678] stated that the government of Anguilla would develop a national plan to prohibit certain single use plastics, including "single use plastic shopping bags, single use utensils and polystyrene foam containers, commonly referred to as Styrofoam containers on Anguilla".

J.2 Antigua & Barbuda *(population 97,000)*

A local website called Health Watch Antigua and Barbuda reported[679] in 2017 that a ban on Styrofoam™ food service products would be implemented in three stages, commencing on 01 July 2017, making it one of the earliest bans on EPS/XPS products in the region. However, the legislation which references EPS is dated 2019. The references in the Litter Control and Prevention Act, 2019[680] are very comprehensive albeit using EPS and Styrofoam™ interchangeably: ""banned products"

[677] Minutes of the 159th Meeting of the Eleventh Anguilla Executive Council held on Thursday 27th September 2018, available at: http://www.gov.ai/documents/exco/Mn18-159.pdf Accessed October 2020.
[678] 'Anguilla joins region's governments banning plastic', published 26 November 2018 by the Anguillian, available at: https://theanguillian.com/2018/11/anguilla-joins-regions-governments-banning-plastic/ Accessed October 2020.
[679] 'Styrofoam Ban Cheat Sheet', published 2017(?) by Health Watch Antigua and Barbuda, available at: http://www.healthwatchantiguaandbarbuda.com/styrofoam-ban-cheat-sheet Accessed October 2020.
[680] The Litter Control and Prevention Act, 2019, No. 3 of 2019, (published in the Official Gazette Vol. XXXIX No. 20, dated 18th April 2019), available at: http://laws.gov.ag/wp-content/uploads/2019/05/No.-3-of-2019-LITTER-CONTROL-AND-PREVENTION-ACT-2019-No.-3-of-2019.pdf Accessed October 2020.

means expanded polystyrene (Styrofoam) to include food service containers, including bowls, plates, hot and cold beverages cups…clamshell, hinge lids….meat trays and fruit trays…..and any other products made of Expanded Polystyrene used for selling, holding or providing food for consumption on or off the premises".
The Act also describes "expanded polystyrene (Styrofoam) means blown polystyrene and expanded and extruded foams which are thermoplastic petrochemical materials utilizing a styrene monomer and processed by any number of techniques including, but not limited to, fusion of polymer sphere (expanded bead polystyrene) injection moulding, foam moulding, and extrusion blow-moulding (extruded foam polystyrene)". By using this language it would appear to include both EPS and XPS – derived products in the ban.

J.3 Aruba *(population 106,000)*

Following the success of the introduction of a single use plastic bag ban in 2017, a Plastic Ban Ordinance became effective[681] in July 2020, which bans the import, manufacture, sale or offer of "….single use plastic/styrofoam cutlery, single use plastic/styrofoam containers used for immediate consumption like fast food containers/food trucks…". Exempted from the ban are Styrofoam trays used for cold cuts and meats.

J.4 Barbados *(population 287,000)*

The government announced[682] a ban on the importation of a wide range of single use plastic products, including "…..egg trays (plastics and Styrofoam) and Styrofoam containers used in the culinary retail industry…" with effect from 01 April 2019. The ban on the sale or distribution of such items followed on 01 July 2019. The FAQ document released at the same time noted however, that poultry producers were to be given more time to find alternative material(s) to the Styrofoam trays they use to package chickens. The actual legislation does not reference EPS, XPS or Styrofoam™. The "Control of Disposable Plastics Act 2019-11"[683] references among other items "single use plastic containers made of plastic or polystyrene: cups, food containers, egg trays, plates or polystyrene containers used in the culinary retail industry…" Under the First Schedule of the Act, there is an exemption for:

1. A disposable polystyrene container or item for pharmaceutical dispensing or any other medical use;
2. A tray made of polystyrene used for the packaging of fresh meat.

A government-based helpline is available for people with queries relating to the ban.

[681] 'Don't forget: the Plastic Ban Ordinance for Aruba will go into effect as of July 1st', published by Aruba Today, available at: https://www.arubatoday.com/dont-forget-the-plastic-ban-ordinance-for-aruba-will-go-into-effect-as-of-july-1st-2/ Accessed October 2020.
[682] Barbados Announces Plastic Ban from April 01, by Julia Rawlins-Bethin, published 22 January 2019, Government Information Service, available at: https://gisbarbados.gov.bb/blog/barbados-announces-plastics-ban-from-april-1/ Accessed October 2020.
[683] 'Control of Disposable Plastics Act 2019-11', published 29 March 2019, available at: https://www.barbadosparliament.com/uploads/document/8dfda40c3ffafeb35aaae98691f50536.pdf Accessed 2020.

J.5 Bermuda *(British Overseas Territory, population 64,000)*

In his Throne Speech of 2018[684], the Governor announced that single-use plastics would be "eliminated" by 2022, with a charge on single-use plastics to be introduced in 2020. It was reported[685] in May 2019 that the government was consulting with community groups while drafting the legislation to phase out single-use plastics. Straws are the only specific items referenced to date.

J.6 British Virgin Islands *(British Overseas Territory, population 30,000)*

It was reported[686] in November 2018 that the government had agreed to a policy which would allow a range of actions including the introduction of a levy on plastic water bottles and "prohibit food and drink containers made of non-compostable plastics including Styrofoam…."

In June 2019, it was further reported[687] that the Minister for Health and Social Development would bring legislation to the Assembly that would include a ban on "Styrofoam and single-use plastics". The same article stated that the Cabinet had previously agreed to prohibit "food and drink containers made of non-compostable plastics including Styrofoam...." . At the same Cabinet meeting it was also agreed that an exemption from import duties for a period of time be extended to "biodegradable, eco-friendly alternative products".

J.7 Cayman Islands *(British Overseas Territory, population 65,000)*

In February 2020 it was reported[688] that a Single-Use Plastics stakeholder committee, formed in 2019, had recommended the introduction of legislation to ban certain single use plastic products, including polystyrene takeaway food containers. The article went on to indicate that a public consultation process was to follow.

J.8 Curaçao *(population 157,000)*

It was reported[689] in October 2020 that the Island Council had approved an ordinance which will ban certain single-use items from 2021; plastic bags are banned from 01 January and plastic food containers with effect from October 2021. The article states that restaurant owners needed more time to find alternatives before "fully eliminating the plastics and Styrofoam containers".

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[684] 'Full Text & Highlights: 2018 Throne Speech', published by Ber News, 09 November 2018, details available at: http://bernews.com/2018/11/full-text-highlights-2018-throne-speech/ Accessed December 2020.

[685] 'Roban: think twice on single-use plastics', by Owain Johnston-Barnes, published by the Royal Gazette, 30 May 2019, details available at: https://www.royalgazette.com/environment/news/article/20190523/roban-think-twice-on-single-use-plastics/ Accessed December 2020.

[686] 'Cabinet approves Styrofoam, plastics ban', by Freeman Rogers, published by the BVI Beacon on 29 November 2018, available at: https://www.bvibeacon.com/cabinet-approves-styrofoam-plastic-ban/ Accessed October 2020.

[687] 'Legislation to ban Styrofoam & single-use plastics - Hon Malone', published by Virgin Islands News Online, 26 June 2019, details available at: http://www.virginislandsnewsonline.com/en/news/legislation-coming-to-ban-styrofoam-single-use-plastics-hon-malone- Accessed December 2020.

[688] 'Committee recommends plastics ban by Jan 2021', by Reshma Ragoonath, published by Cayman Compass 21 February 2020, available at: https://www.caymancompass.com/2020/02/21/committee-recommends-plastics-ban-by-jan-2021/ Accessed October 2020.

[689] 'Island Council of Saba approves ordinance to ban single-use plastic', published by the Curaçao Chronicle, 27 October 2020, details available at: https://www.curacaochronicle.com/post/local/island-council-of-saba-approves-ordinance-to-ban-single-use-plastic/ Accessed December 2020.

J.9 Dominica *(population 72,000)*

The island nation of the Commonwealth of Dominica, badly affected by Hurricane Maria in 2017,[690] is planning to become the first climate resilient nation. As part of its vision, the government announced a ban[691] on the use of single use plastics and Styrofoam™ used in the food service industry with effect from 01 January 2019. The ban includes a number of items including "….single use Styrofoam/Plastic Containers…" with a six-month time span to phase out the banned items.

J.10 Grenada *(population 112,000)*

The government of Grenada took at two-step approach to its legislation. The first ban[692] was on the importation of Styrofoam™ into Grenada which took effect from 01 September 2018, with a second phase of implementation, which banned the sale of food in or with Styrofoam products from 01 March 2019. The Minister with responsibility for the ban and its implementation stated the importance of a consultative process with all stakeholders and indicated that many businesses had already transitioned to alternative materials.

Interestingly, the ban followed lobbying[693] by the Grenada Hotel & Tourism Association to ban both the importation of Styrofoam™ products and their use in the country.

J.11 Haiti *(population 11.2 million)*

It was reported[694] back in 2012 that the government of Haiti was introducing a ban on plastic bags and polystyrene foam cups, plates, trays and other containers because of the litter issues that such items were causing. A local newspaper reported[695] in August 2012 that Presidential Order dated August 9, 2012 stated "it is strictly forbidden to manufacture, import, market and use in any manner whatsoever objects in expanded polystyrene (EPS or PS crystal or Styrofoam) to single use and food, such as trays, cups bottles and plates". The order was due to come into effect from 01 October 2012. A further report[696] in the Haiti Libre newspaper in 2013 states that a more recent Order, dated 2013, demonstrates the commitment of the Government "…to promote a culture of recycling and use of biodegradable products that protect the environment".

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690 'Hurricane Maria devastates Dominica: PM', 19 September 2017, BBC News, available at: https://www.bbc.com/news/world-latin-america-41317164 Accessed October 2020.

691 'Zero Percent Duty on the importation of reusable shopping bags with immediate effect', published 06 December 2018, Dominica Government Information Service, available at: http://news.gov.dm/news/4629-zero-percent-duty-on-the-importation-of-reusable-shopping-bags-with-immediate-effect Accessed October 2020.

692 'It's now illegal to import Styrofoam into Grenada', published 05 September 2018, Ministry of Climate Resilience, the Environment, Forestry, Fisheries & Disaster Management, available at: https://www.gov.gd/mocr/its-now-illegal-import-styrofoam-grenada Accessed October 2020.

693 'The GHTA is concerned about the use of Styrofoam in Grenada', published 18 December 2017, available at: http://ghta.org/members/news/the-ghta-is-concerned-about-the-use-of-styrofoam-in-grenada Accessed October 2020.

694 'Haiti bans plastics bags and Styrofoam containers', by Jacqueline Charles and Curtis Morgan, McClatchy, available at: https://www.csmonitor.com/World/Americas/2012/0928/Haiti-bans-plastic-bags-and-styrofoam-containers Accessed October 2020.

695 'Haiti – Environment – Measures of protection for the Environment', published 16 August 2012 by Haiti Libre, available at: https://www.haitilibre.com/en/news-6395-haiti-environment-measures-of-protection-for-the-environment.html accessed October 2020.

696 'Haiti – NOTICE: Ban on plastic bags and styrofoam', published 12 July 2013, available at: https://www.haitilibre.com/en/news-8995-haiti-notice-ban-on-plastic-bags-and-styrofoam.html Accessed October 2020.

Five years after the initial ban was introduced, it was reported[697] that the situation regarding the availability of foamed polystyrenes was virtually unchanged. The various government Ministries announced that the government formally prohibited the import, manufacture and marketing of these products, with effect from 13 June 2017 and actively encouraged the import of biodegradable alternatives.

It was not possible to determine if the ban has been actively implemented and monitored.

J.12 Jamaica *(population 2.9 million)*

The government of Jamaica also took at two-stage approach to its ban on expanded polystyrene foam products. From January 2019, the importation and sale of a number of single use plastic items, including expanded polystyrene foam products, was prohibited under the Trade (Plastic Packaging Materials Prohibition) Order 2018[698]. The Government announced[699] in December 2019 that the ban on the local manufacture and distribution of expanded polystyrene foam products would be implemented as planned on 01 January 2020, given the success of the initial legislation.
The government provides a dedicated telephone helpline and email address to receive 'comments, recommendations and queries on the ban'. There are fines in place for businesses which are found to have breached the ban.

It should be noted that several newspaper articles relating to the introduction of the ban mention Styrofoam™ even though it is not referenced specifically in the legislation.

J.13 Montserrat *(British Overseas Territory, population 6,000)*

In February 2019 a local newspaper reported[700] that Montserrat was on the way to banning "single-use plastic bags and Styrofoam" by 2020. The article indicated that consultation with the Attorney General and other stakeholders would take place with a view to phasing out single-use plastic bags and Styrofoam. However, as no other term is used it is not clear what specific Styrofoam items are being targeted.

[697] 'iciHaiti – Environment: 5 years of ineffective fight against polystyrene and Styrofoam products, published 16 June 2017 on iciHaiti.com, available at: https://www.icihaiti.com/en/news-21244-icihaiti-environment-5-years-of-ineffective-fight-against-polystyrene-and-styrofoam-products.html Accessed October 2020.
[698] The Trade Act, Trade (Plastic Packaging Materials Prohibition) Order 2018, published 24 December 2018, available at: https://www.nepa.gov.jm/new/legal_matters/laws/Environmental_Laws/Proc_1_Trade_Act.pdf Accessed October 2020.
[699] 'Government Maintaining Ban on Expanded Polystyrene Foam Product', press release 6 December 2019, available at: https://megjc.gov.jm/press-release/ Accessed October 2020.
[700] 'Single use plastics and Styrofoam phase out', published by Alliouagana Express News, 05 February 2019, details available at: https://allixpnews.wixsite.com/alliouaganaexpress/post/single-use-plastics-and-styrofoam-phase-out Accessed December 2020.

J.14 Saint Lucia *(population 187,000)*

The government here announced[701] a ban on the importation of 'foam and plastics food service containers" in April 2019 that was to take effect two months later. The full statement [702]by the Minister of Education, Innovation, Gender Relations and Sustainable Development references Polystyrene, Expanded Polystyrene and Styrofoam® and notes that the ban is being introduced for both public health and environmental reasons. The ban was rolled out with a transition phase of one year, with use of such containers completely prohibited by 31 May 2020.

J.15 Saint Kitts and Nevis *(population 52,800)*

While it has been reportedly considered by the government[703], there appears to be no definitive ban on EPS and/or XPS products.

J.16 St Maarten *(population 40,700)*

The Nature Foundation has been lobbying the government for some time to implement a ban on several single use plastic products, including Styrofoam™, and presented a collaborative letter[704] to a Member of Parliament in March 2020 in support of proposed legislation.

J.17 Saint Vincent & the Grenadines *(population 110,000)*

In 2017, the government of Saint Vincent & the Grenadines published Environmental Health (Expanded Polystyrene Ban) Regulations 2017[705] which prohibited both the import and sale of expanded polystyrene food service products. The object of the legislation[706] was twofold:

- To ban the importation, manufacture, sale and provision of EPS food service products including containers, plates, hot and cold beverage cups, fish, seafood meat and vegetable trays, egg cartons and other products made of expanded polystyrene, and
- To promote and encourage the use of biodegradable, recyclable, and other environmentally friendly containers or packaging for food in lieu of expanded polystyrene products.

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[701] 'Saint Lucia to ban polystyrene, plastics', published 18 April 2019 by the Government of Saint Lucia, available here: http://www.govt.lc/news/saint-lucia-to-ban-polystyrene-plastics Accessed October 2020

[702] Statement by the Minster for Education, Innovation, Gender Relations and Sustainable Development on the control of plastics and Styrofoam® containers, available at: http://www.govt.lc/media.govt.lc/www/pressroom/news/attachments/statement-by-the-minister-on-styrofoam-ban.pdf Accessed October 2020.

[703] 'St Kitts & Nevis: Total ban on single use plastic could take 5 years', by Dionna Baptiste, published 20 December 2019 by Loop, available at: https://www.looptt.com/content/st-kitts-nevis-total-ban-single-use-plastic-could-take-5-years Accessed October 2020.

[704] 'Saint Maarten's Environmental Non-Governmental Organisations present support letter to Parliament for the ban on Single-Use Plastic Items initiated by MP Sarah Westcott-Williams, posted 16 March 2020, available at: https://naturefoundationsxm.org/2020/03/16/st-maartens-environmental-non-governmental-organizations-present-support-letter-to-parliament-for-the-ban-on-single-use-plastic-items-initiated-by-mp-sarah-wescot-williams/ Accessed October 2020.

[705] Public Notice - Environmental Health (Expanded Polystyrene) Ban/Prohibition, available at: http://customs.gov.vc/downloads/ProhibitionStyrofoam.pdf Accessed October 2020.

[706] Saint Vincent and the Grenadines, Statutory Rules and Orders 2017 No. 21, available at: http://asycudaw.svgcustoms.net/downloads/polystreneACT.pdf Accessed October 2020.

While the legislation refers to expanded polystyrene throughout, its definition of expanded polystyrene is "...blown polystyrene and expanded and extruded foams…" which means that XPS products are intended to be included in the ban. There are fines in place for businesses which are found to have breached the ban.

There appears to have been at least one Government-hosted stakeholder meeting[707] since the start of the ban, which took place in January 2018. The invitees included importers, distributors and food outlets and they were asked to discuss "any issues emanating from the ban". Interestingly, despite no reference to it in the legislation, the meeting is referred to as "Styrofoam™ Ban Stakeholders Meeting".

According to an interview[708] on a local TV station, a Trade Officer, Ms John-Patrick from the Ministry of Foreign Affairs, Trade & Commerce, stated that the reason for the ban was two-fold:

1. For environmental reasons, to reduce the amount of these items found as litter, and
2. For health reasons, due to research (not cited) that indicated that use of Styrofoam™ could lead to cancer.

Ms John-Patrick stated that a public awareness campaign would continue to educate both the public and businesses about the ban and why it is being implemented. She also referenced a Committee, made up of representatives from a number of government ministries, which would continue to oversee the implementation of the ban.

The Expanded Polystyrene (Styrofoam) Ban update from the Ministry of Economic Planning, Sustainable Development, Industry, Information and Labour, which is published[709] on the UN Ocean Conference website, indicated that a progress report would be due in May 2018, but to date, no report has been published.

J.18 The Bahamas *(population 389,000)*

Following the creation of a Taskforce[710] (date unknown) which included a number of government ministries, business associations and environmental NGOs, the parliament of the Bahamas enacted the Environmental Protection (Control of Plastic Pollution) Act, 2019 in December 2019. The Act[711] provides definitions as follows:

- "Expanded polystyrene means polystyrene that has been expanded or "blown" using a gaseous blowing agent into a solid foam, and includes polystyrene beads"
- "Polystyrene includes expanded polystyrene that is a thermoplastic petrochemical material, which is a styrene monomer and processed by any number of techniques including, fusion of

[707] 'Styrofoam Ban Stakeholders Meeting', Media Centre, Government of Saint Vincent and the Grenadines, available at: http://www.gov.vc/index.php/media-center/750-styrofoam-ban-stakeholders-meeting Accessed October 2020.
[708] Interview with Okolo John-Patrick & Leslie Millington, on API, available at: https://www.youtube.com/watch?v=lnXQh4ed6kg Accessed October 2020.
[709] 'Expanded Polystyrene (Styrofoam) Ban update', published by the UN Ocean Conference, details available at: https://oceanconference.un.org/commitments/?id=18100 Accessed November 2020.
[710] 'Phasing out of Single-Use Plastics & Styrofoam Food Containers', published by the Government of the Bahamas, available at: https://www.bahamas.gov.bs/wps/portal/public/about%20the%20ban/ Accessed October 2020.
[711] Environmental Protection (Control of Plastics) Act, 2019, published in the Extraordinary Official Gazette, The Bahamas, 20 December 2019, available at: https://www.bahamas.gov.bs/wps/portal/public/gov/government/notices/ Accessed October 2020.

polymer spheres (expanded bead polystyrene) , injection moulding, foam moulding, and extrusion blow-moulding (extruded foam polystyrene)"

- "Single-use plastic food ware means any object made in whole or in part from plastic that is commonly used to consume, contain, store, separate, serve, or transport any food or drink"

It is prohibited to import, distribute, manufacture, possess, sell, supply or use the items listed in the Schedule which includes single-use plastic food ware; "polystyrene cups" and "polystyrene plates and other similar polystyrene food ware used to contain food". While both EPS and polystyrene are defined under the first section of the Act, it should be noted that EPS, XPS or Styrofoam™ are not referred to in the Schedule.

By 01 July 2020, with the transition period having passed, it was reported[712] that many businesses had relinquished their remaining stocks of single use plastic products to the Department of Environmental Health & Safety for treatment.

J.19 Trinidad & Tobago *(population 1.4 million)*

In the publication 'State of the Marine Environment Trinidad & Tobago – 2016[713]' there is no reference to marine litter data; climate change is recognised as the main threat to Trinidad & Tobago's marine environment. However, the government approved[714] the introduction of a ban, to include "polystyrene foam products such as Styrofoam", with effect from 2019 but the specific legislation could not be located. The prohibition on the importation of such items was delayed to 01 January 2020 with the ban on items made locally coming into effect on 01 June 2020.

It was reported[715] in the Trinidad & Tobago Guardian newspaper that some businesses were not prepared for the ban, with one company cited as returning to the use of plastic containers for food service after it discovered an issue with its compostable alternative. Some compostable products, having been tested on entering the country, were discovered to have high levels of fluorine. According to the article, the European Consumer Organisation (BEUC) states that products made from this chemical can persist in the environment and may accumulate in the body with potentially negative health effects.

The above report was then refuted[716] by the Minister for Planning and Development, the Honourable Camille Robinson-Regis, who pointed to the extensive stakeholder engagement and

[712] 'Banned plastic products stored at New Providence Landfill', by Sloan Smith, published by Eyewitness News 25 September 2020, available at: https://ewnews.com/banned-plastic-products-stored-at-new-providence-landfill Accessed October 2020.
[713] 'State of the Marine Environment Trinidad & Tobago – 2016', published by the Institute of Marine Affairs, available at: https://www.planning.gov.tt/sites/default/files/State%20of%20the%20Marine%20Environment%20%28SOME%29%20Report%202016%20%28IMA%29.pdf Accessed October 2020.
[714] 'Government approves ban of Styrofoam in T&T by 2019' published on the website of the Ministry of Planning and Development, available at: https://www.planning.gov.tt/content/government-approves-ban-styrofoam-tt-2019 Accessed October 2020.
[715] 'Businessmen: Trinidad & Tobago not ready for Styrofoam ban', by Charles Kong Soo, published 14 October 2019, Trinidad & Tobago Guardian, available at: https://www.guardian.co.tt/news/businessmen-tt-not-ready-for-styrofoam-ban-6.2.960017.1beaef6352 Accessed October 2020.
[716] 'Robinson-Regis: Trinidad and Tobago is ready for Styrofoam ban', News Service Government of the Republic of Trinidad and Tobago, available at: http://news.gov.tt/content/robinson-regis-trinidad-and-tobago-ready-styrofoam-ban#.X412b-0o9aU Accessed October 2020.

collaboration that had taken place since 2017 in order to ensure that a suitable mechanism was implemented in order to phase out the use of EPS in the food and beverage industry.

There appears to have been a focus on replacing EPS/Styrofoam™ products with compostable alternatives by a large group of industry stakeholders, who produced a statement[717] on the proposed EPS ban and "eco-friendly" alternatives. They recognise that there could be an opportunity presented by the ban to introduce compostable alternatives that could be treated locally, on the basis that food waste does not need to be separated from compostable materials to be treated. The Government is also encouraging the research of manufacturing compostable alternatives locally by providing funding[718] through two separate programmes.

It should be noted that one 2017 blog post[719], which appears to have been quoted but not referenced in a later publication by the UNEP, states that in Trinidad, 32.95 tonnes of expanded polystyrene (although throughout the rest of the blog post, the author refers to Styrofoam) are "thrown away daily". Given the enormous volume that this tonnage of EPS represents, it would have been helpful for a reference to be provided for the source of this figure. However, this and several other claims in the blog post have no supporting references.

J.20 Turks and Caicos *(British Overseas Territory, population 38,000)*

It was reported[720] shortly after a ban on single use plastic bags was introduced in 2019 that a similar prohibition would follow covering "polystyrene food packaging, takeout containers and cups". The focus of the legislation appears to centre very much on the prevention of littering by these products on the coastlines of both islands and an effort to make Turks and Caicos more climate resilient.

[717] 'Subject: Facts Statement addressing concerns raised on Ban of EPS in Trinidad & Tobago and the use of Eco-Friendly Alternatives', published by I Am Movement, available at: https://iamovement.org/wp-content/uploads/2018/09/Styrofoam-Single-Use-Plastic-and-Compostable-Packaging-Facts-Statement.pdf Accessed October 2020.

[718] 'Minister of Trade and Industry encourages local manufacturing of biodegradable products', News Service Government of the Republic of Trinidad and Tobago, available at: http://news.gov.tt/content/minister-trade-and-industry-encourages-local-manufacturing-biodegradable-products#.X42ez-0o9aU Accessed October 2020.

[719] 'Why Banning Styrofoam Will Improve the Environment', by Dr Ariana Marshall, published by ZME Science, 10 May 2017, details available at: https://www.zmescience.com/ecology/banning-styrofoam-will-improve-environment/ Accessed October 2020.

[720] 'Styrofoam and polystyrene products to be banned soon', by Olivia Rose, published 20 May 2019, Turks and Caicos Weekly News, available at: http://tcweeklynews.com/styrofoam-and-polystyrene-products-to-be-banned-soon-p9670-127.htm Accessed October 2020.

APPENDIX K - CENTRAL AMERICA

K.1 Belize *(population 390,000)*

In August 2019 a local newspaper reported[721] that a proposed ban on single-use plastic products and Styrofoam, which was scheduled to be implemented in April that year, had not yet been enacted. The article states that Belize, at that time, imported 52 million pieces of Styrofoam annually. It's worth noting that the photograph accompanying the article is clearly of an XPS food container as Styrofoam™ is not used in the production of food containers (see elsewhere in report).

The Environmental Protection (Pollution from Plastics) Regulations 2020[722] were published in January 2019 and were signed into law on 14 January 2020. It is a very comprehensive piece of legislation, and outlines restricted products (Schedule I) and those that are prohibited (Schedule II). The regulations restrict or ban the importation, manufacture, sale and possession of the products listed in the Schedules. (See Appendix O for an extract from the regulations).

1. Schedule I contains details of restricted products and includes:
    - "Polymers of styrene – polystyrene and expansible"
2. Schedule II contains details of prohibited products and includes, among other items:
    - Single Use Styrofoam clamshell
    - Single Use Styrofoam food containers
    - Single Use Styrofoam soup containers
    - Single Use Styrofoam plates
    - Single Use Styrofoam cups and lids
    - Single Use Styrofoam and Plastic plates
    - Single Use Plastic and Styrofoam disposable food containers
    - Single Use Plastic and Styrofoam containers

Despite the thoroughness of the legislation, the use of the term Styrofoam™ could create ambiguity.

K.2 Costa Rica *(population 5 million)*

It was reported[723] in June 2019 that, following the introduction of a national strategy to reduce the use of plastic, Costa Rica would introduce legislation to ban "the use of Styrofoam containers". Following the signing of the law in July 2019, a statement[724] was published on the website of the President of Costa Rica. In it, the terms expanded polystyrene, Styrofoam, polyethylene containers

[721] 'Legislation to phase out single-use plastics and Styrofoam in Belize yet to be enacted', published by the San Pedro Sun, 08 August 2019, details available at: https://www.sanpedrosun.com/environment/2019/08/08/legislation-to-phase-out-single-use-plastics-and-styrofoam-in-belize-yet-to-be-enacted/ Accessed October 2020.
[722] Environmental Protection (Pollution from Plastics) Regulations 2020, published by Department of the Environment, available at: https://doe.gov.bz/wp-content/uploads/2020/03/Environmental-Protection-Regulations-2020.pdf
[723] 'Costa Rica has banned Styrofoam, a major win for the environment', by Erica Sanchez et al, published by Global Citizen, 19 June 2019, details available at: https://www.globalcitizen.org/en/content/costa-rica-to-ban-the-use-of-styrofoam-containers/ Accessed October 2020.
[724] 'Law prohibiting the use of Styrofoam signed in Costa Rica', published by the President of Costa Rica, 15 July 2019, details available at: https://www.presidencia.go.cr/comunicados/2019/07/law-prohibiting-the-use-of-stereophone-signed-in-costa-rica/ Accessed December 2020.

and polystyrene products are all used interchangeably. The law, which will come into effect in July 2021, bans the importation and distribution of the aforementioned products. The statement went on to say that the government will assist those industries which operate in the importation and/or manufacture of packages and containers of expanded polystyrene in the development of more "environmentally friendly alternatives". The Minister of Environment and Energy referenced the protection of natural capital while the Minister for Health spoke about the limited waste management alternatives for expanded polystyrene. The use of styrene was also cited and the statement noted health concerns with the use of styrene in food packaging.

Shortly after the publication of the statement, an article[725] carried on a Central American website stated some businesses were concerned about the much greater cost involved in purchasing alternatives to those to be banned under the new law.

K.3 El Salvador *(population 6.45 million)*

While it was reported[726] in 2019 that the main opposition party in parliament had indicated it would support proposed single-use plastics ban legislation, it appears there have been no developments since. As El Salvador is the second-largest plastics supplier of plastics products in Central America[727] (after the US) it is possible that both politically and economically, any proposal to limit or ban the use of plastic products in the country would be challenged.

K.4 Guatemala *(population 16.6 million)*

While there were no national restrictions in place, one village in Guatemala decided to tackle single-use plastic pollution. In 2016 San Pedro La Laguna, a town on the edge of Lake Atitlán, took the step of banning a number of single-use plastic products including "Styrofoam containers". To encourage the transition, the local government funded[728] the exchange of single-use plastic products for reusable and biodegradable items. Villagers have also returned to using materials, such as banana leaves, which would have been used for food storage before the advent of plastics.

[725] 'Disposable Packaging: More costs, more challenges', published by Central American Data.com, 30 July 2019, details available at: https://en.centralamericadata.com/en/article/home/Disposable_Packaging_More_Costs_New_Challenges Accessed October 2020.
[726] 'The opposition supports the ban on "single-use" plastics in El Salvador', published by Spain's News, 2019, details available at: https://spainsnews.com/the-opposition-supports-the-ban-on-single-use-plastics-in-el-salvador/ Accessed December 2020.
[727] El Salvador – Country Commercial Guide, International Trade Administration, US Department of Commerce, published 30 September 2020, details available at: https://www.trade.gov/knowledge-product/el-salvador-plastics Accessed December 2020.
[728] 'Plastic Ban benefits Guatemalan communities', published by Fresh Cup Magazine, 09 January 2019, details available at: https://www.freshcup.com/plastic-ban-benefits-guatemalan-communities/ Accessed December 2020.

The ban was resisted by a section of the plastics industry which took legal action to try to overturn it[729], but the case was eventually dismissed. As a result of the success of the ban, at least 10 other municipalities have taken steps[730] to introduce similar measures.
Locally, in Guatemala, polystyrene products can be referred to as *duroport.*

Three years later, an analysis of the ban and its effects was carried out – a review of this case study is documented in the Policy Analyses section of the report.

In September 2019 it was announced[731] that national measures were taking shape and a country-wide ban would take effect from 2021. The legislation[732], which comes into force in September 2021, prohibits the use and distribution of a number of items including "…containers for storage and transportation of disposable plastic or expanded polystyrene food (duroport), in its different presentations, shapes and designs". It is possible that as XPS was not referenced in the various regional ordinances which preceded the nation-wide ban, the legislators did not include it. Technically it means that any food containers made from XPS would not fall under the prohibition. However, the legislation also stipulates that anyone who replaces the restricted products with other items, must ensure that the replacement products are made from EU-standard compostable material, under which category XPS products would not fall.

K.5 Honduras *(population 9.74 million)*

There is an NGO, the Summit Foundation, which is sponsoring a programme to tackle plastic pollution on the Mesoamerican Reef. In 2017 they posted[733] an update which gave figures for plastic bag reduction in various parts of Honduras and mentioned that similar bans on "plastic straws, Styrofoam and takeout containers and cups" are expected to follow. However, no evidence of a regional or national ban could be found in the intervening period.

K.6 Panama *(population 4.2 million)*

It was reported[734] in December 2020 that the President of the Republic had signed Law 187 which prohibits a range of single-use plastic items. Article 9[735] prohibits a range of products but there is no

[729] 'Reducing the use of disposable plastic: San Pedro La Laguna, Sololá, Guatemala', published by the GAIA Alliance, January 2020, available at: https://zerowasteworld.org/wp-content/uploads/06-San-Pedro-La-Laguna_Guatemala_English.pdf
[730] 'This town was drowning in plastic. Now it's a model of sustainability.' By Joe McCarthy & Erica Sanchez, published by Global Citizen, 14 February 2019, details available at: https://www.globalcitizen.org/en/content/guatemala-town-plastic-ban-effects/ Accessed November 2020.
[731] 'Guatemala bans use of disposable plastic, sets two-year deadline', published by Reuters, 20 September 2019, details available at: https://www.reuters.com/article/us-guatemala-plastic/guatemala-bans-use-of-disposable-plastic-sets-two-year-deadline-idUSKBN1W5297 Accessed December 2020.
[732] Acuerdo Gubernativo Número 189-2019, El Presidente de la República, Guatemala published 19 September 2019, available at: https://sgp.gob.gt/wp-content/uploads/2019/09/AG-189-2019.pdf
[733] 'Eliminating plastics pollution on the Mesoamerican Reef', published by the Summit Foundation, 17 July 2017, details available at: https://www.summitfdn.org/mesoamerican-reef/eliminating-plastic-pollution-on-the-mesoamerican-reef/ Accessed November 2020.
[734] 'Law enacted to progressively replace single-use plastics in Panama', published by Pana Times, December 2020, details available at: https://panatimes.com/law-enacted-to-progressively-replace-single-use-plastics-in-panama Accessed December 2020.
[735] Ley 187 de 2 diciembre de 2020, published by Gaceta OficialDigital, miércoles 02 diciembre de 2020, available at: https://www.gacetaoficial.gob.pa/pdfTemp/29167_B/82069.pdf

reference to EPS or XPS. One item is disposable plastic plates so it's likely that plates made using EPS or XPS would be covered. That section is due to come into effect on 01 July 2021.

However, one municipality, Bocas Del Toro, took steps[736] to address single-use plastic pollution in early 2018 by banning the use of disposable items, including "Styrofoam cups and plates" for customers dining in restaurants. Their use for takeaway food was allowed to continue until September 2018 when it was announced that this practice was also banned.

[736] 'Bocas says "No!" to even more plastics: the municipality takes out Styrofoam', by Nicholas Korea, published by the Bocas Breeze, 01 September 2018, details available at: http://thebocasbreeze.com/environment/bocas-says-no-to-even-more-plastics-the-municipality-takes-out-styrofoam/ Accessed December 2020.

APPENDIX L - SOUTH AMERICA

Figure 30. Map of South America

L.1 Brazil *(population 211 million)*

As a member of the G20 group of nations, Brazil is a partner to the Implementation Framework for Actions on Marine Litter and its corresponding Osaka Blue Vision. In its most recent update[737] to the G20, dated March 2020, it noted the launch of its National Plan to Combat Marine Litter (formulated in 2019) with its six areas of action.

[737] Brazil update, G20 Towards Osaka Blue Ocean Vision, posted 02 April 2020, available at: https://g20mpl.org/partners/brazil

A research paper[738] published in 2017, which examined the concept of a reverse logistics supply chain for EPS as part of a Circular Economy concept, concluded that the main obstacle faced was the high cost of transportation, due to its low weight but large volume.

As EPS use is widespread in a number of applications, a paper[739] written in 2020 indicated that extensive research was being undertaken across a number of universities to find economically viable ways to recycle EPS. Research efforts included studies on the incorporation of waste EPS into concrete, for use in thermal insulation and even a jewellery collection.

While there appear to be no plans to legislate for the use of single-use plastics at national level, some regions/cities have implemented measures at a local level.

L.1.1 Fernando de Noronha Island

Local authorities in this small archipelago off the coast of the country signed a decree[740] in December 2018 which prohibited the importation, sale, distribution and use of a wide variety of single-use plastic items, including both EPS and XPS packaging and disposable containers.

L.1.2 São Paulo

The Mayor of this city, the most populous in Brazil, enacted[741] a law which saw the introduction of a ban on the use of disposable plastic products by commercial establishments, with effect from January 2021. As products provided to consumers must be biodegradable, compostable or reusable, both EPS and XPS products would be included in the ban.

L.2 Chile *(population 19 million)*

Whilst the country is not a member of the G20, it is a partner to the G20 Towards Osaka Blue Vision. In its most recent update[742] to the G20, dated February 2021, it noted the development of a national marine debris management strategy, targets for the recovery of plastic packaging through EPR and the creation of a Plastics Pact.

Since 2019, Chile has a Plastics Pact[743] in place, in collaboration with the Global Plastics Pact Network which is managed through the Ellen MacArthur Foundation. There are four commitments to which participating organisations are asked to work towards for 2025:

- Eliminating plastic packaging and problematic single-use utensils;
- 100% of plastic containers and packaging to be fully reusable, recyclable or compostable;

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738 'Expanded Polystyrene (EPS) Chain applied to the circular economy concept in Brazil', by C.T. de Oliveira et al, Department of Production Engineering, Federal University of Santa Catarina, 2017, available at: http://uest.ntua.gr/athens2017/proceedings/pdfs/Athens2017_Oliveira_Andrade_Luna_Campos.pdf

739 'Brazil and "Styrofoam" use', by Sheila Vieira PhD, published by AJE Scholar, 2020, available at: https://www.aje.com/arc/brazil-and-styrofoam-reuse/ Accessed December 2020.

740 'Fernando de Noronha island without plastic closer to reality', by Juliana Marinho, published by WWF, 22 December 2018, details available at: https://www.wwf.org.br/?69342/Fernando-de-Noronha-island-without-plastic-gets-closer-to-reality Accessed December 2020.

741 'City of São Paulo bans disposable plastic products', published by Brazilian Plastics, December 2019, details available at: http://www.brazilianplastics.com/edicao00/21_December2019.html Accessed November 2020.

742 Chile update, G20 Towards Osaka Blue Ocean Vision, posted 01 February 2021, available at: https://g20mpl.org/partners/chile

743 'New Plastics Economy – Catalyzing Change through Collaboration', published by Fundación Chile, available at: https://fch.cl/en/initiative/new-plastics-economy/#:~:text=The%20Chilean%20Plastics%20Pact%20(PCP,companies%2C%20public%20sphere%20and%20NGOs.

- A third of all waste packaging to be effectively reused, recycled or composted;
- Plastic packaging and containers to contain an average of 25% recycled material.

In 2019, a bi-partisan Bill was presented[744] in the country's senate which, if enacted, would see the introduction of limits on the use of a range of single-use plastics. Under the Bill, which was aimed at any establishment serving prepared food, all items used for in-house dining would need to be reusable while those for takeaway would have to be made from materials other than plastic, thereby eliminating the use of EPS and XPS products. The article goes on to state that "Styrofoam" would be banned within a year but that other materials would be phased out within three years.

The Senate unanimously approved[745] the bill in July 2020 and it moved on to the lower house for further consideration.

L.3 Colombia *(population 50 million)*

The Caribbean archipelago of San Andrés and Providencia may be home to the first law[746] in Colombia that would see the phasing out of a number of single-use plastic products by 2022, to be replaced by alternatives which must be biodegradable. On this basis both EPS and XPS items would no longer be allowed. The ban would also see the confiscation of items from anyone arriving at the destination by boat.

In a paper[747] written for a conference series, research was carried out under laboratory conditions to test the feasibility of using waste EPS as a constituent of waterproof paint. The authors, mainly based in universities in Colombia, concluded that it would be possible to use end-of-life EPS in this manner but further testing was required.

L.4 Ecuador *(population 17 million)*

In November 2020 it was reported[748] that the National Assembly had approved a bill which will see the phasing out of a broad range of single-use plastic items over a period of three years. In the second year of its implementation, the import, distribution and use of containers and glasses that come from "polystyrene, be it expanded, extruded or foam, for food and beverages for human consumption" will be prohibited. It was declared that the reduction of waste generated by the use of plastic products on the environment and human health is in the national interest.

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[744] 'Oceana, Plastic Oceans Chile and a group of senators from different parties support an ambitious project…', published by Plastic Oceans, 14 May 2019, details available at: https://plasticoceans.org/chile-works-to-eliminate-single-use-plastic/ Accessed December 2020.

[745] 'Chile's plastics industry "knows what's coming"', published by Bnamericas, 01 September 2020, details available at: https://www.bnamericas.com/en/interviews/chiles-plastics-industry-knows-whats-coming Accessed March 2021.

[746] 'Colombia close to banning single-use plastics on Caribbean island province', by Adam Veitch, published by Colombia Reports, 12 June 2019, details available at: https://colombiareports.com/colombia-close-to-banning-single-use-plastics-on-caribbean-island-province/ Accessed November 2020.

[747] 'Effect of expanded polystyrene waste in the creation of waterproofing paint', by Bellon D. et al, Journal of Physics: Conference Series 1386 012075, 2019, available at: https://iopscience.iop.org/article/10.1088/1742-6596/1386/1/012075/pdf Accessed December 2020.

[748] 'National Assembly approves Draft Law that regulates the use and commercialization of single-use plastic products', published by Ecuador Times, 05 November 2020, details available at: https://www.ecuadortimes.net/national-assembly-approves-draft-law-that-regulates-the-use-and-commercialization-of-single-use-plastic-products/ Accessed January 2021.

This move follows the introduction of a similar ban[749] on the famous Galapagos Islands in 2018. "Styrofoam containers for food" were prohibited with effect from July 2018.

L.5 Guyana *(population 783,000)*

This country, situated on the northern part of the continent, was one of the earliest adopters of legislation to restrict the use of expanded polystyrene in the southern hemisphere. In 2015, the government enacted regulations[750] under the Environmental Protection Act and the definitions used for EPS are the same as in many other ordinances. The law prohibits the import, manufacture, sale, distribution and use of expanded polystyrene products by any food service establishment.

On the website[751] of the Environmental Protection Agency of Guyana, the terms EPS and Styrofoam are used interchangeably relating to the legislation and it states that polystyrene contains chemicals which can be harmful to human health if leached into hot foods and beverages. It is also noted that alternatives must be biodegradable or compostable and that other materials are readily available.

L.6 Peru *(population 32.5million)*

In November 2018 a decree[752] that ruled out the use of "Styrofoam" by any public sector organisation was implemented. The same law saw a ban on non-biodegradable plastics (which would include EPS and XPS) being allowed into any national park.

A month later, following a year-long passage, the Congress of Peru voted[753] to introduce a law at national level that would see the regulation of a range of single-use plastic items including EPS packaging. With effect from April 2019, items were prohibited from use in areas classed as vulnerable, such as beaches and protected areas. Within three years (by 2022) the import, manufacture, sale and distribution of a number of items will also be regulated.

[749] 'The Galapagos Islands free of plastic since May 2018', published by Latin Trails, details available at: https://latintrails.com/the-galapagos-islands-free-of-plastic-since-may-2018 Accessed December 2020.
[750] Regulations made under the Environmental Protection Act, dated 10 December 2015, available at: https://parliament.gov.gy/documents/documents-laid/5543-enivornmental_protection_(expanded_polystyrene_ban)_regulations_no._8_of_2015.pdf
[751] Environmental Protection Agency – Guyana, website available at: http://www.epaguyana.org/epa/news/education-awareness/129-styrofoam-ban
[752] 'Peru's public sector to phase out styrofoam, plastic bags and straws', by Michael Krumholtz, published by Peru Reports, 04 November 2018, details available at: https://perureports.com/peru-plastic-bags-ban-public-sector/8642/ Accessed November 2020.
[753] 'Peru's new law trashes single-use plastics', by Sandra Otoya, published by Oceana, 20 December 2018, details available at: https://oceana.org/blog/peru%E2%80%99s-new-law-trashes-single-use-plastics Accessed December 2020.

APPENDIX M - AFRICA

Figure 31. Map of Africa

M.1 Nigeria *(population 201 million)*

As the most populous country in Africa, it's possibly a little surprising that more steps have not been taken to date to address the plastic waste problem. It was reported[754] in October 2020, that the Federal Executive Council has validated a new plastic waste management policy, that it is hoped will lead to an increase in plastics recycling and reuse. However, some environmental NGOs have called[755] for an earlier introduction date for the ban on certain single-use plastic products, including "styrofoam, microbeads and carrier bags which have no economic (recycling) potential". The legislation proposed would see a ban implemented in 2028 but the NGOs want this date brought forward to 2021 for certain items.

The country's packaging institute, Nigeria Packaging[756], makes no reference to EPS or XPS.

[754] 'Nigeria: the FEC approves a new law on plastic waste management', by Inès Magoum, published by Afrik 21, 23 October 2020, details available at: https://www.afrik21.africa/en/nigeria-the-fec-approves-a-new-law-on-plastic-waste-management/#:~:text=In%20Nigeria%2C%20the%20Federal%20Executive,to%20improve%20plastic%20waste%20management.&text=Plastic%20can%20be%20recycled%20to,Federal%20Minister%20of%20the%20Environment. Accessed December 2020.

[755] 'Groups urge federal government to ban single-use plastic in 2021', by Chinedum Uwaegbulam, published by The Guardian, 02 November 2020, details available at: https://guardian.ng/property/groups-urge-federal-government-to-ban-single-use-plastic-in-2021/ Accessed November 2020.

[756] Nigeria Packaging, website available at: https://nigeriapackaging.com/?page_id=862

M.2 Republic of South Africa *(population 58.6 million)*

As a member of the G20 group of nations, South Africa is a partner to the Implementation Framework for Actions on Marine Litter and its corresponding Osaka Blue Vision. In its most recent update[757] to the G20, dated March 2020, it noted its involvement with initiatives such as the Western Indian Ocean Regional Action Plan on Marine Litter and a number of domestic policies to improve waste management and remove litter from land and aquatic systems.
While there appears to be no national legislation in place, some regions are taking action to reduce the use of single-use plastics.

In Durban there is a concerted effort to convince legislators that EPS containers are not required, with its Say No to Expanded Polystyrene Campaign[758]. The campaign argues that the litter caused by the poorly managed disposal of EPS food containers and the potential health issues caused by the use of these containers, particularly for hot, greasy food mean that they should be banned on a legislative basis.

M.3 Rwanda *(population 12.63 million)*

In 2019 the government enacted legislation[759] to prohibit the importation, manufacture, sale, distribution and use of plastic carry bags and single-use plastic items. As the definition of single-use plastics is very broad, "disposable plastic item designed to be used once before it is discarded or recycled", all food service products made from both EPS and XPS would be included in the ban. There was a transitional period of three months during which stocks of products could be used up. Manufacturers in Rwanda had two years during which to cease production or find alternative and acceptable materials under the legislation.

The law also contains an element of EPR insofar as, importers of goods which come packaged in plastic are subject to an environmental levy and importers of single-use plastic items must ensure that they are collected after use and ensure their delivery to recycling plants. It is not clear but this stipulation may only have applied until such time as all stocks of single-use plastic items were exhausted.

M.4 Zimbabwe *(population 14.65 million)*

In 2017, it was reported[760] that the government was set to implement a ban on EPS containers which had actually been legislated for in 2012, but not enacted. The ban was specifically targeted at the use of EPS for food service containers. The Environment Management Agency claimed that as many

[757] South Africa update, G20 Towards Osaka Blue Ocean Vision, posted 17 March 2020, available at: https://g20mpl.org/partners/republicofsouthafrica
[758] Say No to Expanded Polystyrene, published by Durbanites against plastic pollution, available at: https://dpapp.org/get-involved/ban-polystyrene
[759] Law No. 17/2019 of 10/08/2019 relating to the Prohibition of Manufacturing, Importation, Use and Sale of Plastic Carry Bags and Single-Use Plastic Items, published in the Official Gazette, 23/09/2019, available at: https://elaw.org/system/files/attachments/publicresource/Law_relating_to_the_prohibition_of_manufacturing__importation__use_and_sale_of_plastic_carry_bags.pdf
[760] 'Zimbabwe bans plastic foam containers to protect the environment', by Sebastian Mhofu, published by VOA News, 14 July 2017, details available at: https://www.voanews.com/africa/zimbabwe-bans-plastic-foam-containers-protect-environment Accessed November 2020.

waste containers were burnt in the open, in the absence of proper waste management infrastructure, the smoke from such fires could be toxic. The litter caused by the items as waste was also referenced.
EPS is also known as *kaylite*[761] in Zimbabwe.

M.5 Mauritius *(population 1.26 million)*

In 2020 the government notified the World Trade Organisation[762] that restrictions would be implemented regarding the importation and manufacture of both biodegradable and non-biodegradable single-use plastic items. The Ministry of Environment, Solid Waste Management and Climate Change is responsible for the Environment Protection Act. The ban came into effect for domestic use in January 2021 with businesses banned from importing, selling, distributing or using the items from April 2021.

M.6 The Maldives (*population 531,000)*

Whilst the country is not a member of the G20, it is a partner to the G20 Towards Osaka Blue Vision. In its most recent update[763] to the G20, dated February 2021, it noted that a national plan to phase out single-use plastics had been drafted. The plan includes a ban on the importation of certain single-use plastic products, levies, the introduction of EPR, education campaigns and "sustainable provision of alternatives".
Prior to the update provided, the President published[764] a list of single-use plastic items that will be prohibited from being imported into the country with effect from 01 June 2021. The list includes plates (no further details given) and "Styrofoam lunch boxes".

M.7 The Seychelles *(population 97,600)*

The government introduced legislation[765] under its Environment Protection Act 2016 which gave rise to a ban on the importation, sale and distribution of "polystyrene boxes" from 2017 onwards. It defined polystyrene boxes to include takeaway boxes for food.

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[761] 'Cleaning up Zimbabwe with a styrofoam ban', by Columbus Mahvunga, published by DW, 02 October 2017, details available at: https://www.dw.com/en/cleaning-up-zimbabwe-with-a-styrofoam-ban/a-40781948 Accessed January 2021.
[762] Environment Protection (Control of Single Use Plastic Products) Regulations 2020, published by the Government, 09 November 2020, available at: https://chemycal.com/news/bfd5ce9e-3847-4e3c-91df-57d318a2d24b/Mauritius__Environment_Protection_Control_of_Single_use_Plastic_Products_Regulations_2020
[763] The Maldives update, G20 Towards Osaka Blue Ocean Vision, posted 01 February 2021, available at: https://g20mpl.org/partners/republicofmaldives
[764] 'President declares list of Single-Use Plastics prohibited to import from June 1, 2021', press release published by the President's Office, 30 December 2020, details available at: https://presidency.gov.mv/Press/Article/24211 Accessed March 2021.
[765] S.I. of 2017, Environment Protection (Restriction on importation, distribution and sale of Plastic Utensils and Polystyrene Boxes) Regulations 2017, published by the Government, available at: https://members.wto.org/crnattachments/2017/TBT/SYC/17_0650_01_e.pdf

APPENDIX N – Extracts from SUP Directive

further clarify whether a product is to be considered a single-use plastic product for the purposes of this Directive, the Commission should develop guidelines on single-use plastic products. In view of the criteria set out in this Directive, examples of food containers to be considered as single-use plastic products for the purposes of this Directive are fast-food containers or meal, sandwich, wrap and salad boxes with cold or hot food, or food containers of fresh or processed food that does not need further preparation, such as fruits, vegetables or desserts. Examples of food containers that are not to be considered as single-use plastic products for the purposes of this Directive are food containers with dried food or food that is sold cold requiring further preparation, containers containing food in more than single-serve portions or single-serve portion-sized food containers sold in more than one unit.

Figure 32. Section from paragraph 12 - EU's SUP Directive

(7) Food containers made of expanded polystyrene, i.e. receptacles such as boxes, with or without a cover, used to contain food which:

(a) is intended for immediate consumption, either on-the-spot or take-away,

(b) is typically consumed from the receptacle, and

(c) is ready to be consumed without any further preparation, such as cooking, boiling or heating,

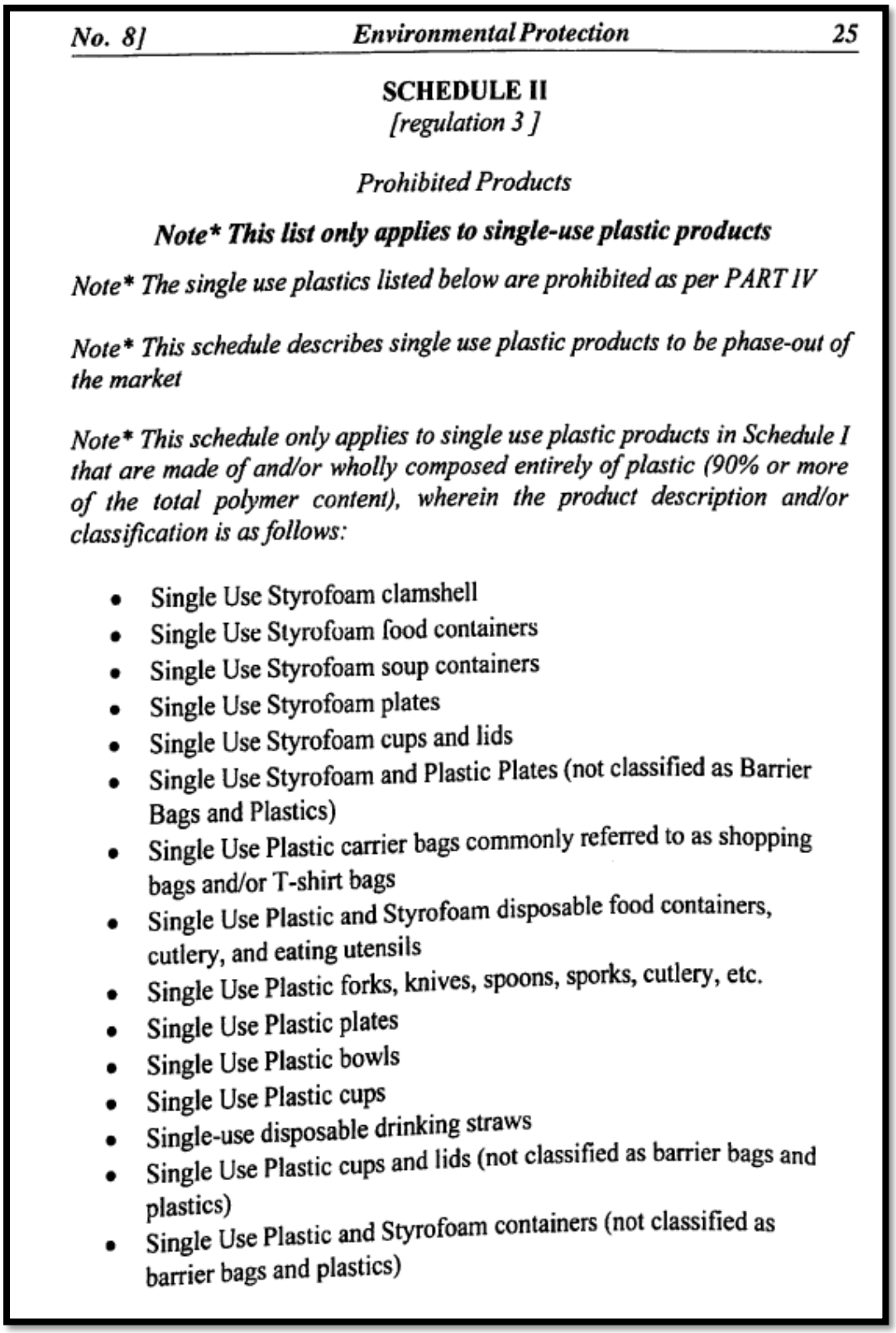
including food containers used for fast food or other meal ready for immediate consumption, except beverage containers, plates and packets and wrappers containing food;

(8) Beverage containers made of expanded polystyrene, including their caps and lids;

(9) Cups for beverages made of expanded polystyrene, including their covers and lids.

Figure 33. Section from Part B - EU's SUP Directive

APPENDIX O – Extract from Belize regulations



No. 8] *Environmental Protection* *25*

SCHEDULE II

[regulation 3]

Prohibited Products

Note* This list only applies to single-use plastic products

Note The single use plastics listed below are prohibited as per PART IV*

Note This schedule describes single use plastic products to be phase-out of the market*

Note This schedule only applies to single use plastic products in Schedule I that are made of and/or wholly composed entirely of plastic (90% or more of the total polymer content), wherein the product description and/or classification is as follows:*

- Single Use Styrofoam clamshell
- Single Use Styrofoam food containers
- Single Use Styrofoam soup containers
- Single Use Styrofoam plates
- Single Use Styrofoam cups and lids
- Single Use Styrofoam and Plastic Plates (not classified as Barrier Bags and Plastics)
- Single Use Plastic carrier bags commonly referred to as shopping bags and/or T-shirt bags
- Single Use Plastic and Styrofoam disposable food containers, cutlery, and eating utensils
- Single Use Plastic forks, knives, spoons, sporks, cutlery, etc.
- Single Use Plastic plates
- Single Use Plastic bowls
- Single Use Plastic cups
- Single-use disposable drinking straws
- Single Use Plastic cups and lids (not classified as barrier bags and plastics)
- Single Use Plastic and Styrofoam containers (not classified as barrier bags and plastics)

Figure 34. Extract from Belize Environmental Protection Regulations

APPENDIX P – Webinars Attended

(UK) Rethink Plastic Alliance[766]. *Writing the new story of plastic* – Thursday 29 October 2020

(Ire) University College Cork[767]. *How to Improve Recycling Together?* – Thursday 12 November 2020

(USA) Wilson Centre, China Environment Forum[768]. *Styrofoam Beach Snow: a Global Ocean Plastic Debris Challenge* – Thursday 19 November 2020

(UK) Styrenics Circular Solutions[769]. *True Circularity. Food contact. Powered by styrenics. Advances in the closed loop recycling of polystyrene* – Thursday 26 November 2020

(Ire) Modus / Eastern-Midlands Regional Waste Management Plan Office. *Pathways to the Circular Economy – Rethinking Packaging in the Circular Economy*[770] – Wednesday 10 February 2021

(Ire) Modus Circular Economy. *Sustainable Packaging.* Thursday 04 March 2021

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