ABSTRACT
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Abstract
Plastic pollution is one of the most prominent perceived threats to humans in 21st century. Harm is been posed to different environments in all parts of the planet, but the marine environments have been the traditionally most focused by the public. As the awareness of this problem has been growing during past decades, so are the proposed solutions legal and otherwise.

EU has posed the SUP Directive 2019/904/EU in solving the problem. The effectiveness of this directive is analyzed in this study and possible weaker points reflected for future legislative development. By comparing the situation of plastic legislation in different member states, possibilities of the directive’s implementation can be evaluated and effective practices transferable to other nations willing to solve the issue can be identified.

SUP Directive 2019/904/EU is found to be an efficient tool in reducing the effect of plastics to the environment and as an addition to the EU circular economy plans. Improvements of public health are not found, as the scientific evidence is lacking in the subject of microplastics. Further studies after implementation and statistic results are supported, as well as studies on the health aspects of plastics in human environment. International treaty on plastics might be negotiated in future.

Key words: Single-Use Plastics Directive, Single-Use Plastics (SUPs), Plastic Pollution, Recycling, Extended Producer Responsibility (EPR), Implementation.
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**Council of the European Union**


**European Economic and Social Committee**


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**Ministry of the Environment, Climate Change & Planning**

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**Nordic Council**


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### ABBREVIATIONS

<table>
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<th>Abbreviation</th>
<th>Description</th>
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<tr>
<td>Art(s).</td>
<td>Article(s)</td>
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<tr>
<td>CH₄</td>
<td>Methane</td>
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<td>CO₂</td>
<td>Carbon dioxide</td>
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<td>CoR</td>
<td>Committee of Regions</td>
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<td>EAP</td>
<td>Environmental Action Programme</td>
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<td>EESC</td>
<td>European Economic and Social Committee</td>
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<td>EPRO</td>
<td>European Association of Plastic Recycling &amp; Recovery Organizations</td>
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<td>EPR</td>
<td>Extended Producer Responsibility</td>
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<td>EPS</td>
<td>Expanded polystyrene</td>
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<td>EU</td>
<td>European Union</td>
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<td>Finnish Waste Act</td>
<td>Jäitelaki 646/2011 (Unofficial Author Translation)</td>
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<td>GDP</td>
<td>Gross Domestic Product</td>
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<td>GES</td>
<td>Good Environmental Status</td>
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<tr>
<td>HDPE</td>
<td>High-density polyethylene</td>
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<td>LDPE</td>
<td>Low-density polyethylene</td>
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establishing a framework for community action in the field of marine environmental policy OJ, 25.6.2008 L 164

**MARPOL 73/78**


**MECP**

(Malta’s) Ministry of the Environment, Climate Change & Planning

**MWMR**

Maltese Waste Management (Packaging and Packaging Waste) Regulations, Subsidiary Legislation 549.43

**OPA**

Oxo-degradable Plastics Association

**Packaging Waste Directive 94/62/EC**


**PET**

Polyethylene terephthalate

**PHA**

Polyhydroxyalkanoate

**PLA**

Polyactic acid

**PP**

Polypropylene

**PS**

Polystyrene

**PVC**

Polyvinyl chloride

**REACH Regulation 1907/2006/EC**

Spanish Act 11/1997

Spanish Royal Order 293/2018
Real Decreto 293/2018, de 18 de mayo, sobre reducción del consumo de bolsas de plástico y por el que se crea el Registro de Productores, Boletín Oficial de Estado nro. 122, 19.5.2018 (Royal Order 293/2018, 18th of May, on Reduction of Consumption of Plastic Bags and on Establishment of Producer Registry, Unofficial Author Translation)

SUP Directive 2019/904/EU

TFEU

UN
United Nations

UNEP
United Nations Environmental Programme

UNESCO
United Nations Educational, Scientific and Cultural Organization

USA
United States of America


Water Framework Directive 2000/60/EC

WCED
World Commission on Environment and Development
<table>
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<td>WHO</td>
<td>World Health Organization</td>
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FIGURES, TABLES & PICTURES

Figure 1. Legal Situation concerning Single-Use Plastics in 2018. Source: UNEP.

Table 1. Plastic demand in EU by sector in 2018. Source: PlasticsEurope.

Table 2. Post-use of Plastic in European Union by Percentages. Source: PlasticsEurope.

Table 3. Household Waste in EU Member States, Kilograms per capita in 2016. Source: Eurostat.


Picture 1. Dead Albatross in Midway Atoll. Credit: Chris Jordan.
1 INTRODUCTION

1.1 Introduction to Plastic Pollution

For a long time of human history, it was thought that nothing humans did couldn’t possibly affect an entity as large as the oceans.1 Today, marine plastic pollution is one of the defining environmental challenges of the early 21st century. Discussed in both international conferences and national politics, the topic has even influenced popular media, as it is in popular YouTube-video history of the entire world, i guess referencing to the issue by its name.2 Put to a same context with major historical events, such as the 11th of September terrorist attacks in 20013, the conquest of Constantinople in 14534 and the legalization of Christianity in Roman Empire in 3135, suggests its importance even to the common people.

As the marine ecosystems are essential for both marine and terrestrial environments to sustain life, their welfare is of utmost importance.6 Awareness of plastic pollution in the environment, especially in the oceans, has been growing since 1990s. Pictures of dead dolphins stuck in abandoned fishing nets, beaches filled with plastic trash and dead birds stomachs full of small plastic pieces have been spreading since late 1990s and burned to the mind of the youth from that era.7 The Great Pacific Garbage Patch was discovered in 1997; a large area between California and Hawai’i in the ocean partially covered by waste and mostly consisting of plastics, some of them which have been there for more than 50 years.8 While this gyre is the most famous of the plastic polluted ocean areas, multiple similar vortexes of waste exist.9 Plastic also causes harm in land, especially as there is an estimate of three times more plastics in land than in the oceans, even though previously mentioned often has more focus on discussions and the press.10

Plastic use has been on the rise during the last decades extremely quickly surpassing almost every other material and large quantities of the plastic ever produced have ended up to the

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1 Weis 2015, p. 3.
2 wurtz 2017.
3 Martin & Kushner 2011, p. 532.
5 Rosenwein 2014, p. 1. In the mentioned video, the year is mentioned of being 330, not 313, but it most likely refers to the founding of Constantinople, which happened at that time (Davis & Moore 2006, p. 12), and which is mentioned next in the video.
6 Weis 2015, p. 4.
7 Doble, Venkatesan & Kumar Nelamane Vijayakumar 2014, p. iii.
8 National Geographic, The Great Pacific Garbage Patch.
9 Doble, Venkatesan & Kumar Nelamane Vijayakumar 2014, p. iii.
10 UNEP, Plastic planet: How tiny plastic particles are polluting our soil.
According to the United Nations Environmental Programme (UNEP), 79% of the plastic ever produced has ended up in either landfills or the environment. This trend seems to be still continuing, as the plastic production has been increasing yearly and most of the yearly produced plastics end up to landfills or in nature. Consumers often treat plastic products as disposable, which lowers the rates of recovery. Economic damages of plastic litter in bodies of water in Asian and Pacific nations only is estimated of being $1,3 billion yearly. Of all materials littering the environment, plastic consists more than 80% being therefore the most important pollutant.

The communities around the world have started to respond to the issues posed by plastic pollution in the timeframe of raising awareness. Bangladesh was a first nation to introduce a partial ban on plastic products mostly concerning plastic carrier bags, which were responsible for 1988 floods in the country as the dumped bags created barriers and stopped water from flowing to the sea after heavy rains. Later on, the country followed with stricter measures targeting other plastic products as well. Between 2010 and 2019 the amount of different kinds of restrictions on plastic carrier bags has tripled in different parts of the world, showing that the measures are not only limited to some specific countries, but that the concern is global. In 2018 the World Environment Day, originally established by UNEP, was held with a theme of Beat Plastic Pollution and started a global information campaign to enlighten people of the plastic pollution and its dangers. The UN Environmental Assembly recognized the importance of eliminating plastics from the oceans in 2019. At the end of the year, Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (Basel Convention) amendment entered into force banning the transport of plastic waste to other countries without permits. As many nations look for solutions to cut their plastic usage, a comparative method might offer answers for

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11 UNEP 2018a, p. vi.
12 Ibid., p. 6.
13 Ibid., p. 5.
14 Ibid., p. vii.
17 Nielsen, Holmberg & Stripple 2019, p. 429.
18 UNEP, Beat Plastic Pollution.
19 Mathew 2019.
finding the most efficient ways of reducing plastic waste and to develop already existing systems.

European Union (EU) produces 25.8 million tons of plastic waste yearly, of which only around 30% is recycled. A large portion of this quantity is often taken to third countries, which often also have lower standards of environmental norms.21 Historically, China has been a major importer of such waste accounting of 56% of plastic waste imports,22 while at the same time being a major source of plastic pollution.23 As the transport of the waste will be more difficult in future, new solutions to the problem are required. As the EU member states are all part of the developed world, they have been able to establish networks of recycling for plastic, which are often expensive to manage,24 and often do not leak that much plastic waste to their environment. Deposit-systems for plastic bottles and developed recycling centers are a luxury, many countries in other parts of the world are unable to establish. They are also in critical place, when establishing new legislation, as other nations are following their results. Albania was the first nation in Europe to ban non-biodegradable plastic carrier bags in 201825 and other nations have been following the lead. EU has involved plastics in its Circular Economy Action Plan26 with strategy to cut the use of plastics and improve the recycling. In summer 2019, the European Parliament accepted the 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 (SUP Directive 2019/904/EU)27 based on the action plan banning certain single-use plastic products, restricting others and establishing a producer responsibility system. During early 2020 Circular Economy Action Plan was renewed as a New Circular Economy Action Plan28, which targets to achieve even higher ambitions relating to plastic products.

22 UNEP 2018a, p. 6.
23 UNEP, Beat Plastic Pollution.
25 Tirana Times 2018.
1.2 Defining the Issues

To be able to make reasonable comparison, some definitions have to established. Plastic is according to Cambridge Dictionary definition “an artificial substance that can be shaped when soft into many different forms and has many different uses”\textsuperscript{29}. In the SUP Directive 2019/904/EU Art. 3(1)1, plastic is defined to be “a material consisting of a polymer... to which additives or other substances may have been added, and which can function as a main structural component of final products, with the exception of natural polymers that have not been chemically modified”, in which the definition of a polymer described in Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC (REACH Regulation 1907/2006/EC)\textsuperscript{30} Art. 3(1)5 by its chemical description as “a substance consisting of molecules characterised by the sequence of one or more types of monomer units”. In practical terms plastics are a group of often petroleum-based polymers, that are commonly used for various purposes in different industries to offer products to the consumers from plastic bottles and toys to automobile parts and construction elements. They can be divided to two groups thermoplastics and thermosets based on their chemical properties, the first group being often easy to recycle and latter one being more difficult one.\textsuperscript{31}

Single-use plastics, sometimes referred as disposable plastics, are defined, in SUP Directive EU 2019/904 Art. 3(1)2, to be a plastic products “that is not conceived, designed or placed on the market to accomplish, within its life span, multiple trips or rotations by being returned to a producer for refill or re-used for the same purpose for which it was conceived”. Most common types of single-use plastics for common consumer are polyethylene terephthalate (PET), high-density polyethylene (HDPE), low-density polyethylene (LDPE), polypropylene (PP), polyvinyl chloride (PVC), polystyrene (PS) and expanded polystyrene.

\textsuperscript{29} Cambridge Dictionary, Plastic.
\textsuperscript{30} OJ 30.12.2006 L 396/1.
\textsuperscript{31} UNEP 2018a, p. 2-3.
These types of plastics consist of approximately two thirds of all plastic produced in 2015 and the numbers are not likely to have fallen in recent years. Of these materials, most are recyclable with the exception of PVC, PS and EPS, that cannot be remolded again. However, PS and EPS can be incinerated to produce energy. Typical types of single-use plastics include for example cigarette butts, various types of packaging and cutlery.

Biodegradable plastics are as the name suggests “a plastic capable of undergoing physical, biological decomposition, such that it ultimately decomposes into carbon dioxide (CO₂), biomass and water, and is, in accordance with European standards for packaging, recoverable through composting and anaerobic digestion” (SUP Directive 2019/904/EU Art. 3(1)16). These plastics can be petroleum-based or from renewable origins, if the previously mentioned conditions are fulfilled. It should be especially noted that there are no requirements for these plastics to decompose in nature, but only in composting and anaerobic digestion, which might not occur in nature. For those plastics, which can be turned back to natural materials in nature without specific conditions, exists the term compostable.

Bioplastics refer to the types of plastic that are made from renewable, often plant-based, materials from the natural environment. Common types of bioplastics are polyactic acid (PLA), made of corn starch, cassava or sugar cane, and polyhydroxyalkanoate (PHA) made by micro-organisms, that produce it from organic materials. PLA is typically used in packaging, bottles and cutlery, while PHA is common in medical applications, such as skin substitutes and dental filling, due to its safety. Even though the terms are sometimes used inseparably, it must be stated that all bioplastics are not biodegradable, and all biodegradable plastics are not bioplastics.

Plastic carrier bags, which will be referenced in multiple cases, are carrier bags, with or without handle, which are made of plastic and distributed to the customer at the point of sale, as defined in European Parliament and Council Directive 94/62/EC of 20 December 1994 on packaging and packaging waste (Packaging Waste Directive 94/62/EC) Art. 3(1)1b. Furthermore, plastic carrier bags are further categorized to light-weight plastic carrier bags,
defined having wall thickness less than 50 microns (Packaging Waste Directive 94/62/EC Art. 3(1)c), and very light-weight plastic carrier bags, having wall thickness of less than 15 microns (Packaging Waste Directive 94/62/EC Art. 3(1)d).

Extended producer responsibility (EPR) references to a situation, in which the producer, or in some cases the supplier, of the product is responsible, in addition to the production and supplying, of the end-use of the product. In Waste Framework Directive 2008/98/EC Art. 3(21) it is defined of producers having financial or financial and organizational responsibility on the management of waste stage of their products. EPR can have multiple forms from establishing a multi-level deposit-system to paying the government of their waste management costs.

1.3 Problem Statement & Research Question

Treaty on the Functioning of the European Union (TFEU)\(^\text{39}\) Art. 288 states that all directives accepted have to be implemented to the national law of each member state. The member states are able to choose the methods to achieve the given goals according to their wishes. The SUP Directive 2019/904/EU has to be therefore adapted to each nations own legal system, as the countries see fit. Formerly there has been directives, such as Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives (Waste Framework Directive 2008/98/EC)\(^\text{40}\) and REACH Regulation 1907/2006/EC, that have governed the use of plastics, but the SUP Directive 2019/904/EU does not have a clear previously established legal precursor, in which it would be established. TFEU Art. 3 differentiates the boundaries between EU and national competences, on which only the previously mentioned is allowed to create legislation. As there are no mentions on waste management, environmental management or health matters, the member states are able to a unique system of laws regarding their plastic management. However, TFEU Art. 4(2)e states that environmental competence is shared one. Shared competences require the member state to submit to EU legislation in those cases, where laws are specifically given, but otherwise they have powers to do as they please. This suggests


\(^{40}\) OJ 22.11.2008 L 312/3.
that the level of plastic production, use and management vary between different countries in the EU.

There has not yet been much studies concerning the SUP Directive 2019/904/EU, as it was just passed and has not been yet implemented in any member state up to this point. This process of implementation will be done by 3 June 2021 in most regards in all member states, according to the schedule set in the directive.\(^{41}\) As this is the first regulation on international or supra-national level targeting the marine and terrestrial plastic pollution, understanding its effects helps to understand the possibilities of legislative means solving this kind of issue. SUP Directive 2019/904/EU according to its own prelude focuses to leakage of plastic materials to the environment, specifically mentioning the marine environment. To achieve the goals, the directive focuses its efforts on producing the waste, which could end up in the oceans, most of which as stated previously is plastics and specifically single-use plastics.\(^{42}\) This is the cornerstone to which the directive has been built and in its context it has to be analyzed.

Success might mean similar legal tools been taken to use in other nations outside the Union, while failure sets an example to what not to do. Legal transplants taken from one country and moved to other nation are a common practice in law.\(^{43}\) However, to understand how these changes are done and to see where the success resulted is often analyzed by the means of a comparative legal analysis.\(^{44}\) Legal transplants from successful environment might offer an easy solution for the same problem in a nation, in which there is not yet legislation on the matter, but the success requires deep understanding the factors of said success.

From this basis of knowledge, the research questions following:

- By which means does the SUP Directive 2019/904/EU respond to the plastic pollution in the environment and do these means achieve the said targets?
  - If this is not the case, how can the directive be developed further to better fulfill these targets?

\(^{41}\) SUP Directive 2019/904/EU Art. 17(1).
\(^{42}\) Ibid. Preamble 1 & 3.
\(^{43}\) Nelken 2002, p. 32.
\(^{44}\) Smits 2002, p. 143.
- How have specific member states regulated single-use plastics before the SUP Directive 2019/904/EU and how can the directive best be implemented to different legislations of the specific nations?
  - Are these implemented measures transferable to legislations of third nations?

1.4 Methodological Framework

1.4.1 The First Question & Legal Analysis

According to sociological perception, the law is a reflection and compromise of society’s interests and needs to fulfill the role of common set of rules. Law has also been seen as an institutional power order or system of norms governing the decision-making. In the environmental law context, there are various interests of different actors to accommodate in the governance, such as the international community, the state and its institutions, the communities of the state and the private interests of individuals and corporations, as well as the interest of environment independently from previously mentioned. Amongst these interests lies the principle of sustainable development, consisting of social, economic and environmental aspects. As it could be understood from these multiple agents present in the process of defining the acceptable legal rules in a nation to govern its environment is a complex process and as this is taken to the EU level the process turns to even more difficult.

When laws are analyzed, there are certain footsteps to follow. First, there must be an understanding of what issue the law tries to solve and by what means this is tried to be achieved. In the first question, the answer can be found in the preamble of the SUP Directive 2019/904/EU, as it is clearly states its focus on environmental plastic pollution and especially marine plastic pollution. To achieve the understanding of what the meaning of words and the relationship between them, language of the law has to be understood. Fisher states that law often is more than the language itself, its content of being the revealing factor: the language has to be understood in its legal context and not just on the level of its literal meaning. This understanding is then applied and justified, which forms the basis for legal argument and also to analysis of the law. The understanding can be gained through logic.

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46 Fisher 2013, p. 6.
47 Ibid., p. 4.
48 Ibid., p. 10.
49 Ibid., p. 12.
and rationality, first being based on the traditional approaches of reasoning and latter being
based on either internal or external justification of said logic.50 This process is to be done
understanding the context of cultural and constitutional background.51

While legal study does not have any overpassing theory of a legal study, as the social
sciences do, many of the same principles in understanding of the text can be applied to legal
analysis as well. However, the major difference between the theories of social and legal
sciences are in their presented questions, as the social sciences often ask what the existing
rules are, while legal scholars try to interpret already existing rules, as in the case of law they
are already agreed upon.52 As Aarnio points out, while the empirical research and doctrinal
approach to law have the same origins, their path has been severed for long. At the same
time however, they still preserve the shared interest towards society as a structure and the
part of the laws in it.53 Empirical research methods have still been long used in the study of
law as a method to interpret the meaning of laws to interpret them as a part of their society
adding deeper understanding to blunt facts. Rather than just pointing out a solution based on
current laws, empirical legal study focuses on how things ought to be. By perceiving the law
in other that just in its traditional form, empirical research methods can also analyze the
effectiveness of laws, their possible side effects and various methods to improve. However,
there is a required stasis of non-objective position, in which the researcher makes the
research as the stated ideal situation is deeply personal experience based on values.54 To
answer the first sub-question, such research has to be considered.

As the perspective is relating to ethics, it is relevant to understand their relationship with
laws. Alder & Wilkinson describe the nature of conflicts in environmental matters defining
common interests in conflict, which can be development and conservation, moral and
economic values, within the realm of inter-generational equity, conflicts between
environmental values or non-human species.55 Plastic pollution often can be categorized to
many of these categories, since its nature is multidisciplinary. For example, as late-capitalist
society requires plastics to function, the value of conserving oceans is in conflict with the
economic development and free trade. Similarly, the largest polluters are developing nations,

50 Ibid., p. 13-19.
51 Desmet, Mascini & van Boom 2018, p. 5.
52 Aarnio 2011, p. 22.
53 Ibid., p. 24.
but their economies do not have a capacity to yet recycle the plastic, which their population uses and some of which is imported from the developed nations, establishing a problematic situation. In the developed world, the morals of nature have often been based on the Western philosophy, which values nature as an instrument of human welfare offering resources and disposing waste. This point of view has been opposed by those, who argue that nature should be valued as a living being and it as existing has value.

Environmentalism as an idea has been sometimes summarized to pursue minimizing harm to ecosystems and habitats, establishing sustainable pattern of resource use, minimizing harm for human health and maximizing of wild space and ecological diversity. These goals are already extremely general and at the same time do not account human civilization at all, for example lumber industry is by inherently in conflict with mentioned goals cutting down trees. From this conflict has been born the compromise of sustainable development, the development done in a way including the sustainability of environment, economy and society, that was first defined in World Commission on Environment and Development (WCED) report *Our Common Future* in 1987. As WCED defined the term in its often-quoted form, it has been afterwards used in various purposes and later has been seen highly controversial. While time has passed, the definition and ideology has been questioned even further, but as there are no better way to include nature and human worlds in same sphere, the term has stayed relevant. The ethics of natural use and especially sustainable use are by principle in conflict with plastic industry, since the same oil used to produce plastic now cannot be used by future generations to produce them plastic. However, by shifting the balance of recycled plastic closer to 100% the plastic industry would be by definition more sustainable than it previously has been. The question of future targets is therefore to be seen from the point of view of sustainable development.

1.4.2 The Second Question & Comparative Analysis

To answer the second question in a proper manner, there shall first be a comparative analysis on the existing laws of member states relating to the plastics, plastic waste and the single-use plastics. While it would be unreasonably difficult to compare all 27 member states in the scale of a single master’s thesis, the scale will be leveled to three nations in different states

56 Alder & Wilkinson 1999, p. 3 & 5.
57 WCED 1987, p. 43.
58 Alder & Wilkinson 1999, p. 16.
of plastic legislation or its effectiveness measured by actual status of recycling, prohibitions and use per person. After this the implementation of SUP Directive 2019/904/EU can be compared as it could be done.

Comparative law, as the name suggests, is comparing two or more legal practices. Nelken argues that this often also involves other disciplines as “ways of seeing” and to gain more substantive context for the topic in question, while not at the same time become an interdisciplinary topic.\(^59\) He also states that while it is not necessary to be an expert in the second discipline, one should be aware of the leading studies on the field and understand the societal theories behind the laws.\(^60\) Örüçü points out that by its advocates the comparative law in combination with legal philosophy is the only way to reach true understanding of the law.\(^61\) By its essence, the comparative law studies the differences and similarities between laws, while often having the descriptive question in its core if laws should be made more similar, having the two traditional groups of functionalists, or sociologists of law, and comparatists. The first group is argued of favoring homogenization of laws, while latter group prefers the diversity of laws.\(^62\) As Cotterrell states, the comparative law is at the same time seeking similarities and appreciating differences, and in open-mind comparative analysis both sides are present.\(^63\) Some scholars have later taken the position of questioning, why it is expected to find a difference in laws and how the societies themselves are reflecting the difference in laws.\(^64\) By some sociologists and economist, the law has been only seen as the reflection of society’s social or economic actions, while at the same time it cannot be out ruled, how the law reflects back to the society.\(^65\)

To consider the methodology and possibilities of comparative law, the context has to be introduced. Örüçü argues that the main rules of meaningful comparison of laws are comparability, methods and functional equivalence. Rule of comparability establishes that to compare two things they have to be similar or somehow like to each other to fulfill the same goal. Common solution to solving the question has been the problem these laws have been established to solve or the answer they propose. Rules of methods revolve around what

\(^{59}\) Nelken 2007, p. 17.  
\(^{60}\) Ibid., p. 17-18.  
\(^{61}\) Örüçü 2002, p. 3.  
\(^{62}\) Nelken 2007, p. 25.  
\(^{63}\) Cotterrell 2012, p. 39.  
\(^{65}\) Nelken 2002, p. 22.
methods can be used to compare legal text. In comparative studies it is expected to use textual comparisons familiar from other fields of studies in a normative, structural, institutional and positivist manner, without having pre-established hypothesizes rather focusing to the realistic present. There has however been a proposed creative comparative law research, in which the interest lies in core concepts and therefore ideal law systems could be presented. As a rule of functional equivalence, the law exists as a solution for society’s needs. Therefore, there is a need to establish the manner in which the compared legal tools fulfill the role in their legal, social, cultural, economic, religious and political background.66

Comparative law often also discusses of legal transplants or moving one’s legal tools from one sphere of law to another one. As it is relevant question to this study in the context of transferring the legal implementations of the SUP Directive 2019/904/EU to the third countries, it is important to understand how the comparative law scholars have previously seen this topic. As a term, the legal transplant is questionable, due to its implications of outside origin especially as a medical or botanical metaphor, it has still been used rather than alternatives such as legal irritants.67 Nelken describes how both schools of thought in comparative law have found a way to perceive them positively: functionalist writers seem to see them as shortcuts to answer possible future problem in society, while comparatists see most of the laws already in place as transplants from other times and cultures.68 As Europe has been the Faultline, within which both of the major legal systems of the world have been developed, there has naturally been legal borrowing from one system to other during the history. Due to this the legal works have been relatively similar even before the EU started its project to integrate the laws of its member states.69 While legal borrowing’s success is often dependent on social, economic and cultural factors, their similarity in larger context of Europe would suggest the possibility to move legal structures in multiple countries of the Union successfully, as the past has already shown.70 As all of the legal systems of the world can be categorized to the two European discourses, the question of adapting the directive to other countries is relevant and should be discussed, if success can be found there.

70 Ibid., p. 143, 146 & 147.
1.5 Chapter Summary

In this first chapter, the basics for the study have been introduced and the context of plastic pollution and awareness have been opened to establish a framework of understanding the relevance of this study. The main goals and research questions have been introduced and their scope has been limited to achieve a reasonably manageable consistency. A manner to answer to the research questions has been introduced, while the theoretical principles of chosen methods have been explained. The most important definitions have been laid out and explained. As a last part of the chapter, there is the summary of all chapters and what can be expected in each one.

In the second chapter, the history and development of plastics in a modern society are discussed as this is the relevant base of understanding the current global situation in plastic politics. After the invention of more developed plastics in 1970s, their use has been exploding having various effects to society and environment. The single-use plastics, as they are referred due to their purpose, consist two thirds of produced plastics and at the same time 79% of all plastics produced have ended up either in landfills or to the environment. Their polluting effect has focused to marine environment, but plastics are today found also on land and even in human bodies, with various effects. All is not however dark, since there has been a wide range of possible solutions presented from recycling and biodegradable plastics to manual collection of plastic waste from the environment.

In the third chapter, the legislation on plastics is perceived from different perspectives. First, the international legislation, which might relate to the topic, is discussed and the possibilities of a future treaty concerning the plastics. The EU politics on plastics and single-use plastics are discussed next in the frame of their history, following with already existing legislative tools. The laws guiding the Union environmental and waste policy have multiple connections to plastics and some aspects have already been regulated before the SUP Directive 2019/904/EU. As a last point of view, the different policies and laws of the member states are discussed and compared based on their viewed success.

In fourth chapter, the SUP Directive 2019/904/EU focused on further. The situation in selected states of Finland, Malta and Spain is view pre-2019 to establish a base for later comparison. Then it is discussed of the development of the directive, after which its contents are opened and described. Then the effectiveness of the directive contemplated from different perspectives and the first research question is answered as a conclusion. The
criticism of the directive is pointed out and other possible problems concerning the reducing of plastics are mentioned. Then the implementation of SUP Directive 2019/904/EU is shown and its possible measures are pointed out in the context of each country. The second questions are answered and the sub-question of transplanting the legal effects in other regions are considered. As a last topic, future of the plastic regulation both in the EU and globally are discussed.

In the fifth and last chapter everything is concluded and possible implications are pointed out.
2 PLASTICS AND POLLUTION

2.1 Plastic Pollution

2.1.2 Plastics & Single-Use Plastics

To have a frame for the issue of plastic is first necessary to understand the history of plastic and the roots of the problem. Plastic was developed in mid-19th century to be used as a replacement for multiple rarer substances, such as the ivory. The earliest plastics were made from natural elements, such as cellulose, until early 20th century saw the first petroleum-based plastics.71 Afterwards it has been a vital part of industrial development, especially after the Second World War, and its global use has grown from yearly 15 million tons of 1964 to yearly 381 million tons of 2015. Before 1970s relatively small amount of plastic was produced yearly and the numbers stayed fairly low, but after it there was an explosion in the use of this substance. 72 For example, after Nathaniel Wyeth patented polyethylene terephthalate (PET) bottle in 197373, it has ousted glass and metal as drink and food containers rapidly due to its cost and safety compared to the alternatives.74 In 2004 the three largest users of PET were Coca-Cola, Pepsi and Nestlé, which together held more than 80% of the market.75 By 1990s the plastic production surpassed the 150 million tons yearly, which was more than ten times the amount of few decades earlier.76

Before the rapid growth in the use of plastics in the 1970s, the plastic waste was not causing problems to from recycling or waste management point-of-view.77 This situation has however changed after the explosion in plastic use after 1970s. While PET was reinventing the drink and food industry, it also became the symbol of littering. Hawkins, Race and Potter describe the situation as such, that since there were no clear way to recycle the bottle, it showed how plastic only had immediate temporality, which ceased to exist after it was empty. The previous glass and metal containers were often collected due to their easy recycling processes, but the plastic bottle, in its almost invisible form, enhanced the idea of material dispensability to the masses.78 At the beginning of new century, the bottled water

72 Turpie, Lethey, Ng’oma & Moore 2019, p. 5-6.
73 Porta 2019, p. 2.
75 Ibid., p. 15.
76 Turpie, Lethey, Ng’oma & Moore 2019, p. 5.
77 Ibid.
has been raised to the status of smoking by some authors, who see the vanity of this culture especially concerning the waste and water issues of the world.\textsuperscript{79}

In 2015 it was estimated by UNEP, that the humanity had produced 6.3 billion tons of plastic in its history.\textsuperscript{80} This would also mean using 20\% of our petroleum reserves to the plastic production every year.\textsuperscript{81} This would mean that a large quantity of the available resources are used to support an industry, which is highly unsustainable by its very nature, while petroleum is getting more expensive and is required in other fields of a society. At the same time, the majority of plastic produced are single-use plastics, which according to their name are only having a single use during their lifespan before being ditched. A great majority of the plastic is produced in the areas of Southwestern Asia (26\%), North America (21\%), the Middle East (17\%) and Europe (16\%) rest of the world combining to the 20\%.\textsuperscript{82} According to the 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 (SUP Directive 2019/904/EU) preamble 5, 80-85\% of the all marine litter consists of plastic products. Furthermore, around 50\% of the total waste consists of different single-use plastic products and 27\% consists of fishing-related items, such as abandoned or lost fishing nets. The rest of the marine plastics consisting around 3-8\% of total mass are made of other plastic products, such as toys, electronical parts and other multi-use products. While 15-20\% of marine litter consists materials other than plastic, the numbers clearly point out, how the plastics are the dominating factor in the category of marine pollution.

Plastic is often not anymore leaked to the environment purposefully. While 1970s it still was a custom to dump waste to international waters, this has been banned by international treaties. However, voluntary actions, such as dumping to the oceans, or accidents, for example during transportation, continue to be major reason for our current issues.\textsuperscript{83} A famous example tells how in 1992, a shipping container containing 28,000 rubber ducks was lost in high seas nearby Hawaii and started their voyage. 25 years later these ducks are still washing to the beaches all over the planet from the Great Barrier Reef to the long coasts of Chile and from Normandy to New York City.\textsuperscript{84} In a recent study it was found that ten rivers

\textsuperscript{79} Hawkins, Race & Potter 2015, p. 142.
\textsuperscript{80} UNEP 2018a, p. 6.
\textsuperscript{81} Ibid., p. 2.
\textsuperscript{82} Ibid., p. 4.
\textsuperscript{83} Weis 2015, p. 8.
\textsuperscript{84} Knox 2017.
transport up to 95% of the plastic waste to the ocean.\textsuperscript{85} On the other hand, 80% of the marine pollution originates from land-based sources and are blown to the bodies of water by wind and rains.\textsuperscript{86} The movement of the oceans and seas is forming up aforementioned garbage patches in these larger bodies of water, which are mostly made up of plastics.\textsuperscript{87} Plastic is not an issue only to the top layers of the oceans; plastic particles also have been found at the bottom of Mariana Trench, the deepest trench in the oceans.\textsuperscript{88} According to UNESCO, the Henderson Island, one of the most remote and isolated places from any other landmass or population centers, has an acute problem of plastic pollution\textsuperscript{89} even though the closest inhabitants live 200 km away and the closest major population center is 5,000 km away.\textsuperscript{90}

According to Lambert and Wagner, plastics are not limited to the brine waters only as plastic particles have been observed in freshwaters in all continents\textsuperscript{91} and even in the drinking water after the purification process. The situation is developing to worse, since the World Health Organization (WHO) estimates that between 2015 and 2025 the amount will double.\textsuperscript{92}

\subsection*{2.2.2 Microplastics & Photodegrading}

Microplastics have recently been rising as a popular topic to refer, when discussed of plastic pollution. They are small pieces of plastics widely defined by them being smaller than 5mm by their size.\textsuperscript{93} Microplastics form a large quantity of all plastic in the Great Pacific garbage patch\textsuperscript{94} and most people have heard about the effects the pollution has on marine life. The microplastics were first found in the environment around 50 years ago and their amount has been growing from since. The origins of microplastics can be divided to the categories of primary and secondary microplastics.\textsuperscript{95} Primary microplastics are produced mostly as a part of larger products, such as car tyres, or added to cosmetic products, in which they are called microbeads.\textsuperscript{96} Most common they are in skin clear products and toothpastes, in which they

\begin{flushleft}
\textsuperscript{85} Schmidt, Krauth & Wagner 2017, p. 12250.  \\
\textsuperscript{86} Weis 2015, p. 42.  \\
\textsuperscript{87} National Geographic, The Great Pacific Garbage Patch.  \\
\textsuperscript{88} Gibbens 2019.  \\
\textsuperscript{89} Parker 2019b.  \\
\textsuperscript{90} UNESCO, Henderson Island.  \\
\textsuperscript{91} Lambert & Wagner 2018, p. 6.  \\
\textsuperscript{92} Watts 2019.  \\
\textsuperscript{93} Lambert & Wagner 2018, p. 5.  \\
\textsuperscript{94} National Geographic, The Great Pacific Garbage Patch.  \\
\textsuperscript{95} Lambert & Wagner 2018, p. 5.  \\
\textsuperscript{96} Ibid., p. 5.
\end{flushleft}
are added to have higher friction, which makes the products more effective. They can also be used to achieve longer shelf-life for the product or to have various other effects.97

Secondary microplastics are formed of the two groups of regular and oxo-degradable plastics. All plastic based materials fragment to smaller pieces in time due to the solar radiation in a process called photodegrading, which is especially strong effect in sunny areas, such as beaches and deserts.98 Lambert and Wagner state, that while the most of plastics end up to landfills or straight in the environment, winds and rain often move the materials to other locations. Being exposed to the elements, plastics fragment to smaller pieces and can spread to a larger area with faster speed travelling long distances.99

Oxo-degradable plastics are materials defined in SUP Directive 2019/904/EU Art. 3(3) as “plastic materials that include additives which, through oxidation, lead to the fragmentation of the plastic material into micro-fragments or to chemical decomposition”. In practical terms, these materials are designed and argued of being degradable in oxygen-based environment, such as in a body of water or in the environment, but nothing of the sorts have not been able to be proven and arguably these materials only rapidly fragment to microplastics.100 While this effect takes place regarding to all plastics in time due to solar radiation, but these materials are exceptionally vulnerable to fragment to small pieces due to their chemical and structural design.101

2.2 Plastic on Environment
Plastic has spread to most ecosystems in the planet with tremendous speed. The oceans are not only places, where the plastic causes problems, as in most environment is the planet have at least some degree of plastic pollution. The estimations of plastic waste in nature vary, but large quantity of it ends up in the oceans. Most of people in the Western world have already read or heard about the Great Pacific garbage patch, which weight is measured in millions of tons and of which size is difficult to estimate since, according to recent studies, about 70% of the debris actually sinks to the bottom of the ocean.102 This number has also been

97 Australian Government, Plastic microbeads.
98 UNEP 2018a, p. 2.
101 Lambert & Wagner 2018, p. 5.
102 National Geographic, The Great Pacific Garbage Patch.
contested for even more waste ending up to the ocean floor; according to Eunomia consulting company report, only 1% of the marine plastic is floating on the surface, while 94% ends up in the bottom of the oceans.\textsuperscript{103} This is also not the only garbage patch and even smaller seas are developing their own garbage patches due to the human activity.\textsuperscript{104} Major issue with the plastic is its long lifespan, that might vary between 500-5000 years.\textsuperscript{105} As none of the plastics ever produced has yet to achieve this age, there is still some arguing in the scientific community of the exact number.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{dead_albatross.jpg}
\caption{Dead Albatross in Midway Atoll.}
\end{figure}

Most people concerned of plastic pollution have seen the famous picture of Chris Jordan taken in Midway islands of the dead albatross stomach filled with plastic particles, that has become the symbol of the harm caused to the fauna by plastics and man-made pollution. There seems to be a clear cause for the death of this bird seen in the picture, which is only the tip of the iceberg. Similarly to albatrosses, many of the other birds are vulnerable to plastic pollution, when eating fish that have consumed smaller particles.\textsuperscript{106} Ghost nets, often broken nets that have been left to ocean to drift with the currents, catch and kill fishes that

\textsuperscript{103} Eunomia 2016, p. 3.
\textsuperscript{104} National Geographic, The Great Pacific Garbage Patch.
\textsuperscript{105} Bio Tech Environmental, Lifespan of Plastic.
\textsuperscript{106} Lambert & Wagner 2018, p. 11.
are never eaten lowering the fish stocks already greatly affected by overfishing. They often also catch other marine life, such as sea turtles, dolphins and birds, that are competing with the humans for these fishes or are just coincidentally passing by. Whales and dolphins are also threatened by other plastic waste as it gathers to their bodies and fills their systems; this has been assumed by professionals of being a reason for cases in which an animal ends up in a beach. Microplastics have been found on the smallest planktons, baby fish and ocean bacteria, which are expected to be mistaken as food. However, the small organisms cannot digest them possibly causing deaths in the early stage of the food chain. From bacterial and plankton-level the plastic affects to the marine ecosystem with various ways gathering to the top of the food chain and therefore to the largest of animals.

On land, plastic is also mistaken as food by birds, mammals and other species that suffer the same fate as their marine counterparts. Modern tests have proven liver, reproductive and cellular damages on animals exposed to plastic pollution. While land species are not similarly vulnerable to the accumulation of plastic particles from micro-organisms, the colorful pieces can often be mistaken for food and cause health risks by removing the feeling of hunger or piercing organs. The effects on land and soil are argued of being even more severe than the ones in the ocean and have high likelihood of ending up to the food chain. By covering the land, they also block the growth of plants entirely on some regions.

Based on these facts, it is not overstated to argue that plastics are also ending up to the human body as humans consume foods from the natural world. We as a species have already been exposed to small pieces of plastic in our drinking water for certainty and most likely to other particles through other channels as well. There are no studies that would show the negative impacts of plastics to humans and relevant animal studies are inconclusive on their role in human health, in which conclusions could be made. However according to the WHO, the effects of the plastics to other mammals and species suggest that there might be issues we are not aware yet. On the other hand WHO also points out that, humans have been

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107 Weis 2015, p. 4.
108 Doble & Muthukumar 2014, p. 4.
110 Parker 2019b.
111 Lambert & Wagner 2018, p. 11.
112 Parker 2019b.
113 Ibid.
114 UNEP, Plastic planet: How tiny plastic particles are polluting our soil.
115 WHO 2019, p. 8.
116 Ibid., p. 64.
exposed to the smallest of particles without any problems, so emerging problems are not likely for a healthy body.\textsuperscript{117} Studies reflected by WHO haven’t yet found connections between health risks and consuming microplastics by themselves, but chemicals in plastics are often found to be toxic.\textsuperscript{118} Plastics often have other chemicals added to them, which are in some cases dangerous, for example PS and EPS have particles in them that are carcinogenic, and impact to human respiratory, reproductive and nervous system.\textsuperscript{119} Based on this, it would be wise to study the effects with care, since it seems to be likely that humans will live amongst plastic in future as well.

2.3 Proposed Solutions to Plastic Pollution

2.3.1 Recycling & Circular Economy

The issue formed by plastics has already formed an action around it to respond to this problem. The responses have varied from private citizen starting to recycle to private company changing their business conduct to be more material efficient and environmentally responsible. In the side of public agents there have been educational campaigns, legal actions and public infrastructure been reformed to more efficiently use available materials and avoid the loss of plastics as a waste. The plastic industry itself has also awaken to the issue and in recent years developed new materials based on biodegradability and sustainable resources.

Of the plastics ever produced only 9% has ever been recycled with 79% ending up in landfills or in nature. By 2050 it is estimated that there will be 12 billion tons of plastic in the landfills around the world with trend going upwards largest producers being China and Indonesia.\textsuperscript{120} This is however entirely the reason of these two countries, since major part of their plastic waste is imported from developed countries that are not willing to recycle their own wastes. For example, 56% of the Chinese plastic waste was imported from other nations in 2017.\textsuperscript{121} Especially Southeast Asian nations have been taking in the wastes from other countries after China banned this practice in their soil in 2018, which often end up in illegal landfills and from there to nature. However, the trend has continued to spread and in 2019 the Philippines also banned the imports of plastic waste even sending back some Canadian transports, that

\textsuperscript{117} WHO 2019, p. 64-65.
\textsuperscript{118} Ibid., p. 64-65.
\textsuperscript{119} UNEP 2018a, p. 15.
\textsuperscript{120} Ibid., p. 6-7.
\textsuperscript{121} Ibid., p. 6.
had imported their waste often illegally to the country for years, threatening with war if the practice does not end. Canada responded to this by accepting to take their plastic waste back and by recycling it in Canada. This would suggest that in future the western countries have to recycle their own waste, but examples are pointing to other direction. According to the team of The Guardian reporters, the plastic waste will be transported to less developed nations with lower legislative frameworks concerning plastic, with the highest growth recorded in Senegal, a country that previously handled virtually no plastic from the United States (USA). It would not be farfetched assumption that in future more often than not the plastic waste is sent to poorer countries of Africa.

Recycling has been seen by many as the most efficient way to combat plastic pollution in its modern form. The cheap price and a wide range of applications has made the plastic polymers fast-grown industry, without concerns for the end-of-life cycles. As the availability of the natural resources has changed in a new century, new solutions are required to fulfill the needs of consumer base. Miranda et al. argue that by recycling the plastics in daily use, its spread to the environment can be prevented and at the same time it is possible to gain raw materials for future. The development of efficient waste recycling processes would also save energy. As mentioned, most of the plastic used is not recycled at the moment and based on the evidence given, there might be a need for rising of this percentage in future. In some communities this challenge has been accepted, for example in Finland the percentage of recycled PET bottles has stayed over 90% for years and overall plastic recycling percent has been rising quickly to 27% by 2017. This shows that if there is a political will and possibility of investments, the Western nations could potentially handle their own plastic waste in future and not send it to be other country’s problem.

This would also a potential business-model for future entrepreneurs to move waste for recycling to a country that has possibility to handle larger streams of waste they themselves are producing and afterwards sell the raw materials gained back to the market. This would not remove the problem of already existing plastic in landfills, but there has been suggestions

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122 Endo 2019.
123 Ellis-Petersen 2019.
125 Miranda et al. 2013, p. 98.
126 Ibid., p. 99.
127 Palpa, Deposit-based system.
128 Rinki, Rinki kokoaa pakkaustiedot yli 4000 yritykseltä.
for mining the previously used landfills to find more raw materials, that have been dumped there before the idea of recycling existed. As landfills are also a major producer of methane (CH₄), which is agreed of being worse climate gas than carbon dioxide (CO₂), this could also be a major development in a combat against climate change and a possibility to avoid future issues of plastic pollution spreading with rains.¹²⁹

2.3.2 Bioplastics

One suggested solution has been to make traditionally polymer-based products, such as sunglasses and toothbrushes, of other, more sustainable materials. For example, in the case of toothbrushes, around 3.6 billion of them are used yearly with most of them made from plastic. Companies inspired by public awareness have recently been introducing wooden items to the markets to respond to growing demand of more ecological dental care.¹³⁰

Avoiding the single-use plastic carrier bags and cutlery has become more popular and it seems that traditional plastic carrier bags are losing ground.¹³¹ However, the global trends should not be concluded based on the perception of the Western consumer and in global market the share of plastics is still on the rise.

Bioplastics created from renewable or organic materials have been rising in popularity as a solution to the issues mentioned. While bioplastics have many advantages compared to traditional plastics, they are still not free of issues. Most areas do not have systems in which to handle large quantities of such materials and they end up in landfills, where they are prone to release CH₄, as previously mentioned. The ending up in landfills can also happen due to mixing the bioplastics with traditional plastics in recycling phase after which either plastic managing system cannot handle the mixture and all of them would end up in landfill.¹³² The process of their creation is not either without issues: often created from natural oils they are competing of the land area with food production in a world where the climate change will make farming even more difficult. At the moment, the bioplastics are also more expensive compared to petroleum-based ones. There are however projects to create plastics from biowaste even though this would then compete of materials with biofuel production.¹³³

¹²⁹ Jones 2017.
¹³⁰ Denham 2018.
¹³¹ Danigelis 2018.
¹³³ Ibid.
2.3.3 Other Solutions & Developments

The limits of solutions do not end to the ideas of mere recycling and using other materials, especially since the existence of the pollutants in natural environment is currently an issue of the present. Solutions engineered commonly focus to either more efficient recycling process, new innovative materials or collecting the existing pollutants from the environment. Especially the last of these has gained support, since even if the humankind would not produce any plastics going further, the existing ones would still stay in the environment possibly for thousands of years. Projects such as “Ocean Cleanup Array” by inventor Boyan Slat to clean the oceans of the plastics\textsuperscript{134} or “The Ocean Saviour” by Richard W. Roberts and Simon White\textsuperscript{135} have raised the interest of the public and have been presented in the media\textsuperscript{136}, but for now have not achieved that remarkable results. Multiple companies have seen a possibility to use the plastics collection as a selling point of their products by either producing from collected materials or using their profits to support the campaigns to clean up the environment. Though this allows to the customer to support the practices they personally see morally right, it is still too small-scaled to change the big picture. Collecting projects seem to fail in multiple fronts for now and therefore Eriksen et al. argue that it would be reasonable to first focus on upstream phase, the creation of plastic pollution, rather than the effect.\textsuperscript{137}

To understand the depth of human effect to the planet, there are already naturally developed species that are using plastics as a source for food. PET can be consumed as an energy source by Ideonella Sakaiensis 201-F6, naturally occurring mutated bacteria, which has led to more efficient versions of this bacteria to be developed for recycling purposes. Similarly, certain other bacteria have developed in nature to degrade LDPEs and HDPEs.\textsuperscript{138} This seems to suggest that in some ecosystems these plastics are common enough that a species would accept them as a source of nutrition, rather than continuing to consume the things they used to do, which is a sign of deeply rooted contamination in the natural environment. However, these developments also lead to the purification of said environment, if it is possible to cut

\textsuperscript{134} The Ocean Cleanup, Frontpage.
\textsuperscript{135} Ocean Saviour, Frontpage.
\textsuperscript{136} Venema 2014, Singh 2013, Perrigo 2018 and multiple other similar articles.
\textsuperscript{137} Eriksen et al. 2018, p. 278.
\textsuperscript{138} Porta 2019, p. 4.
the source of the plastic pollution or to use these species to artificially clean up different natural or urban environments.

As the previous chapters point out, while the trend on the plastics is shifting from unlimited use to more careful use of resources and towards more environmentally friendly polymers in some regions. However, this development has so far been slow, and plastic-use is still on the rise, which simultaneously means that so is the plastic pollution. The awareness of the problem has been raising amongst the populations and private sector, which has led to these incentives to perhaps prevent and clean the environment. All action has not been made by the private agents and the global community of the states and international organizations has also started to push towards a change in attitudes, policies and legal frameworks.

As the plastic is contaminating the environment, a long-term shift is at some point to entirely move away of using plastics might be needed, if not for other reason, then due to their usage of petroleum that is more often needed elsewhere. The plastic production takes around 20% of all petroleum at the moment\textsuperscript{139} and as the demand of plastic is rising, the consumption of natural resources is expected to rise as well. At the same time, the production of petroleum is inevitably peaking at some point.\textsuperscript{140} The recycling would allow the use of lesser amounts of oil, but on the other hand many of the plastics used cannot be recycled.\textsuperscript{141} Similarly, there is also always a loss in circular economy, which means that already existing plastics cannot be used forever. Therefore, the traditional plastics will be removed from society at some point and replaced by ones from renewable sources, only question remaining is when this will happen.

### 2.4 Plastics in European Union

European Union member states were producing 17% of the global plastics in 2018, which transfers to 61,8 million tons compared to the global production of 359 million tons.\textsuperscript{142} In 2008 the member states were producing 60 million tons, which was at the time 25% of the global production on 245 million tons.\textsuperscript{143} This trend suggests the rapid growth of the global industry, while the European markets have been somewhat stable at the time. While the role

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\textsuperscript{139} UNEP 2018a, p. 2.  
\textsuperscript{140} Greer 2013, p. 122-123.  
\textsuperscript{141} UNEP 2018a, p. 3 & 5.  
\textsuperscript{142} PlasticsEurope 2019, p. 14-16.  
\textsuperscript{143} PlasticsEurope 2009, p. 6.
of EU has been decreasing on the production, its needs for plastics have not been changing. While most of the plastics polluting the marine environments bordering the EU are not originating from the Union, a large quantity of them come from the member states. European sphere is a major part of a global world and changes in Europe are reflecting outwards to other regions. In addition, the proximity to the Artic region adds specific element to the European discussion on plastics.\textsuperscript{144} The Mediterranean is one of the most plastic polluted regions in the planet, of which most has been spreading from the European side.\textsuperscript{145} The plastics are also a strategic question for European economy. As the petroleum to produce plastics is not available in EU, but has to be imported from elsewhere, the competition has made changes in the markets. Today EU is a world leader on bioplastic consumption with more than half of the produced substances, followed far behind by Asia/Oceania region with its quarter of a share.\textsuperscript{146} Similarly, the recycling efforts have been seen as a possible answer to keep the plastic available, but also as a possibility to reduce their effects on the environment.

Table 1. Plastic demand in EU by sector in 2018.

<table>
<thead>
<tr>
<th>Sector</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Packaging</td>
<td>39.9</td>
</tr>
<tr>
<td>Building &amp; Construction</td>
<td>16.7</td>
</tr>
<tr>
<td>Automotive Industry</td>
<td>9.9</td>
</tr>
<tr>
<td>Eletronics</td>
<td>6.2</td>
</tr>
<tr>
<td>Household, Leisure &amp; Sports</td>
<td>4.1</td>
</tr>
<tr>
<td>Agriculture</td>
<td>3.4</td>
</tr>
<tr>
<td>Others</td>
<td>19.8</td>
</tr>
</tbody>
</table>

The three most common plastics are PP (19.3%), LDPE (17.5%) and HDPE (12.2%) all of which are recyclable. All of these are mainly for single-use purposes, with some minor uses

\textsuperscript{144} SWD(2018) 254, final, p. 7.
\textsuperscript{145} Schweitzer & Sigalou 2018.
\textsuperscript{146} Porta 2019, p. 5.
in automotive industry, construction industry and agriculture.\textsuperscript{147} Most of the plastic use is composed of single-use plastics, with packaging being the largest single field by almost 40\% of total usage.\textsuperscript{148} Single-use plastics are also used in various other practices, such as tobacco product filters which are the second most common found polluting object in marine environments,\textsuperscript{149} and plastic cutlery. In 2018 strategy for plastics in circular economy, it is pointed out that 59\% of plastics used to packaging, of which only 6\% is recycled. In EU, up to 500 000 tons of plastic waste ends up to marine environment yearly.\textsuperscript{150}

Table 2. Post-use of Plastic in European Union by Percentages.

<table>
<thead>
<tr>
<th>Year</th>
<th>Recycling</th>
<th>Energy Recovery</th>
<th>Landfill</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>30</td>
<td>20</td>
<td>50</td>
</tr>
<tr>
<td>2008</td>
<td>25</td>
<td>30</td>
<td>45</td>
</tr>
<tr>
<td>2010</td>
<td>20</td>
<td>35</td>
<td>45</td>
</tr>
<tr>
<td>2012</td>
<td>15</td>
<td>40</td>
<td>45</td>
</tr>
<tr>
<td>2014</td>
<td>10</td>
<td>45</td>
<td>45</td>
</tr>
<tr>
<td>2016</td>
<td>5</td>
<td>50</td>
<td>45</td>
</tr>
<tr>
<td>2018</td>
<td>0</td>
<td>55</td>
<td>45</td>
</tr>
</tbody>
</table>

If littering and unauthorized dumping is not taken into account, 32,5\% of the produced plastics is recycled, 42,6\% is turned into energy mostly by burning and rest 24,9\% ends up in the landfills.\textsuperscript{151} The trend is moving to more sustainable direction and after 2006 the percentage of recycling has doubled, and energy recovery has almost also doubled (77\%) but ending up in the landfill is still a fate for almost quarter of all plastics produced.\textsuperscript{152} Recovering plastics to be either re-used, recycled, incinerated or dumped to a landfill is an expensive effort even from collection point of view, which explains why various countries

\textsuperscript{147} PlasticsEurope 2019, p. 22-23.  
\textsuperscript{148} Ibid., p. 20.  
\textsuperscript{149} SUP Directive 2019/904/EC, preamble 16.  
\textsuperscript{150} COM(2018) 028, final, p. 1-3  
\textsuperscript{151} PlasticsEurope 2019, p. 27.  
\textsuperscript{152} Ibid., p. 28.
rather cut their usage of plastics than establish such networks of collection.\textsuperscript{153} A lot of the plastic has also been transported from the European Union member states to the third countries, mostly to Asia, with fivefold growth in this between 1999 and 2011.\textsuperscript{154} As the plastic transportation is becoming more unacceptable in international view and multiple countries are banning the activity, the developed nations are to invest for more efficient recycling systems to manage their waste. Between 2016 and 2018 the transportation of plastic waste outside EU decreased by 39\%.\textsuperscript{155} The current direction points to continuing decrease of plastic ending up to landfills and increase in recycling, trends which might accelerate as the nations are required to handle their wastes within their borders.

Table 3. Household Waste in EU Member States in 2016, Kilograms per capita.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{chart.png}
\caption{Household Waste in EU Member States in 2016, Kilograms per capita.}
\end{figure}

In 2016, 42\% of the plastic packaging waste was recycled in the EU, as the highest percentage was of Lithuania’s 74,4\% and the lowest was of Malta’s 23,5\%.\textsuperscript{156} As the plastic packaging waste is the highest contributor to single-use plastics with its percentage of 39,9\% of all plastics, the order of the countries can be expected to be similar in concern to all single-use plastics. On the other hand, if all forms of recovery are taken into account, involving incineration in addition to recycling, the situation changes as Austria rises to be the highest

\ \textsuperscript{153} Doble & Muthukumar 2014, p. 14.
\textsuperscript{154} COM(2013) 123, final, p. 8.
\textsuperscript{155} PlasticsEurope 2019, p. 29.
\textsuperscript{156} Eurostat, Recycling rate of packaging waste by type of packaging.
contributor with informed 100% recovery rate. Similarly, country such as Finland with recycling rate of only 25,4% has the total recovery of 97,2%. Different results in percentages, which can further be seen in Table 3 (page 33), therefore suggest different policies and laws regarding the single-use plastics in different nations, even though the EU has set an existing framework for national policies. Nation states have also tackled some of the issues, the EU has not yet regulated or made policy of. One of these is the ban or restriction set on plastic microbeads in products, which so far has been put to place in Italy and multiple other nations have made promises to create similar laws as well.\textsuperscript{157} Overall, national strategies differ also due to other variables and their national situations, which in some cases might relate to their possibilities and actions.

\textsuperscript{157} Arroyo Schnell, Klein, Gómez Girón & Sousa 2017, p. 8.
Table 4. 2016 Recycling and Recovery of Plastic Packaging Waste in EU-27 as Percentages.
3 LEGAL RESPONSES TO PLASTIC POLLUTION

3.1 International Legislative Framework

For now the international legislative response has been limited to splintered treaties focusing some aspects of plastic pollution, while there has not yet been an international treaty to specifically target this issue. The International Convention for the Prevention of Pollution from Ships, 1973 as modified by the Protocol of 1978 (MARPOL 73/78) \(^{158}\) Annex V Regulation 3.1(a) prohibits the dumping of plastic or incinerated plastics to the oceans, which is the only existing piece of legislation in the international field concerning straightly the dumping of plastics. It has been proposed that this regulation could also been widened to include non-intentional dumping and retaining plastic in a manner, which allows it to end up in the oceans. \(^{159}\) Other piece of legislation concerned with the issue of plastic is the Basel Convention, which was amended in 2019 to include the movement of plastic waste between countries, especially considering the movement of plastic waste from the developed countries to the developing countries and the least developed countries. In the regional level multiple conventions have been established to protect single bodies water, such as Convention on the Protection of the Marine Environment of the Baltic Sea Area \(^{160}\) and Convention for the Protection of the Marine Environment of the North-East Atlantic \(^{161}\), which all are established to protect their respective maritime area and have provisions concerning plastic pollution. It has been argued that as MARPOL 73/78 Annex V stopped the tar balls created by the oil tankers, an international treaty to prevent plastic ending up to the environment would be the most effective way to address the issue in future. \(^{162}\)

From political point of view there has been multiple active measures taken to tackle the issue especially in concern to the maritime pollution. UN Sustainable Development Goals for 2015-2030 have marine life protection as a target number 14, including protection from plastic pollution. \(^{163}\) In Rio +20 Convention of 2012 a Global Partnership on Marine Litter was established to association with UNEP to address the effects of marine litter worldwide.


\(^{159}\) Eriksen et al. 2018, p. 278.


\(^{162}\) Eriksen et al. 2018, p. 278.

\(^{163}\) United Nations, Sustainable Development Goals.
and to enhance international co-operation on the issue.\textsuperscript{164} In 2019, the United Nations Environmental Assembly recognized the importance of eliminating microplastics from the oceans, which is to be seen as a first stage in solving the issue.\textsuperscript{165} Similarly, G7 and G20 have adopted their own political plans to reduce marine litter mostly consisting plastics and possible removal of existing plastics.\textsuperscript{166} Regionally, for example the Nordic Council has established their own program to protect arctic seas.\textsuperscript{167} Active political sphere might be suggesting a future treaty.

In national level, nations have been having differing ways to approach the issues presented by plastics. Nielsen, Holmberg and Stripple point out, that plastic carrier bags are often seen as a spear tip of an attack against plastic products, as they are often found in the environment and cause harm.\textsuperscript{168} In 1988 plastic carrier bag littering even was responsible for a massive flooding in Bangladesh causing several deaths.\textsuperscript{169} Germany was the first country to state-level ban the selling of the light-weight plastic carrier bags and later multiple governments have banned or are taxing the selling of them.\textsuperscript{170} Between 2010 and 2019 the amount of different kinds of restrictions on plastic carrier bags tripled in different parts of the world.\textsuperscript{171} At the moment, these efforts have mostly been focused on Europe, but other regions have been acting in similar ways lately, even though some in just municipal or provincial levels. South Africa, India and Bangladesh introduced partial bans in 2002 and have later followed up with stricter measures.\textsuperscript{172} Especially in South Africa the situation has been difficult and there are so many plastic bags littering the environment, that people jokingly refer them as “the new national flower”.\textsuperscript{173} Xanthos and Walker state that even though there have been a few studies of the effectiveness of these regulations, the existing ones suggest that these acts are efficient at reducing the amount of plastic carrier bags used yearly per capita. Even though an active ban would not be acted upon, the education and awareness campaigns have been proven to be an effective measure as well.\textsuperscript{174}

\begin{thebibliography}{9}
\bibitem{164} UNEP, Global Partnership on Marine Litter: Status and Future Plans.
\bibitem{165} WHO 2019, p. 62.
\bibitem{167} Nordic Council 2017, p. 8.
\bibitem{168} Nielsen, Holmberg & Stripple 2019, p. 428.
\bibitem{169} UNEP 2018a, p. 13.
\bibitem{170} Xanthos & Walker 2017, p. 20.
\bibitem{171} Nielsen, Holmberg & Stripple 2019, p. 429.
\bibitem{172} Xanthos & Walker 2017, p. 19-20.
\bibitem{173} UNEP 2018a, p. 13.
\bibitem{174} Xanthos & Walker 2017, p. 21-22.
\end{thebibliography}
Other system concerning the single-use plastics in national level has been the establishment of returnable bottle deposit systems, in which the customer is paying a fee, when buying a PET bottle that is returned if the bottle is returned to recycling. With this kind of system in place, for example the Nordic countries have achieved the recycling rate between 85-100% of all PET bottles.\textsuperscript{175} High numbers have also been achieved in places, where all plastic is not that thoroughly recycled. In Canada, the recycling percentage is depending the plastic product and while in PET bottles it is 56-58%, overall it is estimated of being 22-37%.\textsuperscript{176} Recycling is often more expensive than outright incineration, but at the same time it offers new materials for the economy previously unused. However, the lack of transparency, traceability and demand for the recycled plastic products is often seen as a problem along with the price of establishing such a system.\textsuperscript{177} Hawkins, Race and Potter however point out, that the keys to this specific problem still lay in the hands of the consumer and, while there is the three-arrow-sign of recyclability in the bottom of every bottle, it does not assure that the bottle ends up even in the trash can.\textsuperscript{178}

For now, it seems that the independent nations have awakened to the problem and so have the consumers in most areas. Unlike in issues, such as the climate change, the problem is clearly visible to the everyday citizen and therefore there has never been scientific argument about the ramifications or the existence of plastic pollution, unlike in the case of climate change. As stated, there are also options and possibilities to change the current systems into more ecologic ones with options, such as recycling and biomaterials. It has also notified that, the nation states have shown their willingness to act and therefore, it could be argued that in nearby future a possible treaty on plastic can be negotiated successfully, similar to the Montreal Protocol on Substances that Deplete the Ozone Layer\textsuperscript{179} that has been considered a model for successful environmental treaty.\textsuperscript{180} Some negotiations have already taken place within UN Environmental Assembly, but for now these have been unsuccessful for various reasons. As EU and most other nations push for prohibitions on single-use plastic products as a solution for the issue, as described in the new circular economy strategy\textsuperscript{181}, USA has

\textsuperscript{175} Milios et al. 2019, p. 183.
\textsuperscript{176} EPRO, EPRO Statistics.
\textsuperscript{177} Milios et al. 2019, p. 183.
\textsuperscript{178} Hawkins, Race & Potter 2015, p. 116.
\textsuperscript{180} Koivurova 2014, p. 21-22.
\textsuperscript{181} COM(2020) 98, final, p. 18.
been focusing on recycling approach with its allies. While this has been effective for now, the trend seems to be supporting the lines of single-use plastic bans and according to some the world might still move forward even if there is resistance from single nations.\textsuperscript{182} As the negotiations often take time, the legally binding treaty might still be a decade away. Multiple heads of states have however expressed their views for current negotiations leading to an acceptable treaty in time.\textsuperscript{183} Currently this requires a great amount of work starting from the deciding the actual manner, how to approach the problem, but due to the international ambience an establishment of a treaty can be argued of being likely.

\subsection*{3.2 European Union Policies on Plastic}

The ideas of sustainability and circular use of resources have been actively present in EU policy, for even before the Treaty of Lisbon. The First Environmental Action Programme (EAP) was adapted in 1972 with main idea of the polluter-pays principle.\textsuperscript{184} For example, the European Union Strategy for Sustainable Development from 2001 mentions specifically all of these targets with a various description but does not mention plastic or its relation pollution. However, waste as a concept is linked already to decreasing biodiversity and soil loss.\textsuperscript{185} Similarly, the links between the use of natural resources, the production of waste and the growth of gross domestic product (GDP) was stated and a political goal to break these links was set to place.\textsuperscript{186} This already lays foundation on the later circular economy goals, as the principles are clearly similar.

Plastic pollution, especially in oceans and seas, is first referenced as an independent topic in 2011, when planning a roadway to more sustainable Europe. The political plan presents a vision of more resource-efficient Europe by 2050 with protected ecosystem services to allow the future growth of GDP. This will require turning the produced waste into a resource and also the protection of marine environments of pollutants, specifically of plastics.\textsuperscript{187} The Seventh Environmental Action Plan (EAP) started in 2013 and will last until the end of 2020, with references to previously mentioned roadmap, but it did not have any concrete mentions

\begin{thebibliography}{99}
\bibitem{182} Parker 2019a.
\bibitem{183} Ibid.
\bibitem{184} European Environmental Agency, 1970s.
\bibitem{185} COM(2001) 264, final, 2, 4 & 5.
\bibitem{186} Ibid., p. 12.
\bibitem{187} COM(2011) 571, final, p. 3, 7-8 & 16.
\end{thebibliography}
of plastics. However, in 2013 the Commission continued their efforts relating to the plastics by publishing a Green Paper on the issue. Within this paper were the first policies specifically focusing on marine plastic pollution and plastic’s recyclability, as the directives existing at that point were to be reviewed to be more specifically targeting plastic and imposing more stringent measures of enforcement. The perspectives included waste and chemical legislations at this point.

During summer 2014 a new strategy for circular economy was created starting with a formal communication, which stated the premise for circular use of resources to support sustainable growth according to EAP. In 2015 this new circular economy plan was communicated by the Commission. Circular economy would boost the European economy and competitiveness, while protecting the established industries from resource scarcity and promoting new industrial developments around the recycling and re-use of raw materials. This new action plan included clear goals to plan the economy from more sustainable perspective towards recycling starting already from the design and production of the goods. Specific interest to limit the use of plastic in packaging is mentioned, as is the idea to not just recycle waste, but also re-use it as far as possible. Similarly, all recycling efforts are to be supported by secondary raw material markets, which would have a clear system of rules concerning the recycled materials to further support recycling efforts and investments. In the case of plastics, these efforts are taken even further, as plastics are an issue both from environmental and economic perspectives.

The Commission continued to confirm in 2017 that it pursues for all European packaging to be fully recyclable by 2030, especially in the case of plastic. To achieve the massive goal, EU will be pushing aggressive regulation, but also use softer means, such as economic benefits to achieve its target. Furthermore, the Commission published its view on

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189 COM(2014) 398, final, p. 2-3. This communication was later corrected with COM(2014) 398, final/2, due to typographical and formatting errors. However, concerning this information, it is still relevant.
192 Ibid., p. 3-5.
193 Ibid., final, p. 13.
194 Ibid., p. 11-12.
European Green Deal in December 2019 with even more ambitious goals towards circular economy and climate change.\footnote{COM(2019) 640, final, p. 2.} The targets on plastic are established to create recycling plastic markets by 2030 and to establish further legislative measures on bioplastics and microplastics.\footnote{Ibid., p. 7-8.} In early 2020 the new Circular Economy Plan was unveiled confirmed the plans of the Commission to continue restricting plastics.\footnote{COM(2020) 98, final, p. 6-8.} The Commission also will push for an international agreement on plastics and promote the EU method of targeting this issue internationally.\footnote{Ibid., p. 18.}

### 3.3 The Development of European Union’s Legislative Approach to Plastic Pollution

EU has established multiple political tools for handling the plastic waste, but as pointed out earlier, the Union has also established legislation to further control the streams of pollution in national level as well. The Packaging Waste Directive 94/62/EC was established in 1994 and established a requirement to allow recycling of packaging waste, amongst which the plastics were mentioned in Annex I and were given the organizing numbers 1-19, but the directive did not specifically target the plastic and was more overall waste-focused system.

However, in 2004 the Directive 2004/12/EC of the European Parliament and of the Council of 11 February 2004 amending Directive 94/62/EC on packaging and packaging waste was passed putting on a place prevention on the environmental effect of plastic packaging. Member states are to pursue an increase in re-useable packaging by for example having deposit-systems or other economic benefits or restrictions (Packaging Waste Directive 94/62/EC Art. 5(1)). Required limitations for incineration concerning packaging waste are to be minimum of 50% by the end of 2001 and a minimum of 60% by the end of 2008 (Packaging Waste Directive 94/62/EC Art. 6(1)a-b). For recycling these limitations especially targeting plastic packaging waste are to be 15% by the end of 2001, 22,5% by the end of 2008, 50% by the end of 2025 and 55% by the end of 2030 (Packaging Waste Directive 94/62/EC Arts. 6(1)c, 6(1)e.iv, 6(1)g.i and 6(1)i.i).

In 2013 the Commission proposed a restriction for light-weight plastic carrier bags to be added to Packaging Waste Directive 94/62/EC,\footnote{COM(2013) 751, final.} which was later accepted the Parliament.
and the Council. Specifically, this amendment set a goal to achieve the level of 90 light-weight plastic carrier bags used per capita in 2019 and 40 per capita by 2025 being relevant from single-use plastics point of view. Optionally, the member states can prohibit free distribution of plastic carrier bags by the end of 2018. Very light-weight plastic bags can be excluded from this and sustainable or otherwise ecological plastic bags can have lower restrictions.

The Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste had prohibited the dumping of biowaste and whole tyres in its Art. 5, but it did not have any restrictions on plastic. Comparatively, some member states widened the sphere of this directive to also target plastic in their national legislation, which in practice made plastic transports to landfills illegal. In 2006 Regulation (EC) No 1013/2006 of the European Parliament and of the Council of 14 June 2006 on shipments of waste (WSR 1013/2006/EC) was established to prevent uncontrolled transport of waste. Furthermore, WSR 1013/2006/EC was also establishment of the Basel Convention and its effects to EU legal framework. Late addition to the Basel Convention in 2019, which banned the transport of plastic waste to a third country if not having permission of the nation, is similarly a part of WSR 1013/2006/EC in its Art. 3(2)b and Annex IIIA.

REACH Directive 1907/2006/EC originally did not have any plastic related topics. This directive was later rephrased and there was further establishment, when it came to certain materials, which have dangerous properties. This included some plastics, which had to be specifically marked based on these properties.


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204 PlasticsEurope 2019, p. 31.
205 OJ 12.7.2006 L 190.
207 OJ 22.11.2008 L 312.
recovery system for plastic and according to Art. 11(2)a by 2020 their reuse and recycling percentage shall be at least 50% of total weight of all plastic waste.

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 marine environmental policy (Marine Strategy Framework Directive 2008/56/EC)\textsuperscript{208} was adapted during the same year to respond the decreasing level of marine environment. Within this directive were directions to establish national strategy to protect coastal and further waters, in which litter and pollution were to be specifically evaluated properties, according to Annex III.

Council Regulation (EC) No 1224/2009 of 20 November 2009 establishing a Community control system for ensuring compliance with the rules of the common fisheries policy (CFP Regulation 1224/2009/EC)\textsuperscript{209} established rules for retrieving lost fishing gear. CFP Regulation 1224/2009/EC Art. 48 requires the party, which lost the gear to attempt the recovery of said gear and if this does not succeed, informing authorities in their member state of the event. Regulation (EU) No 508/2014 of the European Parliament and of the Council of 15 May 2014 on the European Maritime and Fisheries Fund (EMFF Regulation 508/2014/EU)\textsuperscript{210} Art. 4 later created European Maritime and Fisheries Fund. EMFF Regulation 508/2014/EU Art. 5(a) specifically states that the fund is to be used on actions to promote environmentally sustainable and socially responsible maritime objectives. In art. 40(1)a removal of plastics from maritime environment and recovery of lost fishing gear are mentioned as possibilities to use the fund.

As it can be perceived, before the SUP Directive 2019/904/EU there certainly were legislation concerning the plastics, but mostly focusing it from waste or environmental aspects and none that would focus the plastic by itself. Previous directives certainly are tools on affecting the plastic waste after it already has been sold to the customer and is about to be either recovered or otherwise discarded. Marine Strategy Framework Directive 2008/56/EC also has tools to remove plastics from the environment, but none of these focuses on the root of the problem, unlike the SUP Directive 2019/904/EU does by removing or restricting the pollutants even before their production.

\textsuperscript{208} OJ 25.6.2008 L 164.
\textsuperscript{209} OJ 22.12.2009 L 343.
\textsuperscript{210} OJ 20.5.2014 L 149.
3.4 Law on Plastic Pollution in Member States

EU has legislation and political frames on plastic pollution, but as the member states are able to form their own policies on the issues, they all have differentiating systems on the matter. These legislations can roughly be divided to those that are rooted to EU legislation and to those that are origin from the member state. The legislative acts often exist to answer the same problems and have often similar legislative structures in differing nations. For example, most European countries have some sort of recycling scheme to achieve the high percentage of recycled plastics, such as plastic collection from households or a deposit system to gather PET bottles and similar. Plastic carrier bags have also been a discussed topic and for example in the Baltic countries normal citizens are using more than 500 plastic carrier bags per year, while in Finland the number is closer to four per citizen, while having no legislation on the issue. At the same time the countries with higher numbers are pushing to lower their numbers with laws, for example France banned certain single-use plastic carrier bags in 2016. Similar actions have been taken in other European nations to lower their use of resources and to protect environment.\(^2\)\(^{11}\)

Actions rooted in EU legislation are varying between countries and articles, as the member states often have multiple ways to achieve given goals. For example, Marine Strategy Framework Directive 2008/56/EC established a need to create a national marine strategy and to achieve the good environmental status (GES) by 2020 for the 23 EU member states that do have marine coastline. According to the report published concerning these strategies only 16 reported their strategy by given date and furthermore, 8 of the 16 countries recognized exemptions in their strategies.\(^2\)\(^{12}\) Concerning the polluting of the coastal waters, while all states in question are notifying of their actions to better their situation, only 6 out of 16 countries expect to achieve GES by 2020.\(^2\)\(^{13}\) Overall, three most successful countries were stated of being the Netherlands, Germany and Ireland, while two with most to catch up were stated of being Poland and Latvia.\(^2\)\(^{14}\)

In comparison, Packaging Waste Directive 94/62/EC was amended in 2015 to include a restriction to light-weight plastic carrier bags with Directive (EU) 2015/720 of the European

\(^{211}\) EPRO, EPRO Statistics.
\(^{213}\) Ibid., p. 11-12.
\(^{214}\) Ibid., p. 18.
Parliament and of the Council of 29 April 2015 amending Directive 94/62/EC as regards reducing the consumption of light-weight plastic carrier bags\textsuperscript{215}, the results were differentiating. In Austria the government saw this to be political agreement to reduce the use of said plastic carrier bags, and with the help of industry and non-governmental organizations decided to cut on the use of such products by 50% by 2019. On the other hand, Luxembourg decided to start taxing all single-use plastics based on this directive and France banned light-weight plastic carrier bags altogether in 2015.\textsuperscript{216}

Below, there is Figure 1 describing comparing the each member states’ legislative situation on single-use plastics in 2018. In it, the single-use plastics are divided to three categories: single-use plastic carrier bags, other single-use and microbeads.\textsuperscript{217} It is clear, that while EU gives certain wider framework on plastic regulation even at this point, the member states have applied different methods on combating the problem of plastic waste. It is noteworthy to point out that all EU countries do have EPR concerning single-use plastic products, even though not mentioned in specifically in the central column.\textsuperscript{218} Similarly, even though there would not be legal requirement concerning specific type of single-use plastic product, countries may have political means to achieve given goals, such as Finland has an agreement between government and industries concerning plastic carrier bags.\textsuperscript{219}

Figure 1. Legal Situation concerning Single-Use Plastics in 2018.

<table>
<thead>
<tr>
<th></th>
<th>Plastic carrier bags</th>
<th>Other Plastics</th>
<th>Microbeads</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>Manufacturing Restriction</td>
<td>Deposit-System</td>
<td>No Restrictions</td>
</tr>
<tr>
<td>Belgium</td>
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\textsuperscript{215} OJ 6.5.2015 L 115.
\textsuperscript{216} Arroyo Schnell, Klein, Gómez Girón & Sousa 2017, p. 7.
\textsuperscript{217} UNEP 2018b, p. 3.
\textsuperscript{218} Ibid., p. 58.
\textsuperscript{219} Ibid., p. 13.
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As it can be perceived, different countries differ widely in their legal framework of considering single-use plastic. Even more varying is the effect of legal codes based on recovered plastics, which can vary greatly in different countries. While having low level of
regulation overall seems to have low efficiency, considering Malta as an extreme case, the widest regulation of France does not seem to achieve similar results with Austria, which seems to have light level of regulation in comparison.
4 ANALYSIS ON SINGLE-USE PLASTICS LEGISLATION

4.1 Pre-SUP Directive Situation in Selected Member States

4.1.1 Selecting Member States

The three countries, which are to be compared in this study, shall be Republic of Finland, Republic of Malta and Kingdom of Spain. This decision was made based on what has been previously discussed in Chapter 3.4 as the countries have comparatively different situations concerning the single-use plastics and waste management as a whole. While this is the main value in the process, to some degree the availability of data and access to laws had minor role specifying further on. Republic of Finland (further on 'Finland') is the northernmost member state of the EU and a part of Nordic countries. In Table 3 (p. 28) it can be seen that Finnish households produce 2595 kilograms of waste per capita, which is comparatively high number, and while this does not categorize only plastics, it is still an indicator. The recycling percent in 2016 was one of the lowest in Table 4 (p. 30) being only 25,4%, but the total recovery rate on the other hand one of the highest being 97,2%. Republic of Malta (further on ‘Malta’) is an island nation located on central Mediterranean Sea. In Table 3 (p. 28), it can be seen that Maltese households produced 1276 kilograms of waste per capita in 2016, which was amongst the lowest numbers. The recycling percent in Malta is 23,5% and total recovery percent 23,7%, both of which are the lowest numbers amongst all member states, when compared to other numbers in Table 4 (p. 30). Kingdom of Spain (further on ‘Spain’) is a country located in Iberian Peninsula between the Atlantic Ocean, Pyrenees Mountains and the Mediterranean Sea. In Table 3 (p. 28), it can be seen that Spanish households are in proximity to European medium in production of waste, as their numbers were 1480 kilograms per capita. When it comes to plastic recycling, in Table 4 (p. 30) it is clear that Spanish have achieved the level of 45,5% and overall recovery level of 61,8% by 2016. From these numbers it can be assumed the legislative systems behind are surely differing.

As established, when discussed the concepts and framework of comparative legal analysis, comparability, methods and functionality have to be first demonstrated. As it has already been stated, Örüçü points out for these to be fulfilled, there are requirements of similarity in both legal question and the answer, understanding the cultural and legal context, and having the methods to actually compare the laws themselves.220 As all the countries are EU member

states and many of these regulations have their foundational basis on EU hard law, their cultural and legal context can be seen as similar. It is however important to remember that in founding differences to perceive them in their cultural and societal context. The question or problem in all of these regulations similarly has its roots tied to the issue of plastic pollution, waste management and environmental concerns. The answers to these issues can still vary, while in multiple cases having their foundations in EU regulation, which offers a view on diverse set of solutions.

To make the comparison in an organized effort, the points of view are divided to these similar categories of plastic carrier bags, plastic packaging, other single-use plastics and microbeads. These categories are viewed in all their stages through design to manufacturing to distribution to end-use. While the analysis often only focuses to legal aspects of these processes, in this case the political aspects and even future developments can be argued of being relevant for having a better picture. In the case of these actions, however it has to be remembered that these are not binding in similar manner as the strict laws would be, but as Örücü points out that as the regulation is just one manner of societal engineering, others should be reflected in true comparison, if they change the manner in which society moves.221

4.1.2 Plastics on Finland, Malta & Spain

To answer the second research question on the implementation of the SUP Directive 2019/904/EU, the preceding situation on plastic legislation on the three compared countries has to be established. This comparison is done via the same system already established in Figure 1 and the compared legislative tools shall therefore focus on the plastic carrier bags, other single-use plastics and microplastics. The category of other single-use plastics is further divided to plastic packaging.

In Finland, the Green Deal: Plastic Carrier Bag Agreement222 fulfills the role set by Packaging Waste Directive 94/62/EC to a degree. Finland has set a required price for plastic carrier bags and plastic packaging and they are further under EPR regulation (Waste Act 48.1,6 § (646/2011, Finnish Waste Act)223). This law requires the agent, which has set these products to markets, to fund waste management and related costs (Finnish Waste Act 46.1

221 Örücü 2007, p. 47.
222 Finnish Ministry of the Environment, Plastic Carrier Bag Agreement.
223 Author Translation. Originally: Jätelaki (646/2011).
§)²²⁴ and that the plastic bags are required to be recycled²²⁵. Very light-weight plastic bags are excluded from this system and are not therefore regulated.

There is also an EPR system on packaging waste, which requires the producer to recover their products after use (Finnish Waste Act 46 § and 48.1,6 §). These producer networks are to recycle at least 16% of all plastic waste starting 2016 and at least 22% starting 2020 (Government Regulation on Packaging and Packaging Waste (518/2014) 8.2,1c § and 8.2,2c §). Finland requires a fee on retail of beverage containers (Act on Excise Duty on Certain Beverage Containers (1037/2004)²²⁶ 1.1 §). However, those included in Palpa or other comparable deposit-system are excluded of this fee (Act on Excise Duty on Certain Beverage Containers (1037/2004) 6.1,1 §). Deposit-based system has been effective way to recover PET bottles to be reused as the rate of recovery has been over 90% in recent years.²²⁷

In Malta, the bags have Excise Duty on them in a form of manufacturing tax, which also is charged from imports.²²⁸ Plastic carrier bags and plastic packaging are to be recovered, reused or recycled without setting a price on customer (Maltese Waste Management (Packaging and Packaging Waste) Regulations Art. 13(2) (Subsidiary Legislation 549.43, MWMR)). Producers are also charged to the degree to cover the costs of administration concerning these products (MWMR Art. 12) Packaging waste has a recovery duty in the form of recycling to 22,5% starting 2018 (MWMR Art. 13(2) & Schedule 3). Malta also requires the packaging to be designed, produced and commercialized in environmentally sound methods making recovery possible (MWMR Schedule 2.1).

Spain has put to place strict regulations concerning plastic bags. There is a tax on the point of sale (5-15 euro cents apiece) and ban of the free delivery of bags on customer. Starting mid-2018 free distribution of plastic carrier bags in prohibited, with exception of very light-weight plastic bags and bags with more than 70% composition of recycled plastic. From 2020 on, plastic carrier bags made of oxo-degradable materials and those with less than 50% composition of recycled materials are banned entirely. Furthermore, starting 2021 light-weight plastic carrier bags and very light-weight plastic carrier bags are prohibited entirely,

²²⁵ UNEP 2018b, p. 42 & 44.
²²⁷ Palpa, Deposit-based System.
²²⁸ UNEP 2018b, p. 29 & 35.
with exception of compostable ones. (Royal Order 293/2018, 18\textsuperscript{th} of May, of reduction of consumption of plastic bags and of establishment of producer registry Art. 4(1)-4(3))\textsuperscript{229} (Spanish Royal Order 293/2018)) Spain also has a compulsory take-back system for plastic producers, in which plastic carrier bags are involved (Act 11/1997, 24\textsuperscript{th} of April, on Packaging and Packaging Waste Arts. 2(1) and 6(1))\textsuperscript{230} (Spanish Act 11/1997). Same law also applies to all producers of plastic packaging, which are to be collected back (Spanish Act 11/1997 Art. 6(1)). Objectives for recycling are set to 15\% and to cut the production of waste by 10\% by mid-2001 (Spanish Act 11/1997 Arts. 5(b-c)). Spanish EPR concerning plastics also contains other products, such as PET bottles (Spanish Act 11/1997 Arts. 2(1) and 6(1)), which makes then a subject of similar practice.

Microbeads have only been discussed in European context for now and have neither legal nor political regulation tied to them. For now, the activity has been limited to European ecolabel for cosmetic products established by the Commission.\textsuperscript{231} Future regulations however seem likely to be established.\textsuperscript{232} However, none of the countries has not yet had any legal developments concerning microbeads.

\textit{4.1.3 Comparative Analysis}

Comparing these methods of regulating plastics is fairly complex process. For example, multiple sources state Finland of being in the lead of cutting plastic bag usage with 4 plastic carrier bags per capita yearly.\textsuperscript{233} On the other hand, average Spaniard uses 133 plastic carrier bags per year\textsuperscript{234} and Maltese use 40 million plastic bags yearly, averaging at 87 per capita.\textsuperscript{235} From this perspective, it could be be stated that Finnish political approach seems to work and as Spain has recently introduced new laws regarding the issue, their recycling rates are expected to be significantly growing in near future. The situation in Malta seems lacking in comparison to legislation.

\textsuperscript{229} Author Translation. Original: Real Decreto 293/2018, de 18 de mayo, sobre reducción del consumo de bolsas de plástico y por el que se crea el Registro de Productores, published: Boletín Oficial de Estado nro. 122, 19.5.2018.
\textsuperscript{232} UNEP 2018b, p. 85.
\textsuperscript{233} F.e. EPRO, EPRO Statistics \& European Commission, Breaking Bag Habits.
\textsuperscript{234} thinkSPAIN Team 2017.
\textsuperscript{235} Xuereb 2009.
Plastic packaging seems to be more or less regulated in EU and all member states studied. However, most of the regulation purely focuses on recovering and recycling plastic products and does not attempt to cut their production. In this the Spanish law concerning the plastic carrier bags was an exception, as similar binding laws were not found on other countries. Comparing Finland and Spain, there seems to be fundamentally different way to perceive the regulation as Finnish governance more heavily focuses on political collaboration between different sectors, while Spanish focuses more on the strict regulation. However, both styles seem to be effective methods of governance in their respective fields and as Malta clearly lack either, it would be beneficial for them to adopt either system. When concerned with the effects of existing regulations and policies, a study conducted by Maes et al. found that while the overall trend of growth was found in plastic products between 1992 and 2017, the number of plastic carrier bags found was significantly decreasing in relation to emerging policies and laws.236

Microbeads and other single-use plastics, such as cutlery, are not regulated on any member state yet and this might be a future development for all of them. As Finland has made the promise to establish such laws in the future and EU is discussing of the topic, this development can be expected to start sooner than later.

4.2 The Development of the SUP Directive 2019/904/EU

In this writing, the main topic is the SUP Directive 2019/904/EU. Proposal for this directive was given a year earlier by the Commission to the Parliament237 and the directive was then accepted via ordinary legislative procedure established in the Treaty of the Functioning of the European Union (TFEU)238 Arts. 192(1) and 294 on 5th of June 2019. The member states are to introduce their methods of adoption by 3rd of July 2021. However, the path to this point started earlier.

The frameworks for the directive were already established in EU action plan for the Circular Economy, which pointed out the need for further re-use and recycling of materials in EU economy.239 Avoiding waste and promoting recyclability in design and production are the

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clear theses of this policy document overall, which sees the plastic as a key type of waste having an entire chapter given to the topic of plastic waste.\textsuperscript{240} Circular Economy Action Plan also references to earlier Green Paper on European Plastic Strategy, which first proposed the idea of EU-wide strategy on the issue. The Green Paper also points out the issue of single-use plastics and their portion on the markets, while pondering on some possible options to cut the curve of their usage.\textsuperscript{241} In 2017 the Commission repeated it target for all packaging in European Union to be recyclable by 2030\textsuperscript{242} and the earlier proposed Plastic Strategy in Circular Economy was communicated by the Commission early 2018. Single-use plastics are stated of being one of the key challenges amongst with microplastics, which are to be focused in international context. To resolve these issues, the Commission proposes heavy concentration on recycling and designing new, more sustainable materials and decreasing the use of plastic in all possible contexts.\textsuperscript{243} As measures to achieve these goals, the Commission proposes measures different means from enlightening the consumers to EPR schemes to clear framework of properties for biodegradable plastics. In these measures can already be seen the hints for SUP Directive 2019/904/EU and its properties, such as the EPR for single-use plastics and set restrictions for biodegradable plastics.\textsuperscript{244}

The proposal for SUP Directive 2019/904/EU was given 28\textsuperscript{th} of May 2018.\textsuperscript{245} There was an impact assessment produced on this proposal and its effects. In the baseline scenario, which does not account the directive it is estimated that the plastic-use, especially in single-use plastics, will increase in future. Being a convenient and cheap option on fragmented market, which is not regulated from border-crossing perspective, customer behavior is not likely to change. At the same time, the waste management systems are unable to properly manage growing streams of discarded materials.\textsuperscript{246} Reduction of discarded plastic items is assessed to reduce greenhouse gas emissions and specifically have tremendous effects on marine pollution. On the other hand, using alternative substances, such as wood could impact the land-use in the form of forestry. There would also be economic costs in both public and private sectors.\textsuperscript{247} Impact assessment recommends banning some single-use plastics and

\textsuperscript{241} COM(2013) 0123, final, p. 3 & 15-16.
\textsuperscript{242} COM(2017) 650, final, p. 3.
\textsuperscript{243} COM(2018) 028, final, p. 3-6.
\textsuperscript{244} Ibid., p. 7-13.
\textsuperscript{246} SWD(2018) 254, final, p. 30-31.
\textsuperscript{247} Ibid., p. 52-53.
voluntarily reducing the use of others. Wider EPR scheme is also supported by the assessment. On the legislative side, the law is preferred of being *lex specialis* and not just modification of other instrument, as there are already some legislation touching some of the aspects, but none which would specifically target the plastic pollution.248 Committee of Regions (CoR) gave its opinion 10th of October 2018, proposing specific clarifications to the text, which would widen its sphere creating possibilities to develop the legislation in future. CoR for example pointed out that biodegradable plastics should not be treated similar to other plastics and that consumer and food safety are not to be compromised in cases of packaging, both of which changes ended up to the directive.249 European Economic and Social Committee (EESC) gave its opinion a week later, supporting the establishment of the directive. They also pointed out that the list containing prohibited or restricted plastic products should be developed based on available alternatives and stricter implementation of polluter-pays principles.250 During the 1st reading of the proposal in the European Parliament, the main consensus was accepting, but the Parliament wanted similarly to have minor changes to the text of the directive. Single-use plastics were to be further defined to avoid problems relating to this and oxo-degradable plastics were to be banned entirely as a part of the process. On the other hand, microplastics are not in this directives sphere and the Commission should find a way to regulate them as well.251 The Parliament also supported the view of CoR concerning biodegradable plastics and preferred to further regulate plastic products used in tobacco.252 The text was compromised between the Council, the Parliament and the Commission on early 2019 and passed to be voted on June 2019.253 As stated, vote passed 5 June 2019 and was published in Official Journal a week later.

4.3 The Contents of the SUP Directive 2019/904/EU
The SUP Directive 2019/904/EU Art. 1 states the objectives of the directive on reducing the effects of certain plastics products to the environment and human health, while promoting

252 Ibid., Arts. 3(16 & 18)
the development of circular economy in the EU. Reasons are further described in the preamble, in which the problems posed by the irresponsibly managed plastic waste to the environment, especially concerning the marine environment. These issues have been further described previously in this thesis and are therefore portrayed here. Most of the negative effects are according to the impact assessment caused by single-use plastics products and to lessen their impact, a legislation is proposed to prohibit their distribution or by other means to decrease their availability. Single-use plastics are therefore to be banned or restricted by this legislation as the most efficient way to better the state of environment.

The directive is *lex specialis* as is described in SUP Directive 2019/904/EU Art. 2, since it is to be applied to single-use plastics, oxo-degradable plastics and plastic containing fishing gear before any other legislation. By 2026 the member states are to reduce the use of single-use plastic products mentioned in Annex’s A Part in comparison to the level measured in 2022. To these products are qualified beverage cups and containers used for food, that are to be eaten without preparation, for example fast foods. The plans of the member states to achieve these targets are to be submitted to the Commission by 3rd of June 2021. (SUP Directive 2019/904/EU Art. 4 & Annex, A Part) All single-use plastic products mentioned in Annex’s B Part are to be prohibited from the market by 3rd of July 2021. Amongst these products are plastic cutlery, straws, balloon sticks and food and beverage containers made of EPS. (SUP Directive 2019/904/EU Arts. 5, 17(1) & Annex, B Part) By 3rd of July 2024, plastic caps in beverage bottles are to be allowed only, if the cap is attached to the bottle until the end of use in units mentioned on Annex’s C Part. This requires standardization, which is to be acquired in EU as a unit and applied when these standards are accepted. Concerning PET bottles, there is a requirement of recycled materials of 25% by 2025 and 30% by 2030. (SUP Directive 2019/904/EU Arts. 6(1, 3-5), 17(1) & Annex, C Part)

The Commission will create a standardized model for information of recycling, which will be added to products mentioned in Annex’s D Part by 3rd of July 2021. These products include tampons, tobacco plastics, beverage cups and wet wipes. (SUP Directive 2019/904/EU Arts. 7, 17(1) & Annex, D Part) EPR will be required of all producers of food and beverage containers, packets, wrappings, wet wipes, balloons, tobacco products and light-weight plastic carrier bags, as described in Annex’s E Part. Producers will be required to enlighten their customers of recycling their products, expenses of collecting these wastes,

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managing their wastes and removal of littering. Similarly, the plastic-containing fishing gear will have the ERP in relation to recovery of such gear and recycling it. These requirements will apply starting 31st of December 2024, with exception of tobacco products, which will be applied starting 5th of January 2023. (SUP Directive 2019/904/EU Arts. 8, 17(1) & Annex, E Part) By 2025 the member states are required to recover 77% of sold PET bottles by weight and by 2030 minimum of 90%. (SUP Directive 2019/904/EU Art. 9(1))


To follow the efforts of each member state and the Union as a whole, the member states are required to yearly submit their statistics of each category. This involves the reduced single-use plastics from Annex’s A Part, collected plastics mentioned in Annex’s F Part, fishing gear put to the markets and what has been collected and of those tobacco products mentioned

256 OJ 22.11.2008 L 312.
258 OJ 7.6.2019 L 151.
in Annex’s E Part’s III sub-part. The Commission will publish a report based on this information. (SUP Directive 2019/904/EU Art. 13) Based on the reports and information, the Commission will publish an analysis of the effects of the directive by 3rd of July 2027, which will be given to the Parliament, CoR and EESC for review. This report will include the found results of SUP Directive 2019/904/EU and if needed, will include further goals for single-use plastics. (SUP Directive 2019/904/EU Art. 15)

As a conclusion, it can be said that the SUP Directive 2019/904/EU develops the single-use plastics regulation in the member states towards sustainable and restricted direction, which has been the goal of the Commission drafting the document.259 Some of the single-use plastics are to be prohibited, some are to be reduced and for some there are standards of EPR put to place. Member states are required to collect most of the PET beverage bottles and enlighten their citizens of their new responsibilities. Next there will be an assessment, how to implement said rules to the national level.

4.4 Achieving the Objectives
According to the SUP Directive 2019/904/EU Art. 1, it is set to prevent and reduce the effects of certain plastic products to the environment and human health in manners, which support the transfer to circular economy. Simultaneously, it is a part of larger transformation of economy from unsustainable sources towards more sustainable one. As stated, the EU has been a laboratory for future policies, which policies have been followed outside as a guiding element.260 EU has informed of its willingness to lead a pursuit for an international treaty on single-use plastics261 and its view has been focused on eliminating most polluting plastics entirely rather than concentrating to more efficient recycling.262 As the directive is adopted to national legislations and its effects are seen, the world is likely to observe closely, when drafting an international treaty on the issue.

Mechanically solving the issue of plastic pollution by legislation and if such legislation can be effective have to be reflected first. EU produces around 60 million tons of plastics yearly, which concludes proximity to 20% of the world’s yearly production.263 Of this amount it is

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262 Parker 2019a.
estimated that 500,000 tons leaks to the environment yearly. In comparison, Weis argues that 6.5 million tons of plastic leak to the marine environments yearly, putting the EU share to around 7.6% of the world’s plastic pollution. The SUP Directive 2019/904/EU has picked a group of products to restrict, which together compose 70% of all found waste in the sea. If this would be achieved successfully, the entire world’s plastic polluting would be decreased by 5.3 percentage points. While this is not such a large number, in 10 years it would mean approximately 3.5 million tons of plastics not ending up in the oceans. This number is also comparable to the Amur River, which is the world’s 10th largest source of plastic pollution. It also has to be recognized that by reducing the creation of new plastics, less oil is being used to create such materials, which reduces the greenhouse gas emissions of the plastic industry. Thus, it can be argued that a possible success would have tremendous effects purely by itself and if such manners would be adopted elsewhere, the environment would be even less polluted.

From social point of view, it has been argued that the behavior change of the humans is the largest variable within the change relating to the single-use plastics. On the other hand, this view has been criticized for its simplicity facing a complex, wicked problem and due to lack of evidence supporting these claims. Even if the practice to raise public awareness on recovery and recycling would be applied, it still would not respond the issue of creation of plastic waste. On the contrary, simple solutions do not exist, according to van Veelen and Hasselbalch, and the field requires further research to make any final conclusions. However, the citizen behavior is definitely an affecting element and it has been stated that public perception and legislation are reflecting each other. Thus the laws of society can be seen reflecting the public behavior and perceptions of the problem. The existence of plastic regulation suggests that citizens support such actions towards the plastic pollution.

265 Weis 2015, p. 42.
267 Author Calculations.
268 Jefferson 2019, p. 3.
269 Ibid., p. 6.
270 Wicked problems refer to multidimensional, interrelated and ambiguous problems in society, understanding which is poses a challenge and which do not have a simple solution. Most of the proposed solutions often create further problems in line. See, Raisio, Puustinen & Vartiainen 2019, p. 3-6.
271 van Veelen & Hasselbalch 2020, p. 2.
272 Ibid., p. 2-3.
Achieving the objectives based on given legislation thus becomes the question. As stated, the legislation has the support from the people and its mechanisms, if achieved do have effect on the problem posed. SUP Directive 2019/904/EU prohibits the use of certain plastic products and oxo-degradable plastics from the markets entirely and therefore removes their increasing environmental effect by 2021. (SUP Directive 2019/904/EU Art. 5) Similarly, as stated by Finnish Ministry of the Environment, the restriction to removable plastics caps and lids in beverage containers mentioned in Annex’s C Part, should be understood as a prohibition of not qualifying products in the market (SUP Directive 2019/904/EU Art. 6(1)). As these bans are comprehensive and do not allow for exceptions, it would be extremely unlikely for them to fail. The reduction of plastic materials from Annex’s A Part does not have specific goals for the member states to thrive towards. However, the terms used to describe this are “an ambitious and sustained reduction” and “a substantial reversal of increasing consumption trends” by 2026 compared to 2022. (SUP Directive 2019/904/EU Art. 4(1)) Based on this, it has to be argued that the targets describe a situation, in which the levels of consumption are lower in 2026 than 2022 and further decreasing. This is also linked to the Union waste policy and law, which require the member states to have at least a 50% level of reuse and recycling in plastics by 2020 and most likely growing further on (Waste Framework Directive 2008/56/EC Art. 11(2)a). As the use of said products will decrease and their reuse and recycling rates grow, it can be stated that their impact on the environment will decrease as well.

By 2030, it is required that all bottles made of plastics will have at least 30% of their materials from recycled materials (SUP Directive 2019/904/EU Art. 6(5)). From environmental perspective this would mean 30% less oil being used to create said bottles, but it also has circular economy effects. To gain that 30% of the plastics needed, the demand for recycled plastics will raise in the EU and promote recycling even further. Similarly, the EPR requirements for certain plastics push the producers both to develop the systems of recycling and reuse increasing the markets for plastics and at the same time reduce their effects in the environment, as more plastics end up to being recycled. (SUP Directive 2019/904/EU Art. 8) The separate collection targets of also reduce the plastics ending up to the nature, while similarly add more recycled plastics on the markets supporting the circular economy (SUP Directive 2019/904/EU Art. 9). The support for the development of circular economy

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economy thus exists and it is simultaneously helping the efforts in the environmental protection.

The effect of the markings in the plastic products (SUP Directive 2019/904/EU Art. 7) and awareness raising measures (SUP Directive 2019/904/EU Art. 11) are supporting measures to further support the recycling and reuse effects. The information gathering and publications also have an effect further than just following the development of specific nations, as they also raise awareness of the situation in different nations and can affect to national policies and legislation. Information disclosure policies have been linked to better voluntary actions by corporations and it is likely for the nation states to behave similarly.\textsuperscript{275} By publishing data on the actions of the member states, the EU will indirectly support further national acts to more efficiently tackle the plastic pollution and even more decrease its effects on the environment.

It is noticeable that none of the presented actions will specifically target the bettering of human health or mention it, even though it is stated as one of the targets of the directive (SUP Directive 2019/904/EU Art. 1). In SUP Directive 2019/904/EU Preamble 5 it is mentioned that plastics in the environment are a threat to human health. The claim is further repeated in Preamble 25, 29 and 36, but no reasoning is given. In Preamble 19 it is stated that dangerous chemicals within women’s sanitary products should be further regulated within the range of REACH Regulation 1907/2006/EC, but this is the only mention of specific goals and it is specifically mentioned of not being within a scope of this directive. It could be reasoned that these claims are based on microplastics in human environment and to lessening of their effect to human health, by reducing the amount of plastics in the environment overall. However, it must be stated that according to WHO, there is not yet sufficient evidence to prove that microplastics would be harmful for human health.\textsuperscript{276} Therefore, it has to be argued that for now, that the directive cannot be claimed to better human health according to current scientific understanding.

SUP Directive 2019/904/EU has been perceived from the points of view of mechanical, social and legal points of view. The first question on the effectiveness of the directive is according to the argumentation supported form its environmental and circular economy aspects. The environment will be better due to the directive and the circular economy will

\textsuperscript{275} Kraft, Stephan & Abel 2011, p. 5-7.  
\textsuperscript{276} WHO 2019, p. 64-65.
develop due to the actions presented in the directive. The human health aspect cannot be claimed to be supported based on current understanding on the effects of plastics in human bodies. However, after scientific knowledge is increased, the questions should be re-evaluated based on found answers. Considering the further development of the directive on the issue of health should be done after a scientific certainty has been reached.

4.5 Criticism & Other Possible Problems

For all its reforms, the SUP Directive 2019/904/EU has not been able to avoid criticism from different parties. As often is a case with a new legislation, some parties argue that the new rules are too strict and on the other hand some would want to have even more legislation on the issue. In this chapter, some the criticism towards the directive is discussed and analyzed for their further implications, as the legislation is always on change.

For some, the directive has been too loose and does not address the problem of marine plastic pollution to a degree required. Small plastic pellets with sizes varying from 1mm to 5mm have not been prohibited in cosmetic products, allowing the microplastics still to be leaked to the environment. At the moment, the European Chemical Agency is investigating the best manner, which to use to reduce the amounts of microplastics in the environment. While the EU is possibly creating legislation on the issue in future, but SUP Directive 2019/904/EU might have been a possible way to prohibit some the usages of such materials, as it clearly has a framework for prohibiting certain materials and products. There is neither economic strings to reduce the production or use of petroleum-based plastics overall. Even the reductions mentioned in SUP Directive 2019/904/EU Art. 4 do not have any binding targets for member states, solely the need for reduction. The directive is neither tackling the issue of littering, but only the materials most often in products ending up as litter. The averagely favored status of purely plastic-composing products might even cause increase in plastic use, as these products are easier to recycle. There is also the problem of defining the plastic product, as at the moment, there is no specific understanding that at which point mixed material product turns to plastic product and at which point it is not a plastic product.

277 Porta 2019, p. 7.
278 European Chemicals Agency, Reducing microplastic emissions by 400 000 tonnes over the next 20 years.
279 UNEP 2018b, p. 85.
280 Porta 2019, p. 7.
281 Swedish Forest Industries, Less renewable material when EU wants to reduce single-use plastic.
Similar issues raise from the definition of “intended immediate consumption”, which could be seen differently.\textsuperscript{282}

Other major argument concerning the issue has been that the plastics themselves are not the problem, rather the littering and lack of recycling cause the issues related to plastics.\textsuperscript{283} This was also the most often stated argument during the debates on Plastic Strategy in the Parliament from those who were against further regulating plastics.\textsuperscript{284} Similarly, the USA has been a major supporter of this perspective in international negotiations, while the rest of the world has mostly seen the problem in production and use of single-use plastics.\textsuperscript{285} A large quantity of the European plastic waste is also transported to the third countries, which often have less regulated waste systems and promoting recycling and creating more efficient markets for waste in the Union might be more efficient way in cutting the amount of waste ending up in the environment.\textsuperscript{286} According to many, cutting plastics out of single-use does not solve the actual problem of littering, but rather just transfers it to other materials.\textsuperscript{287}

The criticism from the plastic industry has also been focusing on this perspective, as according to them the prohibited and restricted products mentioned are chosen arbitrarily and more efficient manner would be to increase the level of recycling. European Plastic Converters, a union of plastic recycling industry, calls the directive as a mistake and discrimination of plastic as a material foreseeing an economic impact to the industry and a loss of jobs. This union has been outrageous for the lack of cost-benefit analysis on development of the SUP Directive 2019/904/EU.\textsuperscript{288} PlasticsEurope as a voice of plastics producers has been alternatively a landfill ban for plastics and wider EPR systems, similar than with PET bottles.\textsuperscript{289} From this point of view, the requirement to recycle PET bottles mentioned in SUP Directive 2019/904/EU Art. 9 is an efficient way to target the root of the problem and more efficient recycling might be a substitute for restrictions of products themselves. One of the loudest criticism has been stated by Oxo-degradable Plastics Association (OPA), as the oxo-degradable plastics are to be entirely banned in the EU. OPA

\textsuperscript{282} Finnish Ministry of the Environment 2019:26, p. 66-68.
\textsuperscript{283} Swedish Forest Industries, Less renewable material when EU wants to reduce single-use plastic.
\textsuperscript{284} Mederake & Knoblauch 2019, p. 6.
\textsuperscript{285} Parker 2019a.
\textsuperscript{286} Schweitzer & Sigalou 2018.
\textsuperscript{287} F.e. PackagingEurope, Banning individual plastic products is ineffective., Parker 2019a & Schweitzer & Sigalou 2018.
\textsuperscript{288} Messenger 2018.
\textsuperscript{289} PlastEurope.com, Single-use Plastics.
argues that prohibiting oxo-degradable plastics in SUP Directive 2019/904/EU Art. 5 is against REACH Regulation 1907/2006/EC Arts. 68-73, which state the need for scientific knowledge before banning any substance from the markets. OPA is not convinced of the evidence presented of the harmfulness of these substances and according to sources are willing to continue to the court with this issue. It is yet to be seen, if OPA is able to overturn the decision to remove the oxo-degradable plastics and if they even continue to pursue the issue.

Criticism has also been pointed to the bioplastics as a solution for petroleum-based plastics. The amount of natural resources required to establish the networks for producing supply for a demand of plastics in the markets would require substantial increase in production of biomass. This might mean either more deforestation or replacing food production with other materials used for creating bioplastics. Biodegradability might also change the consumer behavior to more unsustainable direction and reduce the recycling rates, as people could perceive throwing plastics to the environment as a lesser evil than before. Problems might also be rising from the food industry, which global supply chains are reliant of plastic packaging. Plastic packaging of food uses up to 20% of global demand of plastics, which has been an efficient way to achieve longer shelf-life for food.

Cutting plastics and the movement to press legislation on the issue have also received some criticism overall. While plastic pollution is definitely an important topic, it has been criticized of moving the attention of the society from larger issues of climate change, the loss of biodiversity and mass extinction of species to a “secondary problem”. Viewed as a red herring by some authors, the plastic pollution is recognized as a problem, but not as the problem. Plastic reduction might also have some undesirable economic effects. As the demand of oil will reduce due to reduce in plastic manufacturing, the investments in renewable energies might be threatened, especially when it comes to transportation infrastructure, and slow the shift to more sustainable energy. In 2019 British Petroleum oil company even proposed that reduction of plastics might lower the demand by millions of

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290 PackagingInsights, The EU single-use plastic ban: Industry responses are in.
291 Schweitzer & Sigalou 2018.
292 Ibid.
barrels a day,\textsuperscript{294} which could possibly push the oil futures down for a decade and similarly reduce the willingness to invest to renewable energy.

Overall, cutting plastics from society has been received with mixed views. On the other hand, the EU approach has been seen reducing plastics entering to the ecosystems, thus improving the quality of environment, especially concerning the marine environments.\textsuperscript{295} However, the goals of the directive still lack in some areas, such as concerning microplastics and solid targets for member states. These could also be seen as points of development to add more stringency to plastic regulation and to increase the effectiveness of SUP Directive 2019/904/EU. At the same time, the industry sees the regulation as a problematic, and while some of the arguments might be due their interest, they should not be ignored only due to this. Cutting plastics might require a shift in society to change behavior and attitude towards single-use products, not solely on plastics.

4.6 Implementation of the SUP Directive 2019/904/EU

4.6.1 Overall view to the Implementation

Implementation of the directive references to transferring the goals of said directive to the legislation of a member state. First of all, the Commission has not yet created guidelines for the implementation of SUP Directive 2019/904/EU and they are expected to be ready by July 2020.\textsuperscript{296} However, due to the recent COVID-19 pandemic, it is possible that the publication of the guidelines will be pushed to a later date in autumn. To clarify the possible means of implementation, there are certain possibilities mentioned within the directive guiding the possible methods. SUP Directive 2019/904/EU Art. 4 proposes for example national targets and marketing limitations to reduce the plastic products mentioned in Annex’s A Part. Similarly SUP Directive 2019/904/EU Art. 9(1) offers two different possibilities to fulfil the responsibility of separate collection. Unfortunately, these are the only parts, in which such propositions exist and for further knowledge other documents have to be referenced.

\textsuperscript{295} Penca 2018, p. 200.
The Commission working staff document on implementation was published with the proposal for SUP Directive 2019/904/EU. Unfortunately this document rather focuses to the costs, effects and outcomes of the implementation instead of giving actual proposals for possible means of actual implementation. On the other hand, for example banning certain products does not have multiple alternative possibilities from which to choose the exact method. Requirements for certain plastic products mentioned in SUP Directive 2019/904/EU Art. 6 are also having a little room of differentiation between member states. Marking responsibilities set by SUP Directive 2019/904/EU Art. 7 will be further given by the Commission at a later date to the member states and will be harmonized in all countries. EPR for single-use plastics producers mentioned in SUP Directive 2019/904/EU Art. 8 offer some variation between countries, as the exact manner of how that system will work is on the hands of the states. However, in all member nations the rules already exist in other products and as the legislation on EPR is comparable to Waste Framework Directive 2008/98/EC Art. 8 and Packaging Waste Directive 98/62/EC Art. 4(1), the systems should similarly be compatible by their national rules as well.

As mentioned, SUP Directive 2019/904/EU Art. 9 offers two possibilities to achieve the set targets either by deposit-refund scheme or having separate collection targets of different products within this category. Enlightenment by the state regulated by SUP Directive 2019/904/EU Art. 10 can be done through various ways and has not any differentiating rules concerning their manner. SUP Directive 2019/904/EU Art. 17(3) specifically mentions that the targets of single-use plastic reduction and EPR systems can be issued through treaties between the state and economic sectors, if the treaty is legally binding and fulfils all mentioned restrictions.

As described in a report of Finnish Ministry of the Environment, the directive does not allow much national leeway concerning the implementation of the directive. There are certain possibilities to enact the rules to national law in culturally appropriate manner and to adapt previously established laws, but mostly the directive only has strict regulations. To explain these differences and to focus on the different possibilities of implementation, the next part will discuss this in the context of previously mentioned selected member states.

4.6.2 Possible Manners of Implementation in Selected Countries

SUP Directive 2019/904/EU is to be implemented by 3rd of July 2021 to national legislation in all member states. However, only the prohibitions mentioned in Art. 5 and the markings required in single-use plastic products from Art. 7(1) will be in effect from this point on. The regulation of tobacco products referenced in Art. 8 shall be on effect by 5th of January 2023. The restrictions concerning beverage containers from Art. 6(1) will be effective by 3rd of July 2024 and EPR on single-use plastics referenced in Art. 8 will be on effect by 31st of December 2024. The member states are to produce their plans to put the directive in effect and provide these plans to the Commission as soon as possible. (SUP Directive 2019/904/EU Art. 17(1-2)) To answer the second research question, the possible manners of implementation in different member states are to be recognized and their potential discussed, especially considering the possibility to implement similar legislative or political acts in third countries to respond the same issue.

From Finland there is already the governmental document published by the Ministry of the Environment considering the possibilities of implementation.299 As there is already existing legislation considering the plastic waste, the targets focusing on purely this point of view from the directive could be amended to existing legislation. The government document ponders these possibilities to adapt all the possible changes to already existing legislation. As EPR system is already at place in plastic packaging, it is suggested that two overlapping systems of EPR should not be created, but rather the single-use plastics should be added to the existing framework.300 The targets the could be then supplemented with further governmental regulation, as has been done with plastic packaging.301 As reduction efforts of SUP Directive 2019/904/EU Art. 4 do not have a strict measures, it is argued for further Green Deal agreements to be made with the industry on the mentioned products.302 However, those might still have some problems, as the deals between the government and the producers are not seen as legally binding according to the law, which is one of the requirements, if this is chosen as the way to target the issues. This would require legislation allowing this kind of treaties.303

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300 Ibid., p. 25-26. Referencing to the established EPR systems based of FWA 46 § and 48.1,6 §.
303 Ibid., p. 161-162.
The prohibition of o xo-degradable plastic products and others mentioned in Annex’s B Part has not yet been framed in any existing legislation and the government review suggests adding these to product legislation, instead of waste legislation as it would make the monitoring easier for national actors.304 Similarly, the allowing of only those beverage containers in the markets, which caps remain attached during the product’s intended life-cycle, can be seen as a ban for those containers, which do not fulfil this requirement. Law has multiple requirements set to place for differing products and adding this could be done similarly.305 The PET bottle collection is in its current level already acceptable and fulfils even the further goals, the possible development of reporting is suggested, but seen as not imperative for been decent.306 The requirement of recycled plastic in PET bottles is not yet in place, but could be added as an amendment to Finnish Waste Act or other laws.307 Considering the tobacco products, as a treaty between producers and the state is not allowed, strict laws have to be put in place to reduce the effects of discarded tobacco products in the environment. The costs are suggested to not radically chance the price of smoking and to further limit the littering, more strict legislation on littering is proposed.308 Furthermore, in national level it is suggested adding stringency to the law on littering and developing the responsibilities relating to it.309

In Malta, the current Waste Management Plan is about to run out at the end of the year and a new plan is currently been created to carry until the end of 2030.310 The current plan was not able to achieve the targets set to it, which the government saw as a problem of new practices, which were not able yet to achieve their full potential.311 Along with the new Waste Management Plan, Maltese Ministry of the Environment, Climate Change and Planning (MECP)312 has been developing a single-use plastics strategy and reinforcing its EPR schemes.313 To answer the lack of practical recycling possibilities, Malta has been

304 Finnish Ministry of the Environment 2019:26, p. 82.
305 Ibid., p. 87.
306 Ibid., p. 91.
307 Ibid., p. 88-89.
312 Maltese Ministry of the Environment, Climate Change & Planning (MECP) started by that name 15.1.2020. Until that point it was known as Ministry of the Environment, Sustainable Development & Climate Change (MESDC) and before 9.6.2017 as the Ministry of Sustainable Development, the Environment & Climate Change (MSDEC). In this paper, all previous forms are all referenced as Ministry of the Environment, Climate Change & Planning, which should be noticed especially in sources.
announcing its plans for large investments to waste management sector and for a complete legislative ban of single-use plastics starting 2021.

The Single-Use Plastic Products Strategy for Malta proposes measures for different single-use plastics and is also a guiding document for the implementation of SUP Directive 2019/904/EU, although the directive had not been accepted at the point. MECP report proposes prohibiting oxo-degradable plastics by 2021, establishing beverage container scheme by 2020 and prohibiting all single-use plastic food containers and replacing them with multi-use or alternative material ones during the 2020s. Tobacco producers should monetize ashtrays in beaches and other public areas by 2022 and starting 2023 they are to have an EPR system for filters. All single-use products should have differentiated collection facilities placed on marinas, hotels and other similar private venues. PS in fishing gear is to be highly restricted by 2022 and by 2024 an efficient EPR system should be at place concerning all fishing gear made of plastics. Overall, the strategy contains all of the reduction and prohibition goals set by the SUP Directive 2019/904/EU and Maltese government has endorsed the strategy pursuing its target legislatively. Unfortunately any concrete methods of amending the legislation have yet to be mentioned in the document or otherwise. The strategy contains some targets, which clearly require amending the MWMR, such as the targets to cut all extra plastic packaging, but some of the legislative actions would likely be created within their own laws, similar to MWMR.

For now, Spain has not published an updated plan concerning the plastic waste and prevention of such, or any other roadmap according to which the SUP Directive 2019/904/EU could be adopted. For the sake of speculation, it could be argued that as the government of Spain has not previously had deals with private actors, it is unlikely to establish new ones. Furthermore, the acts of strong regulation on plastics suggests strict regulations in the implementation of this directive too. The takeback system introduced in Spanish Act 11/1997 is likely to be widened and the beverage bottles are to be differentiated

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316 MECP 2019, p. 9 & 23.
317 Ibid., p. 27-28.
318 Ibid., p. 29.
319 Ibid., p. 32-33.
320 Ibid., p. 33.
321 Ibid., p. 36.
322 Ibid., p. 29.
from other plastic waste. Spanish Act 11/1997 also establishes different requirements for recycled materials, which are should be updated along the lines of SUP Directive 2019/904/EU. Some of the targets are likely to require new legislation, such as the fishing gear requirements and tobacco products.

At the moment, none of selected countries have yet established legislation based on the SUP Directive 2019/904/EU or even created proposals for such laws. Two of the three have established roadmaps or plans to achieve the targets. They have proposed some possible alternatives on fulfilling the required goals and even some manners, which could be used to take the goals even further nationally than is demanded. It is likely that by the end of the year, the member states have created their first proposals for their national parliaments or alternative bodies, as the laws are to be place by July 2021.

4.6.3 Reflections relating to the Third Countries
As Nelken points out, laws are often society’s answers for problems and due to this the laws are similar in all cultures, in which the same problems exist. As it has been established during previous chapters, the plastic pollution is an international and cross-borders issue, which cannot be solved in one nation or region only. While there is no silver bullet to any problem, by legislation it is possible to affect the behavior of citizens and reduce the harm this problem is causing be it in national or regional level. As the international regulation is lacking, the legal transplants from one region to other might be a solution to the same issue in different environment, if done correctly. Rich Europe has been able to be a laboratory for different laws and policies, which have been later copied to other regions of the world after they have been proven to be successful. Even failed trials could be an excellent method of learning, how legislation can be developed to be more efficient. For example, the EU emission trading scheme in its early phases was not able to achieve its ambitious goals, but by development it has developed and nowadays it can be model for other nations willing to establish such a system.

It is notable that in this point the scheme is still within its early stages and possible results will reveal if and how it could and should be transferred to other regions. For now, the

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question lies more within in the created solutions for meeting the targets and the effectiveness of the directive as a solution to the problem it is established to solve. It is also noteworthy to remember that all nations in the world do not have similar resources, when it comes to effectively managing legislation and enforcing the methods. EPR methods might be a solution in regions, where the government does not have resources to take care of the problem by themselves. This does have the requirement of supervision, but that could be monetized with the costs of EPR to the producers. EPR also would establish the idea that the responsibility of the waste belongs to the producer of said waste and not transfer it to their customers, whose controlling could be seen more difficult. The government agreements with the industry might be an affordable solution to reduce the use of some plastic products without strict laws and heavy monitoring, allowing industry self-regulation.

Bans on plastic products as a concept are more complex to create as plastics are fairly cheap material and alternatives could be therefore too expensive for the markets. Further regulation of the products might also be a complex issue, as the possibilities for supervision vary. On the other hand, oxo-degradable plastics are a threat to the environment and thus their ban would be an efficient way to reduce the pollution. On the other hand, if managed properly, a strict ban will completely shut down the leakage of said product to the environment.

In the end, the products in the market are used by the customers and individuals, whose behavior affects the actual leakage of materials to the environment. From this perspective, the informing of the citizens of the effects to the environment should be done to reduce the effects of all littering. On the other hand, this requires proper recycling or recovery possibilities, but an informed citizen is at least more likely to demand them from their government. Finding the exact solution for each nation depends of their situation and, as mentioned in the beginning, the effects of this directive can be further seen, when some time has passed, and results will be available.

4.7 Future Developments

It is difficult to predict, how plastics will change in future. New technologies and products could possibly change our entire behavior concerning these materials and shift the consumer actions. For example, the studies on health effects of microplastics will be on a relevant role, when big decisions are made. Similarly in European level, the actions of OPA might cause a change in existing legislation of oxo-degradable plastics, if their negative effects cannot
be proven. However, some future actions can already be seen based on policies, decisions and made promises.

The European Green Deal\textsuperscript{328} and New Circular Economy Action Plan\textsuperscript{329} were published during the writing process of this thesis. Establishing the way for future developments in EU environmental policy, both documents had targets and policies relating to the plastics and outlined the future approaches towards them. Green Deal promises re-evaluation of European Plastics Strategy from 2018 and further legislation on microplastics. Regulatory framework for bioplastics and biodegradable plastics will also developed even further and single-use plastics will be regulated more. There are also hints for a possible tax for unrecycled plastics waste proposal.\textsuperscript{330} According to this, it is not a great leap to assume that SUP Directive 2019/904/EU might be re-evaluated as well during the process and the goals of 2030 might change to more stringent ones. In New Circular Economy Action Plan, there are also suggestions of further minimum requirements of recycled materials in products, establishing regulation on microplastics and creating common guidelines for bio- and biodegradable plastics. The Commission will also push for scientific knowledge of the harms of microplastics in the environment and human bodies. EU will be pushing an international treaty on plastics and especially single-use plastics promoting the circular economy approach to plastics.\textsuperscript{331} This enforces the idea on further regulation and additions on the directive, as many of the proposed actions could be added to the SUP Directive 2019/904/EU without a problem, since it is Lex Specialis and already the most comprehensive legislative tool on the field.

The international treaty on plastics might be a future development as well. This could also affect the European practices, in which the plastic politics is conducted. Similarly, the treaty might loan large parts from EU legislation, as EU has been taking a role as a global leader on the issue and has been working as the laboratory of policies, as mentioned. From the point of view it will be interesting to see, which direction the future treaty takes or if the negotiations fail.

\textsuperscript{328} COM(2019) 640, final.
\textsuperscript{329} COM(2020) 98, final.
\textsuperscript{331} COM(2020) 98, final, p. 9-10 & 18.
5 CONCLUSIONS

Plastic pollution has been receiving global attention and this has created a dedicated group from different fields supporting international regulation to reduce the effects of plastics on the environment. The pictures of dead birds, dolphins and whales have brought the problem visibly to the lives of the public, perhaps more so than other international issues. Microplastics in water have raised discussion of the health risks for humans and the environmental harms putting pressure to the governments to act in national level and simultaneously to push global action on the issue. While plastics regulation has been receiving criticism concerning its alternatives, the effects on oil prices and freedom of trade, overall it could be argued that in future an international treaty on the issue is plausible.

SUP Directive 2019/904/EU is globally measured clearly one of the most stringent legal acts on plastic pollution focusing on the most common plastics found on the environment. Its efficiency towards the environmental goals is undisputed, as it specifically targets the most problematic groups of plastics. It also clearly supports the European Circular Economy by adding both supply and demand in recycled plastics furthering the goals of achieving fully recycling-based economy. The goals based of human health are for now lacking scientific evidence and by both adding to the existing knowledge and creating more clearly limited goals, the directive could be bettered in this aspect. The environmental aspects could possibly be enhanced by adding the problematic microplastics in its sphere and by more consistently defining the required properties of bio- and biodegradable plastics. These changes are probable in close future based on recent EU announcements.

Comparing the EU member states’ plastics regulation, their levels of development differ. The focuses on preventing, recycling and recovery have created multiple models of targeting plastic waste. However, due to EU legislation, all member states are view as successful compared to the global medium, which also might relate to the harmonized laws and richness in resources. Finland, Malta and Spain have had different points of view, but have been recently all moving towards similar targets. SUP Directive 2019/904/EU does not have multiple possible ways of adoption, which predicts comparable implementation with small variations. The most loanable aspects from this package to the legislative systems of other regions are EPR due to its low costs and complete banning of product types due to easy monitoring.
SUP Directive 2019/904/EU fulfils its goals of being the first principle tool in a fight against plastic pollution. The future developments of the directive are probably formerly mentioned goals of adding microplastics to the sphere of regulation. The actual effect can only be estimated at the moment and further studies should be done after the implementation, when statistical data comes available. The development of international regime might have effects on the SUP Directive 2019/904/EU, but interesting prospect is also the mirrored scenario. As the EU will be an international leader due to more isolationist and protectionist behavior of USA and low interest of other parties to take the lead, the formation of the regime might be negotiated with fewer parties. It remains for future to see, if this might happen and what would be the political implications.