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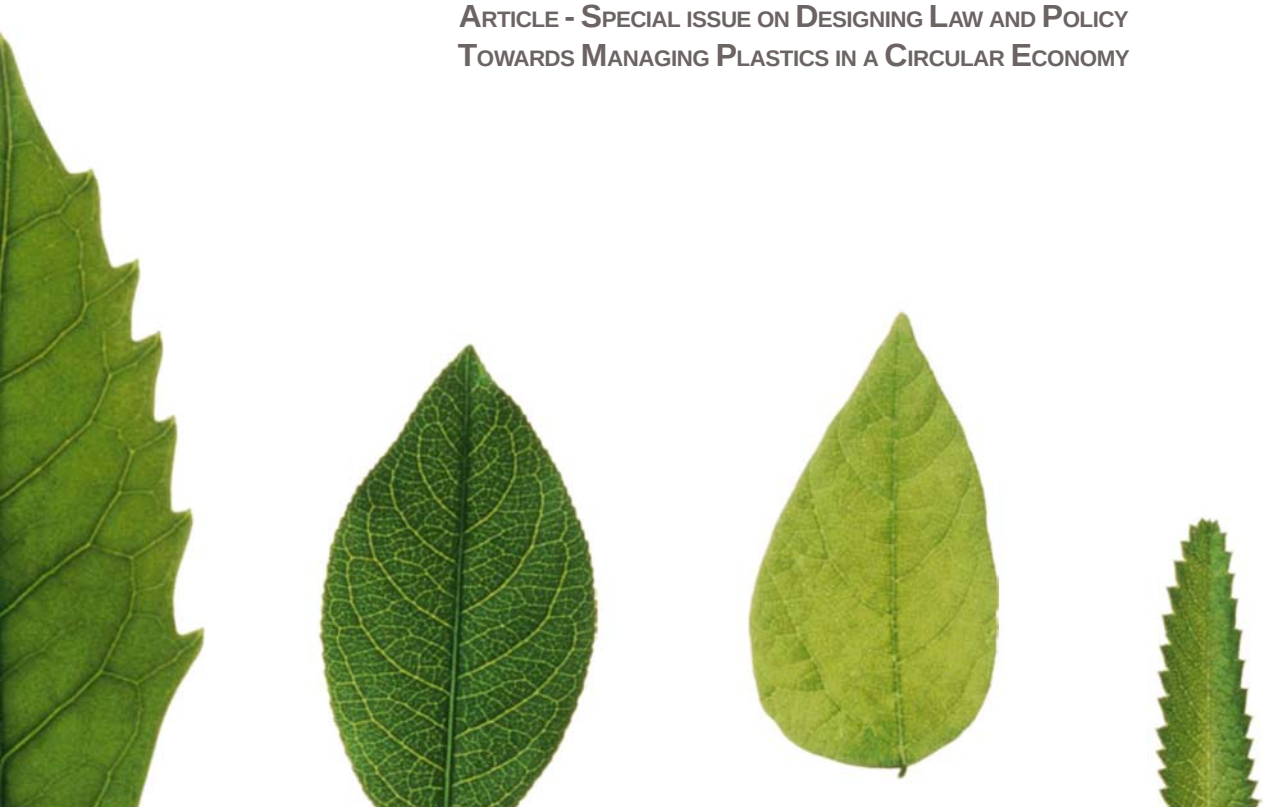
Article - Special issue on Designing Law and Policy Towards Managing Plastics in a Circular Economy



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1 INTRODUCTION

The issue of plastic waste has recently gained traction, attributed in part to images of the impact of plastic waste in marine ecosystems shown in BBC's and Sir David Attenborough's *Planet Earth II*[1] series and other headlines reporting on, for example, the Chinese ban on the import of certain plastic wastes[2] and the environmental costs of plastics in fast fashion.[3] Much data exists to warrant the growing concern about plastic waste. Jambeck and others calculate that 4.8 to 12.7 million metric tonnes of plastic waste flowed into the oceans from coastal regions in 2010, which is only expected to have increased since then.[4] Furthermore, there is evidence that this plastic waste ends up in our food chains and is ingested by us, with the overall human health implications of this still unclear and requiring further research (though there is initial evidence that certain plastic waste can have harmful effects).[5]

Beyond environmental and social repercussions of plastic waste, there are also huge economic costs: the report *Valuing Plastic* estimates the cost of environmental damage to marine ecosystems by plastic waste at around US$13 billion;[6] the Asia-Pacific Economic Cooperation calculates the cumulative cost of plastic waste in the Asia-Pacific oceans at US$1.3 billion to local tourism, and fishing and shipping industries;[7] and the European Commission states that the potential costs for coastal and beach cleaning in Europe could reach EUR630 million per year.[8]

The plastic waste crisis can in part be addressed through effective waste management (though other critical issues, including, *inter alia*, the scale of plastic consumption and the composition of certain plastics also need to be addressed, but are beyond the scope of this article). A circular economy approach to plastics has been recommended to improve plastic waste management to prevent plastic waste being 'wasted'.[9] Many circular economy definitions are in circulation. In essence, it is a system based on the reuse, recycling, and recovery of materials to achieve economic

1 Sid Hayns-Worthington, 'The Attenborough Effect: Searches for Plastic Recycling Rocket after Blue Planet II' (*Resource*, 5 January 2018) <https://resource.co/article/attenborough-effect-searches-plastic-recycling-rocket-after-blue-planet-ii-12334>.

2 Eg Laura Parker and Kennedy Elliott, 'Plastic Recycling is Broken. Here's How to Fix It' (*National Geographic*, 20 June 2018) <https://news.nationalgeographic.com/2018/06/china-plastic-recycling-ban-solutions-science-environment>; Karen McVeigh, 'Huge Rise in US Plastic Waste Shipments to Poor Countries Following China Ban' (*The Guardian*, 5 October 2018) <www.theguardian.com/global-development/2018/oct/05/huge-rise-us-plastic-waste-shipments-to-poor-countries-china-ban-thailand-malaysia-vietnam>.

3 Eg Ellen MacArthur Foundation, 'One Garbage Truck of Textiles Wasted Every Second: Report Creates Vision for Change' (*Ellen MacArthur Foundation*, 28 November 2017) <www.ellenmacarthurfoundation.org/news/one-garbage-truck-of-textiles-wasted-every-second-report-creates-vision-for-change>; Patsy Perry, 'The Environmental Costs of Fast Fashion' (*The Conversation*, 27 December 2017) <https://theconversation.com/read-this-before-you-go-sales-shopping-the-environmental-costs-of-fast-fashion-88373>.

4 Jemma R Jambeck and others, 'Plastic Waste Inputs from Land into the Ocean' (2015) 347(6223) Science 768, 770.

5 Lisbeth Van Cauwenberghe and Colin R Janssen, 'Microplastics in Bivalves Cultured for Human Consumption' (2014) 193 Environmental Pollution 65; P Schwabl and others, 'Assessment of Microplastic Concentrations in Human Stool – Preliminary Results of a Prospective Study' (UEG Week 2018, Vienna, 24 October, 2018).

6 UNEP, *Valuing Plastics: The Business Case for Measuring, Managing and Disclosing Plastic Use in Consumer Goods Industry* (UNEP 2014) 12.

7 A McIlgorm, HF Campbell and MJ Rule, 'Understanding the Economic Benefits and Costs of Controlling Marine Debris in the APEC Region (MRC 02/2007)' (2007) Report to the Asia-Pacific Economic Cooperation Marine Resource Conservation Working Group by the National Marine Science Centre (University of New England and Southern Cross University), 11-12 <www.nowpap.org/data/ML%20ref/APEC%27ML-control...Cost-vs-Benefit.pdf>.

8 European Commission, 'Our Oceans, Seas and Coasts – Descriptor 10: Marine Litter' (*European Commission*, 2018) <http://ec.europa.eu/environment/marine/good-environmental-status/descriptor-10/index_en.htm>.

9 Eg World Economic Forum, Ellen MacArthur Foundation and McKinsey & Company, *The New Plastics Economy – Rethinking the Future of Plastics* (Ellen MacArthur Foundation 2016); Sofie Huysman and others, 'Performance Indicators for a Circular Economy: A Case Study on Post-industrial Plastic Waste' (2017) 120 Resources, Conservation and Recycling 46; Patrick ten Brink and others, 'Circular Economy Measures to Keep Plastics and their Value in the Economy, Avoid Waste and Reduce Marine Litter' (2018) Economics Discussions Papers No 2018-3, Kiel Institute for the World Economy <www.economics-ejournal.org/economics/discussionpapers/2018-3>.

prosperity, environmental protection, and social equity.[10] Critically, plastic waste would be conceived as a resource to be reused, recycled or recovered. McKinsey estimates that the global value of resource efficiency gains could eventually reach benefits of US$3.7 trillion per year.[11] Moreover, circularity design principles can stabilise a delicate international resource and waste management system, avoiding future scenarios repeating the recent, widespread international repercussions caused by the introduction of a Chinese ban on the import of certain wastes – for example, Indonesia, Vietnam, and Taiwan have introduced heavy restrictions as a result of the increased amounts of plastic wastes being imported.[12]

Laws and policies at different government levels are supporting transitions towards circular economy approaches. Examples include the European Union's (EU) 2015 Circular Economy Action Plan[13], as part of which the Strategy for Plastics in the Circular Economy[14] was adopted in 2018. This includes a proposal for a directive on the reduction of the impact of certain plastic products on the environment.[15] National examples include China's Circular Economy Promotion Law 2008,[16] Germany's Closed Substance Cycle and Waste Management Act of 1996,[17] and Japan's 2000 Fundamental Law for Establishing a Sound Material-cycle Society.[18] Laws and policies have also had a role to play in local manifestations of circular economies (called 'industrial symbiosis' or 'eco-industrial parks') in, for example, Denmark, the Netherlands, Sweden, and the UK.[19] Beyond the top-down approach, there are private and voluntary stakeholders driving implementation of circular approaches: the British Plastics Federation has published *Plastics: A Vision for a Circular Economy*'.[20] PlasticsEurope, a pan-European association of plastic manufacturers in Europe, is examining the circular economy as a sustainable model for plastics;[21] and the Ellen MacArthur Foundation is leading the New Plastics Economy initiative to bring together key stakeholders to rethink and redesign the future of plastics.[22] These are all, however, relatively isolated stories of success[23] and the actual implementation of circular approaches remains 'limited and fragile'.[24] More research is therefore needed on the law and policy instruments that can enable circular economies for resources and waste, including plastics.[25]

10 Julian Kirchherr, Denise Reike and Marko Hekkert, 'Conceptualizing the Circular Economy: An Analysis of 114 Definitions' (2017) 127 Resources, Conservation & Recycling 221, 224-225.

11 Richard Dobbs and others, *Resource Revolution: Meeting the World's Energy, Materials, Food, and Water Needs* (McKinsey Global Institute and McKinsey Sustainability & Resource Productivity Practice 2011) 10.

12 Roger Harrabin and Tom Edgington, 'Recycling: Where is the Plastic Waste Mountain?' *BBC* (1 January 2019) <www.bbc.co.uk/news/science-environment-46566795>.

13 Commission, 'Closing the Loop – An EU Action Plan for the Circular Economy' (Communication) COM(2015) 614 final.

14 Commission, 'A European Strategy for Plastics in a Circular Economy' (Communication) COM(2018) 28 final.

15 Commission, 'Proposal for a Directive of the European Parliament and of the Council on the Reduction of the Impact of Certain Plastic Products on the Environment' (Communication) COM(2018) 340 final 2.

16 Circular Economy Promotion Law of the People's Republic of China (promulgated by The Standing Committee of the National People's Congress, August 29, 2008), effective January 1, 2009.

17 Act for Promoting Closed Substance Cycle Waste Management and Ensuing Environmentally Compatible Waste Disposal (Gesetz zur Förderung der Kreislaufwirtschaft und Sicherung der umweltverträglichen Beseitigung von Abfällen) v. 27.9.1994, BGBI.I 1994, p. 2705.

18 The Basic Act for Establishing a Sound Material-Cycle Society, Act No.110 of 2 June 2000.

19 Katrien Steenmans, 'Enabling Industrial Symbiosis Through Regulations, Policies, and Property Rights' (PhD thesis, University of Surrey 2018) 256-265.

20 British Plastics Federation, *Plastics: A Vision for a Circular Economy: Improving the Environment for the Next Generation* (British Plastics Federation 2018).

21 PlasticsEurope, 'Plastics' Contribution to the Circular Economy' (*PlasticsEurope,* 2018) <www.plasticseurope.org/en/focus-areas/circular-economy>.

22 New Plastics Economy, 'New Plastics Economy' (2018) <https://newplasticseconomy.org>.

23 John A Mathews and Hao Tan, 'Circular Economy: Lessons from China' (2016) 531 Nature 440, 441.

24 Nicky Gregson and others, 'Interrogating the Circular Economy: The Moral Economy of Resource Recovery in the EU' (2015) 44(2) Economy and Society 218, 218.

25 Steenmans (n 19) 292-293. See also: Katrien Steenmans, Rosalind Malcolm and Jane Marriott, 'Commodification of Waste: Legal and Theoretical Approaches to Industrial Symbiosis as Part of a Circular Economy' (2017) University of Oslo Faculty of Law Legal Studies Research Paper 2017-26.

Extended Producer Responsibility (EPR) is a legal tool that has been identified as one of the key opportunities 'for further development of regulatory and policy instruments to enable' circular economy approaches,[26] and therefore also a potentially valuable tool for incentivising more effective plastic waste management. In essence, EPR is where the producer of a product retains responsibility of some form for the product throughout its life cycle, including when it becomes waste. There has been a substantial increase in implementation and interest in EPR schemes over the last decade, as well as a growth in academic literature on the economics of EPR,[27] with Sachs describing it in 2006 as 'one of the most significant developments in global environmental policy in the last decade'.[28]

The concept of EPR has been incorporated at EU level.[29] The focus of this article is on its inclusion in the 2008 Waste Framework Directive (WFD),[30] the cornerstone of EU waste law. The EU implementation of EPR has, however, been criticised in the literature and is therefore considered to have limited impact.[31] These limitations need to be addressed in order to increase EPR's effectiveness. Directive 2018/851[32] amended the 2008 WFD with its aim in part to clarify the EPR provisions.[33] This article assesses these amendments to EPR by investigating the particular question: To what extent do the Directive 2018/851 amendments to the 2008 WFD EPR scheme address criticisms of EPR for the purpose of facilitating transitions towards circular economies? This question is explored by adopting a doctrinal approach and drawing on examples in the context of plastic waste.

For the purpose of the overarching research question, the remainder of the article is structured as follows. The next section, Section 2, examines the concept of EPR in more detail, including its anticipated benefits and alignment with the circular economy. The subsequent section, Section 3, then evaluates EPR within the 2008 WFD. Section 4 sets out the recent amendments to the EPR scheme introduced by Directive 2018/851 including how these address some of the criticisms, and discusses some of the developments on the horizon that may affect the scope and effectiveness of EPR schemes, particularly within the plastic waste context. The final section concludes.

2 UNDERSTANDING EXTENDED PRODUCER RESPONSIBILITY

In this section, the concept of EPR is detailed by describing the different forms in which it can exist, together with its general advantages and limitations. This understanding is then used in subsequent sections to understand the particular EU implementation of the concept, and identify potential gaps and opportunities.

The concept of EPR, where responsibilities for waste management are shifted from consumers and authorities (those traditionally made responsible) to the producer of a product, has been around for a

26 Steenmans (n 19) 290. See also: Organisation for Economic Co-operation and Development, 'Working Party on Resource Productivity and Waste' (OECD 2015); ten Brink and others (n 9) 6 and 9; Nathan Kunz, Kieren Mayers and Luk N Van Wassenhove, 'Stakeholder Views on Extended Producer Responsibility and the Circular Economy' (2018) 60(3) California Management Review 45, 46; Zhe Liu, Michelle Adams and Tony R Walker, 'Are Exports of Recyclables from Developed to Developing Countries Waste Pollution Transfer or Part of the Global Circular Economy' (2018) 136 Resources, Conservation & Recycling 22, 23.

27 Garth T Hickle, 'An Examination of Governance within Extended Producer Responsibility Policy Regimes in North America' (2014) 92 Resources, Conservation and Recycling 55, 56; Daniel Kaffine and Patrick O'Reilly, 'What Have We Learned about Extended Producer Responsibility in the Past Decade? A Survey of the Recent EPR Economic Literature' (ENV/EPOC/WPRPW(2013)final, OECD, 21 January 2015) 4; Sergio Rubio and others, 'Effectiveness of Extended Producer Responsibility Policies Implementation: The Case of Portuguese and Spanish Packaging Waste Systems' (2019) 210 Journal of Cleaner Production 217, 218.

28 Noah Sachs, 'Planning the Funeral at the Birth: Extended Producer Responsibility in the European Union and the United States' (2006) 30 Harvard Environmental Law Review 51, 54.

29 See Section 2.

30 Directive 2008/98/EC of 19 June November 2008 on waste and repealing certain Directives [2008] OJ L312/3 (2008 WFD).

31 See Section 3.

32 Directive 2018/851 of 30 May 2018 amending Directive 2008/98/EC on waste [2018] OJ L 150/109.

33 Directive 2018/851, recital 9. See also Section 4.

number of decades. Xerox, a company offering products including photocopiers, has, for example, been 'taking back' its products since the 1960s, though this was not formalised, for environmental purposes until their Asset Recycle Management Program introduced in 1991.[34] In contrast, it was not until a few decades later that EPR was explicitly recognised at national level. EPR was formulated and developed by Lindhqvist in a 1990 report to the Swedish Ministry of the Environment,[35] and in the same year the German Minister of the Environment, Hans Töpfer, proposed an EPR approach for the Ordinance on the Avoidance of Packaging Waste (*Verpackungsverordnung*).[36] This Ordinance became effective in 1991 and was the first practical application of EPR in the EU (called the German Green Dot scheme).[37] Within a decade, EPR approaches were seen more widely and were incorporated at EU level, first in 2000 in the End-of-Life Vehicles Directive[38] and subsequently in the Waste Electrical and Electronic Equipment Directive[39] and 2008 WFD.

The types of responsibilities that can be assigned under EPR schemes, and the benefits and challenges of the concept are examined in the next sections. These types will be used to examine EPR to facilitate an analysis of the EU implementation of the concept in Sections 3 and 4.

2.1 Types of Extended Producer Responsibility

Lindhqvist distinguished between four types of producer responsibility.[40] These categorisations are useful because they provide a foundational understanding of EPR schemes and the incentives provided by them. The categories are:[41]

- *Physical responsibility* is where the producer is involved in physical end-of-life management of the products and/or their effects through development of technology or provision of services. For example, Xerox physically took products back as part of their Asset Recycle Management Program. The intended advantages included providing 'the necessary leadership, strategy, design principles, operational and technical support to maximize global recycling … resulting in a major competitive, as well as environmental advantage for Xerox'.[42]

- *Economic responsibility* is where a producer covers all or part of the costs (directly or by a special fee) for managing the wastes at the product's end-of-life, for example, for the collection, processing, and disposal. In the Netherlands, for example, the Packaging

34 JA Scott and others, 'Concepts and Methodologies to Help Promote Industrial Ecology' in Christian N Madu (ed), *Handbook of Environmentally Conscious Manufacturing* (Springer Science+Business Media 2000) 40; Wendy Kerr and Chris Ryan, 'Eco-efficiency Gains from Remanufacturing: A Case Study of Photocopier Remanufacturing at Fuji Xerox Australia' (2001) 9 Journal of Cleaner Production 75, 77.

35 Thomas Lindhqvist and Karl Lidgren, 'Modeller för Förlängt Producentansvar' in Ministry of the Environment (ed), *Fran Vaggan til Graven – Sex Studier av Varors Miljöpåverken* (Allmänna förl 1990); Thomas Lindhqvist, 'Extended Producer Responsibility in Cleaner Production: Policy Principle to Promote Environmental Improvements of Product Systems' (PhD thesis, Lund University 2000) ii.

36 Ordinance on the Avoidance of Packaging Waste (Verpackungsverordnung – VerpackV) v.20.6.1991, BGBI.I 1991, p. 1234. Note that this version is no longer in force.

37 For more information, see eg: Eric Neumayer, 'German Packaging Waste Management: A Successful Voluntary Agreement with Less Successful Environmental Effects' (2000) 10 European Environment 152; Per Olof Busch and Helge Jörgens, 'Breaking the Deadlock – Voluntary Agreements and Regulatory Measures in German Waste Management' (ECPR, Grenoble, 2001) <https://ecpr.eu/Filestore/PaperProposal/13ccd0de-228d-413f-8656-7d61f4fc1f2f.pdf >; Sachs (n 28) 68.

38 Directive 2000/53/ECL of 18 September 2000 on end-of-life vehicles [2000] OJ L269/34. The phrase 'extended producer responsibility' is not used. Instead, the concept is embodied by the responsibilities assigned in the Directive of collecting (art 5), treating (art 6), and reusing and recovering (art 7).

39 Council Directive 2012/19/EU of 4 July 2012 on waste electrical and electronic equipment [2012] OJ L197/38 (WEEE Directive). Similarly to the End of Vehicles Directive, this makes no reference to 'extended producer responsibility' but refer to treatment (art 6) and recovery (art 7).

40 Lindhqvist (n 35) 38-39.

41 ibid.

42 Scott and others (n 34) 40.

Decision 2014 states that the producer is responsible for the costs of separate collection or collection and subsequent separation of packaging (including plastics).[43]

- *Liability* is where responsibility for environmental damages caused by a product is borne by its producer. This may encompass damages occurring at various stages in the life cycle including use and final disposal.

- *Informative responsibility* is where the producer is required to provide information on the product and its environmental effects in various life cycle stages, such as on the polluting effects of waste produced by the product.

The EPR types are not necessarily distinct and can overlap and be simultaneously present, as illustrated in Figure 1. The Dutch Packing Decision 2014, for example, also requires informative responsibility (there are reporting obligations if a producer places and removes more than 50,000 kg of packaging waste annually)[44] and physical responsibility (the producer is responsible for separate intake or collection and separation of packaging)[45] in addition to the economic responsibility highlighted above. When all other EPR types are present, then Lindhqvist states there is ownership,[46] though this has been re-labelled as 'property rights' in Figure 1 to indicate that other property rights may be relevant under other responsibility schemes. A discussion of the property rights in relation to the different types of responsibility is beyond the scope of this article, but it is recommended as a potential useful tool to increase the effectiveness of EPR schemes as property rights in waste can affect treatment of waste.[47]

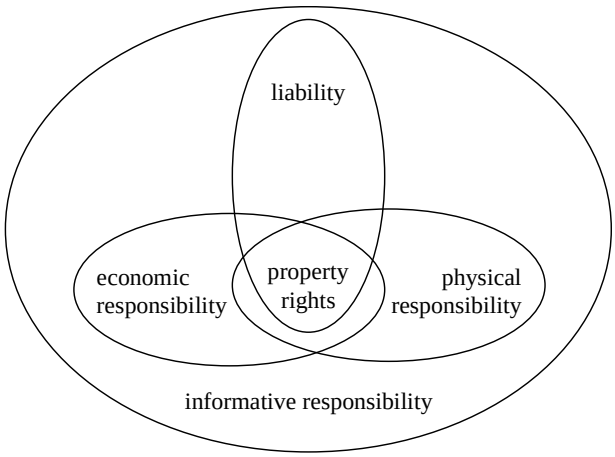

Figure 1. Types of EPR. Adapted from Lindhqvist (2000).[48]

2.2 Advantages and Limitations

There are a number of general advantages and limitations of EPR schemes, which are set out below to understand the general concept of EPR. These are referred to in subsequent sections to examine whether the particular EU implementation of the concept has underpinned or detracted from these advantages, and addressed or disregarded the disadvantages.

First, EPR is a manifestation of the polluter-pays principle, which is that the person who caused the pollution should pay the costs of it and where waste is conceived as pollution.[49] EPR therefore supports a key principle of EU environmental law[50] by operationalising it within a mechanism, while simultaneously the principle provides a legal policy basis in the EU context for EPR. Economic responsibility is a clear 'logical extension' of the

43 Besluit beheer verpakkingen van 2014 [Dutch Packaging Decision 2014], art 5(2).
44 Dutch Packaging Decision 2014, art 8.
45 Dutch Packaging Decision 2014, art 5(1).
46 Lindhqvist (n 35) 38-39.
47 See eg Steenmans, Malcolm and Marriott (n 25).
48 Thomas Lindhqvist, 'Extended Producer Responsibility in Cleaner Production: Policy Principle to Promote Environmental Improvements of Product Systems' (PhD thesis, Lund University 2000) 38.
49 For a discussion on whether waste is pollution or not, please see: Steenmans (n 19) 6-8.
50 Treaty on the Functioning of the European Union [2012] OJ C326/49, art 191(2).

polluter-pays principle,[51] as the producer of the product has to pay for waste management of product. The other types of responsibility can similarly have cost implications for the producers; financing is required to collect and produce information, and organise physical responsibility of waste. Some industry stakeholders' groups have argued that EPR

> distorts the Polluter Pays Principle because it is consumers, not producers, that are the 'polluters' in the context of product externalities. Consumers actually introduce products into the environment by discarding them, whereas producers are making a useful product, not a waste. In this view, product externalities such as waste disposal cost or environmental impacts of disposal are caused by the consumer's decision to consume, not the producer's decision to produce.[52]

Therefore, the preventive principle, which sets out to prevent the creation of pollution or nuisance at source,[53] may provide a more appropriate basis for EPR as the producer is the original 'creator' of the product that may lead to pollution. Principles of industrial ecology – a field focused on cycling resources like natural ecosystems[54] – can, however, be applied to explain why producers can still be considered the polluters: 'environmental externalities have their origin in the design decisions for the products produced in the factor, and indeed, in the decision to produce a certain product in the first place'.[55] Additional arguments to explain the producers as the polluters can also highlight the role of producers in creating or increasing a demand and desire amongst consumers to consume that product, which then leads to pollution.

Furthermore, the concept of EPR resonates metaphorically with the concept of the circular economy, as both seek to move from linear and unidirectional to cyclical and closed loops,[56] so it can result in similar benefits described by Kirchherr and others.[57] Liu and others have even described EPR as one of the legal mechanisms needed to help reshape and rebalance circular economy approaches.[58] Although some argue that the general concept of EPR deviates from circular approaches, as EPR is largely focused on improving the recycling of materials rather than the reuse and repair, which are prioritised by circular economy approaches.[59]

Another advantage of EPR is the shifting of physical and economic responsibilities, which can incentivise producers, instead of local authorities, to innovate, access specialised expertise regarding the product design and technology development, and incorporate 'green' design and effective waste management schemes into their overall production strategies.[60] EPR is therefore a market-based scheme, as producers internalise the costs of externalities.[61] This has resulted in some scholars describing EPR as a 'next generation' environmental policy that relies on market incentives instead of traditional command-and-control mandates.[62] As this advantage illustrates, the shifting of physical and financial responsibilities are usually

51 KH Forslind, 'Implementing Extended Producer Responsibility: The Case of Sweden's Car Scrapping Scheme' (2005) 13 Journal of Cleaner Production 619, 620. See also eg: Scott and others (n 34) 40; Nicole C Kibert, 'Extended Producer Responsibility: A Tool for Achieving Sustainable Development' (2004) 19(2) Journal of Land Use 503, 504.

52 Sachs (n 28) 65.

53 Included in the WFD in Article 4(1) through prioritising the prevention of waste in the waste hierarchy.

54 Eg Robert A Frosch and Nicholas E Gallopoulos, 'Strategies for Manufacturing' (1989) 189 Scientific American 152, 152.

55 Sachs (n 28) 66.

56 Reid Lifset, Atalay Atasu and Naoko Tojo, 'Extended Producer Responsibility: National, International and Practical Perspective' (2013) 17(2) Journal of Industrial Ecology 162, 162.

57 See text to n 10.

58 Liu and others (n 26) 23.

59 Kunz and others (n 26) 46; Organisation for Economic Co-operation and Development, 'Working Party on Resource Productivity and Waste' (OECD 2015).

60 Maria Lee, 'New Generation Regulation? The Case of End-of-Life Vehicle' (2002) 11(4) European Environmental Law Review 114, 116; Alice Castell, Roland Clift and Chris France, 'Extended Producer Responsibility in the European Union: A Horse or a Camel?'(2004) 8(1-2) Journal of Industrial Ecology 4, 4.

61 Eg OECD, *Instrument Mixes for Environmental Policy* (OECD Publishing 2007) 158.

62 Eg Neil Gunningham and Darren Sinclair, *Leaders and Laggards: Next Generation Environmental Regulation* (Greenleaf Publishing 2002) 198; Sachs (n 28) 53.

highlighted as providing the core rationale for implementing EPR schemes.[63] The emphasis on these types of EPR is mirrored in practice; across an examination of four case studies in Denmark, Netherlands, Sweden, and the UK, where EPR was found to be predominantly present in the form of economic responsibility, and sometimes physical or informative responsibility.[64] This limits the potential overall impact of EPR schemes as it under-utilises the benefits offered by the other types of responsibility.

The final advantage of EPR schemes discussed in this section is the underlying motivation to achieve economic, environmental and social benefits.[65] Evidence exists that EPR schemes have resulted in significant economic and environment benefits both in and outside the EU. For example, it is estimated that the EPR programmes for electronics, mercury thermostats, paint, and mattresses in the US state of Connecticut resulted in: (1) the diversion of more than 26 million pounds of materials from waste; (2) cumulative cost savings of more than US$2.6 per annum to Connecticut municipalities; (3) services worth another US$6.7 million that created more than 100 jobs; and (4) reduced greenhouse gas emissions by more than 13 million kg of carbon dioxide equivalent.[66] In Germany, the Packaging Ordinance between 1992 and 1993 reduced the volume of packaging by 1 million tonnes and saved the cost of waste not gone to final disposal by an estimated US$2.1 billion.[67]

Simultaneously, there are not always economic advantages to EPR schemes; EPR schemes are likely to be implemented with increased costs to industry and society.[68] It can be particularly expensive to set up an EPR system for an individual producer. In order to reduce costs, some companies can organise themselves collectively and create a producer responsibility organisation. The primary task of such an organisation is to set up and manage the infrastructures needed to collect and process waste on behalf of their individual members. But, the formation and operation of producer responsibility organisations 'has garnered scrutiny from competition authorities and often necessitated a legislative response … to facilitate their functioning through exemption from state competitive conduct laws'.[69] Additionally, environmental benefits may not always be reaped. Some EPR schemes that include weight-based fee structures have led to a focus on light-weighting, or, for example, the Dutch Packaging System only applies informative responsibility if a weight threshold is met.[70] Such schemes risk rewarding lighter, and not necessarily more recyclable, materials.[71]

Finally, Stahel argues that overall the concept of 'responsibility' itself is too weak (though this arguably depends on the type of responsibility and could be as a result of a labelling issue of liability v responsibility);[72] he observes that only relatively few producers have changed their industrial design priorities or installed buy-back strategies to components or molecules for reuse as a result of EPR.[73] Watkins and others support this view of EPR,

63 Harri Kalimo and others, 'Greening the Economy through Design Incentives: Allocating Extended Producer Responsibility' (2012) 21(6) EELR 274, 274.

64 Steenmans (n 19) 262.

65 Atalay Atasu, 'Operational Perspectives on Extended Producer Responsibility' (forthcoming) Journal of Industrial Ecology 1, 1.

66 Connecticut – Product Stewardship Institute, *Connecticut Extended Producer Responsibility Program Evaluation: Summary and Recommendations* (Product Stewardship Institute 2017). Note that these figures are estimates as data on recovery rates and recycling/disposal costs were limited.

67 Environment Policy Committee, *Extended Producer Responsibility Phase 2: Case Study on the German Packaging Ordinance* (Working Paper ENV/EPOC.PPC(97)21/REV2, Organisation for Economic Co-operation and Development, May 1998) 24. Based on a conversion rate of US$1 = 1 Deutsche Mark – the exchange rate in 1993 according to: Harold Marcuse, 'Historical Dollar-to-Marks Currency Conversion Page' (7 October 2018) <www.history.ucsb.edu/faculty/marcuse/projects/currency.htm>.

68 Kieren Mayers and Scott Butler, 'Producer Responsibility Organisations Development and Organisations: A Case Study' (2013) 17(2) Journal of Industrial Ecology, 287.

69 Hickle (n 27) 56-57.

70 See text to n 44.

71 Emma Watkins and others, *EPR in the EU Plastics Strategy and Circular Economy: A Focus on Plastic Packaging* (Institute for European Environmental Policy 2017) 2.

72 Labeling theory addresses the effects and influence of labels on individuals their behaviour. See eg: Erving Goffman, *Stigma: Notes on the Management of Spoiled Identity* (Prentice Hall 1963); Howard Becker, *Outsiders* (Free Press 1973); Michael Petrunik, 'The Rise and Fall of "Labelling Theory": The Construction and Destruction of a Sociological Strawman' (1980) 5(2) The Canadian Journal of Sociology 2013.

73 Walter Stahel, *Circular Economy for Beginners* (Ellen MacArthur Foundation forthcoming) 32.

as they find that EPR measures have so far largely failed to incentivise packaging producers towards eco-design.[74] Instead a concept like 'producer liability' would be much more effective as it goes far beyond EPR.[75] The discussion of the respective benefits and limitations of responsibility compared to liability are beyond the scope of this article. In recognition of its weaker nature, EPR should not be adopted as a standalone measure.

As a result of some of its disadvantages and limitations, EPR is more likely to be useful and effective as part of an integrated regulatory approach, where there is a mix of law and policy instruments, including economic instruments and complementary policies to promote innovation.[76] In particular, an economic study by Arnaud demonstrated that EPR could be an optimal policy if combined with bonus and penalty systems.[77] At the same time, combining EPR with such instruments should be carefully evaluated before adoption, as 'we should keep in mind that regulations that are too intrusive would contradict the essence of EPR which is delegation'.[78] Thus, EPR schemes need to achieve the tricky balance of retaining the flexible nature of EPR schemes, while introducing sufficient complementary laws and policies to ensure such schemes are effective. Such an assessment of the EPR concept within the WFD is beyond the scope of this paper, as this paper focuses solely on EPR rather than the other mechanisms set out in the WFD that have to or may be adopted alongside it.

74 Watkins and others (n 71) 2.

75 Stahel (n 73) 30.

76 Annika Gottberg and others, 'Producer Responsibility, Waste Minimisation and the WEEE Directive: Case Studies in Eco-design from the European Lighting Sector' (2006) 359 Science of the Total 38, 49; Brice Arnaud, 'Extended Producer Responsibility and Green Marketing: An Application to Packaging' (2017) 67(2) Environmental and Resource Economics 285; Jooyoung Park, Nohora Díaz-Posada and Santiago Mejía-Dugand, 'Challenges in Implementing the Extended Producer Responsibility in an Emerging Economy: The End-of-Life Tire Management in Colombia' (2018) 189 Journal of Cleaner Production 754, 754; Steenmans (n 19) 254.

77 Brice Arnaud, 'Extended Producer Responsibility and Green Marketing: An Application to Packaging' (2017) 67(2) Environmental and Resource Economics 285.

78 Pierre Fleckinger and Matthieu Glachant, 'The Organization of Extended Producer Responsibility in Waste Policy with Product Differentiation' (2010) 59 Journal of Environmental Economics and Management 57, 66.

3 EPR IN THE WFD BEFORE 2018 AMENDMENTS

In this section the EPR scheme as included in the original version of the 2008 WFD is examined by investigating the following three questions within the context of the waste crises set out in Section 1 and the possible forms, advantages, and limitations of the concept of EPR set out in Section 2: (1) what is EPR under the original 2008 WFD; (2) who is responsible for what under EPR measures; and (3) when does a producer's EPR end, that is: when is a producer no longer responsible under EPR? These questions are both critical for understanding the EU's implementation as well as its limitations.

3.1 What is EPR in the 2008 WFD?

EPR was defined in neither the original 2008 WFD nor its accompanying guidance document.[79] It was described in Recital 27 of the WFD as

> one of the means to support the design and production of goods which take into full account and facilitate the efficient use of resources during their whole life cycle including their repair, re-use, disassembly and recycling without compromising the free circulation of goods on the internal market.[80]

By introducing it as 'one of the means' the WFD highlights that it is one part of a wider mix of law and policy instruments likely to be required (as mentioned in the final paragraph of the previous section). Furthermore, the description in Recital 27 reflects the rationale of EPR schemes generally as discussed in Section 2, and also keeps the concept very open by not

79 European Commission, *Guidance on the Interpretation of Key Provisions of Directive 2008/98/EC on Waste* (June 2012) 28.

80 2008 WFD, recital 27.

aligning with or limiting itself to a specific EPR type (as set out in Section 2.1). Instead, Member States may according to Article 8(1) of the 2008 WFD take 'legislative or non-legislative measures to ensure that any natural or legal person who professionally develops, manufacturers, processes, treats, sells or imports products (producer of the product)' has EPR. The requirement for other measures demonstrates that EPR is not introduced as a regulatory instrument in itself and should instead applied through, for example, economic, legal, and voluntary instruments.[81] Instead, Kroepelien argues that it 'seems to establish itself between an instrument and a goal as some kind of principle or concept',[82] while Forslind refers to it as an environmental strategy.[83] Article 8(1) continues to provide some examples of what such measures may include:

> an acceptance of returned products and of the waste that remains after those products have been used, as well as the subsequent management of the waste and financial responsibility for such activities. These measures may include the obligation to provide publicly available information as to the extent to which the product is re-usable and recyclable.

These examples focus specifically on physical, economic and informative responsibilities in contrast to Recital 27, but as these are non-exhaustive the other EPR types are not excluded.

EPR has therefore been left open to interpretation. Such openness can offer flexibility, which in turn can lead to innovation.[84] This is one of the desired outcomes of EPR as identified in Section 2.2: for producers to innovate and design their products with a 'cradle to cradle' approach to product life cycles.[85] For this reason, EPR schemes are often implemented through dynamic laws and policies schemes to allow producers to respond to changes in market, production and processing technologies.[86] At the same time, the lack of a common approach has led to differing implementation and, more importantly, performances across the EU.[87] The current EU legal architecture can thus promote a plurality of EPR ideas. For example, one way in which the approaches differ is that prevention of waste is not necessarily and consistently prioritised by those implementing EPR schemes.[88] This is then an internal contradiction of the concept, as the preventive principle arguably provides a legal basis for the concept of EPR (see Section 2.2). Article 8(2) of the 2008 WFD does state that EPR measures may be taken 'in order to ensure that the recovery and disposal of products that have become waste take place in accordance with Articles 4 and 13',[89] where Article 4 sets out the waste hierarchy which prioritises prevention as the preferred option for waste management. Article 4(2) of the 2008 WFD permits deviation from the hierarchy where this is justified, thereby altogether allowing different approaches, but overall prevention should still be encouraged.

3.2 Who is Responsible for What Under EPR?

Under WFD EPR schemes, responsibility is assigned to product producers. Product producers are defined widely as 'any natural or legal person who professionally develops, manufactures, processes,

81 Eg Knut F Kroepelien, 'Extended Producer Responsibility – New Legal Structures for Improved Ecological Self-organization in Europe?' (2000) 9(2) RECIEL165, 166; Lee (n 60) 116; Chris van Rossem, Naoko Tojo and Thomas Lindhqvist, *Extended Producer Responsibility: An Examination of its Impact on Innovation and Greening Products* (Greenpeace International 2006).

82 Kroepelien (n 81) 166.

83 Forslind (n 51) 620.

84 Jacques Pelkmans and Andrea Renda, 'Does EU Regulation Hinder or Stimulate Innovation' (2014) CEPS Special Report No. 96/November 2014, 8 <www.ceps.eu/system/files/No%2096%20EU%20Legislation%20and%20Innovation.pdf>.

85 Kunz and others (n 26) 46.

86 Roland Clift, 'The ECTEL Trials' (1997) 1(2) Journal of Industrial Ecology 3, 4; Reid Lifset and Thomas Lindhqvist, 'Trust, but Verify' (2002) 5(2) Journal of Industrial Ecology 9, 9; Reid Lifset and Thomas Lindhqvist, 'Producer Responsibility at a Turning Point?' (2008) 12(3) Journal of Industrial Ecology 144, 144..

87 Watkins and others (n 71) 2.

88 Mark Dempsey and others, *Individual Producer Responsibility: A Review of Practical Approaches to Implementing Individual Producer Responsibility for the WEEE Directive* (Working Paper, INSEAD Collection 2010/71/TOM/ISC, INSEAD 2010) 11; Lifset and others, (n 56) 162 and 165.

89 2008 WFD, art 8(2).

treats, sells or imports products'.[90] Regardless of the relevant form of EPR as set out in Section 2.1, this definition and the literature raises three critical questions in identifying product producers: (1) how is EPR distributed when a number of different actors are involved in the production of a product (as often there will not be just one legal entity that develops, manufacturers, processes, treats, sells or imports products, but instead this will often be different actors across a supply chain, in part as a result of a product being the result of different constituent components); (2) what happens to the EPR of products of which the producers have gone out of business;[91] and (3) who will pay for historical waste, that is those items that are already in use and were not designed for EPR?[92]

In relation to the first question, the Commission requires there to be a clear allocation of responsibilities between the different actors covered by the definition at national level.[93] In addition, some of these actor types may comprise several stakeholders. For example, many products are the result of a product-chain involving a number of different actors (which is also a key feature of the circular economy). A very simplified example is a product containing microbeads, which are manufactured solid plastic particles of less than one millimetre, in a plastic container. Is the producer of the container or the microbeads or the product containing the microbeads responsible? Again, there would need to be a clear agreement defining the responsibility of each producer, or at least clearly stating which producer has subsumed all the responsibility for the final product.

The second and third questions can be addressed together through similar mechanisms; in essence, the waste of out-of-business producers could be treated as historical waste. One of the main approaches proposed to overcome the problem of historical waste in relation to the Waste Electrical and Electronic Equipment Directive is a 'visible fee', which is an additional and identified cost charged to the customer. It would be a defined standard fee that is applied across a product category.[94] But a number of shortcomings of these approaches have been identified in practice, including that visible fees do not provide an incentive for improvement in manufacturing products, and in France where visible fees are mandatory it is uncertain whether it has had any actual effect on the purchasing patterns of consumers.[95] Within the context of the WEEE Directive, it is also arguable whether it clearly aligns, as the WEEE Directive states that the financing in respect of WEEE from private households and other users for the collection, treatment, recovery, and environmentally sound disposal of WEE should be provided by producers.[96] Visible fees could therefore potentially apply to the concept of EPR more generally within the WFD, but still requires further investigation and clarification.

3.3 When is a Producer No Longer Responsible Under EPR?

Following on from the previous question regarding to whom EPR is assigned, the next question is: when does it end? This is a particularly poignant question in the case of littering, which is one of the key issues in relation to plastic waste as highlighted in the introductory section to this article. If a person has littered plastic waste, then they are the 'true' polluters and have committed an unlawful act, as abandonment of waste is not permitted under Article 36 of the 2008 WFD, but this would not necessarily preclude EPR from applying. If an exception is made in the case of littering, how can it be ensured that such a provision is not abused? Similar to the previous questions explored in the preceding sub-sections, clarification is required to mitigate these issues.

90 2008 WFD, art 8(1).

91 Lifset and Lindhqvist, 'Producer Responsibility at a Turning Point? (n 86) 144.

92 Roland Clift and Chris France, 'Extended Producer Responsibility in the EU: A Visible March of Folly' (2006) 10(4) Journal of Industrial Ecology 5, 5.

93 European Commission, *Development of Guidance on Extended Producer Responsibility (EPR)* (European Commission 2014) 122.

94 Eg NIRAS, 'The Danish Voluntary Agreement on WEEE' (February 2015) 10 and 12 <http://di.dk/SiteCollectionDocuments/Miljø/Nyheder/Sarahs%20mappe%20-%20nyheder/WEEE/Differentiated%20Payment%20EN%20report.%20docx.pdf>.

95 Clift and France (n 92) 5; NIRAS (n 94) 9.

96 WEEE Directive, arts 12 and 13. A full analysis of this potential contradiction is beyond the scope of this paper as the focus is on EPR within the WFD.

4 MOVING FORWARD

The previous sections have discussed the potential benefits of EPR as well as the issues with its current implementation at the EU level. This section now sets out whether and to what extent amendments by Directive 2018/851 to the 2008 WFD have addressed the identified issues in Section 3: (1) is there a more narrow understanding implemented of EPR to ensure more consistent performance of EPR schemes (see Section 3.1); (2) who is responsible for what under EPR measures when multiple stakeholders are involved and in relation to historical waste (see Section 3.2); and (2) are there instances where the actions of a user of a product 'invalidate' a producer's EPR (Section 3.3). The amendments have only recently come into force, so this section is limited to hypothesising about the anticipated impacts. This section concludes by looking at a proposed directive that will have an impact on EPR schemes specially in relation to plastic waste.

4.1 2018 Amendments to EPR in the WFD

When considering amendments to EPR within the context of the WFD as amended by Directive 2018/851, the most notable changes are the inclusion of a definition of EPR and the introduction of general minimum requirements for EPR schemes, which are discussed in the following sections, as well as other changes.[97]

4.1.1 Definition of EPR

A definition of EPR has been included as Article 3(21) of the WFD in order to clarify the scopes of the concept:[98]

> 'extended producer responsibility scheme' means a set of measures taken by Member States to ensure that producers of products bear financial responsibility or financial and organisational responsibility for the management of the waste stage of a product's life cycle.

The interpretation of 'producers of products' remains unchanged.[99] This amendment limits EPR to the economic responsibility type in addition to organisational responsibility, which is additional to the four types introduced by Lindhqvist (see Section 2.1). There is however no further description or explanation of EPR, and therefore the measure remains somewhat less open than was the case previously, but nonetheless is still highly flexible and vulnerable to inconsistent performances of EPR schemes across the EU (see Section 3.1).

4.1.2 Introduction of General Minimum Requirements

Minimum requirements for EPR schemes were introduced in acknowledgement that EPR schemes 'form an essential part of efficient waste management. However, their effectiveness and performance differ significantly between Member States'.[100] The minimum requirements can be summarised as:[101]

- Clearly define roles and responsibilities of all relevant stakeholders (including producers of products, organisations implementing EPR obligations on behalf of other stakeholders);
- Set waste management targets in line with waste hierarchy;
- Establish a reporting system in order to gather data on products placed on markets by producers subject to EPR, and their collection and treatment; and
- Ensure equal treatment of producers of products regardless of origin and size.

97 WEEE and other Directives in which EPR schemes are included have also affected EU conceptions and implementations of EPR schemes. These are beyond the scope of this paper in which the focus is only on the EPR scheme generally under the WFD and Directive 2018/851. This is an area recommended for further research.

98 Directive 2018/851, recital 9.

99 2008 WFD, art 8(1).

100 Directive 2018/851, recital 21.

101 2008 WFD, art 8 a(1).

Only the first minimum requirement directly links to the one identified in Section 3: the first requirement addresses the key issue covered in Section 3.2 by requiring the identification of which stakeholder bears what responsibility under an EPR scheme, but does not provide guidelines or suggestions as to what is expected, reasonable, or fair in the allocation of responsibilities.

The other requirements may address and underpin some of the advantages and disadvantages of the concept of EPR described in Section 2. The second listed requirement of setting waste management targets provides an additional instrument, which may support EPR as part of an integrated regulatory approach, as discussed in Section 2.2.

Similarly, the third requirement of reporting was not explicitly identified, but again can contribute to a mix of policy instruments and thus support an integrated regulatory approach. Furthermore, this requirement may also provide key data that can support reviews of EPR schemes to increase their effectiveness.[102] A previous review of EPR for the purpose of managing plastic waste found that EPR schemes are currently not adequately controlled or monitored to ensure effective and efficient functioning and producer compliance.[103] Reporting can ensure that schemes are monitored, though systems will need to be put in place to ensure that reports are then reviewed for monitoring purposes. There are also challenges that need to be overcome, as '[o]btaining accurate and useful data for measuring and comparing collection rates remains a significant challenge' in many regions.[104] This is potentially where technology and innovations have a role – for example, blockchains has been touted as a technology that can support general environmental governance in relation to data collection and monitoring.[105]

The last requirement of equal treatment will ensure compliance with the general requirements of the free movement of goods (which, very briefly, requires there to be no fiscal or non-fiscal barriers on goods within the EU).[106] This helps address concerns about antitrust (anti-competitive behaviour), which was identified as an issue by Clift, Lindhqvist and Lifset[107] (but have not been considered in this paper).

The minimal requirements therefore provide a good platform for improving the effectiveness of EPR schemes, as they at least recognise some of the key issues and challenges that need to be overcome for implementing EPR schemes successfully, though they do not provide detail or guidance on the details required to overcome the challenges. As a result of this openness and flexibility, it remains to see whether the minimum requirements have the anticipated effects in practice and results in increased clarity.

4.1.3 Other Amendments

Other amendments to the 2008 WFD incorporated by Directive 2018/851 include changes to include references to the general minimum requirements provision. Additionally, the 2008 WFD now also explicitly permits collective fulfilment of EPR obligations.[108] Some scholars state that collective EPR undermines the environmental benefits from EPR as it can dilute responsibility.[109] Atasu states that

> collective EPR need not be as bad as it is assumed to be. The challenges regarding the trade-offs between collective and individual EPR implementations … with respect to their cost efficiency and design implications can be overcome by smarter-cost allocations, and more research needs to be done to specifically uncover how collective EPR affects processing technology choices.[110]

102 Kaffine and O'Reilly (n 27) 4; Watkins and others (n 71) 2.

103 Watkins and others (n 71) 2.

104 Jessika Luth Richter and Rob Koppejan, 'Extended Producer Responsibility for Lamps in Nordic Countries: Best Practices and Challenges in Closing Material Loops' (2016) 123 Journal of Cleaner Production 167, 174.

105 Katrien Steenmans, Ine Steenmans and Phillip Taylor, 'Governing the Waste-Water-Energy-Food Nexus: Law and the Role of Blockchain Technology' (under review).

106 Treaty on the Functioning of the European Union [2012] OJ C326/49, arts 30, 34-37 and 110.

107 Clift (n 86) 4; Lifset and Lindhqvist, 'Trust, but Verify' (n 86) 9; Lifset and Lindhqvist, 'Producer Responsibility at a Turning Point? (n 86) 144.

108 2008 WFD, art 8 a(4)(b).

109 Watkins and others (n 71) 2.

110 Atasu (n 65) 4. See also Fleckiner and Glachant (n 78).

The advantages and shortcomings of individual and collective approaches to EPR have not been considered in this paper, but may be a relevant factor when the effectiveness of amendments are assessed in potential future research.

4.2 Developments on the Horizon

The importance of EPR for plastic waste has been highlighted by the EU Strategy for Plastics in the Circular Economy identifying it as a key tool for providing economic incentives to increase recycling and develop more sustainable plastic products.[111] This is further evidenced by its inclusion as one of the key mechanisms in the proposal for a directive on the reduction of the impact of certain plastic products on the environment.[112] This proposal has been provisionally politically agreed by the European Parliament and the Council of the European Union, and is now awaiting formal approval.[113] The proposal requires EPR schemes, as defined in Article 3(21) of the 2008 WFD, to be established for all single-use plastic products listed in Part E of the Annex (ie food containers, packets and wrappers, beverage containers, cups for beverages, tobacco products with filters and filters for use with tobacco products, wet wipes, balloons, and lightweight plastic carriers bags)[114] and fishing gear containing plastic.[115] A single-use plastic product is defined as

> a product that is made wholly or partly from plastic and that is not conceived, designed or placed on the market to accomplish within its life span, multiple trips or rotations by being returned to the producer for refill or re-used for the same purpose for which it was conceived.[116]

Definitions for plastic and fishing gear are also provided in the proposed directive by Articles 3(1) and 3(3) respectively. Extending the scope of EPR schemes is a positive and progressive step as many products are still not covered by EPR schemes – for example, only 45 per cent of product and packaging waste within the EU is covered by an EPR scheme currently.[117]

The EPR schemes in the proposed directive differ from the 2008 WFD as it explicitly requires EPR schemes to cover 'the costs to clean up litter and the costs of the awareness raising measures'.[118] This provision makes two critical contributions. First, it addresses the issue of responsibility for littering discussed in Section 3.3. Second, it highlights the key role of informative responsibility. In particular, the raising awareness measures need to inform consumers of the single-use plastic products listed in Part G of the Annex [ie the same products as those listed in Part E[119] as well as sanitary towels] and fishing gear containing plastic about the following:

> (a) the available re-use systems and waste management options for those products and fishing gear containing plastic as well as best practices in sound waste management …
>
> (b) the impact of littering and other inappropriate waste disposal of those products and fishing gear containing plastic on the environment, and in particular on the marine environment.

This is an important addition to EPR schemes, particularly as recent increased societal awareness of plastic waste problems[120] has resulted in 62 per cent of surveyed UK audiences to make lifestyle changes to reduce plastic pollution,[121] and actions such as the

111 Commission (n 14) 7, 10-13 and 15.
112 Commission (n 15) art 8.
113 European Commission, 'Single-use Plastics: Commission Welcomes Ambitious Agreement on New Rules to Reduce Marine Litter' (*European Commission – Press Release*, 19 December 2018) <http://europa.eu/rapid/press-release_IP-18-6867_en.htm>.
114 Commission (n 15) art 8(1),
115 ibid art 8(3).
116 ibid art 1(2).
117 Zero Waste Europe, 'Extended Producer Responsibility: Creating the Frame for Circular Products' (2017) <www.zerowasteeurope.eu/wp-content/uploads/2017/01/EPRpolicypaper.pdf>.
118 Commission (n 15) art (2).
119 See text to n 114.
120 See text to n 1–3.
121 BBC, 'BBC Announces Major Initiative "Plastics Watch" Following the Global Impact of Blue Planet II' (*BBC,* 23 June 2018) <www.bbc.co.uk/mediacentre/latestnews/2018/plastics-watch?lang=gd>.

proposal of the strongest ban on microbeads in the world to date in the UK.[122] As the traditional emphasis on economic responsibility has so far failed to result in widespread effective EPR schemes, the increased informative responsibility could perhaps result in bigger changes if adopted.

5 CONCLUDING REMARKS

The main contribution of this article has been as a first doctrinal exploration of the anticipated effects of amendments to the 2008 WFD as a result of Directive 2018/851. In particular, this article has focused on the new provisions affecting EPR schemes. Under the original 2008 WFD, EPR could be interpreted very widely and resulted in many different (and ineffective) approaches, and there was uncertainty regarding who was responsible for what in product-chains and how long a producer remained responsible. The amendments have addressed some of these issues. EPR is now defined, albeit still broadly – it has been narrowed to economic, and organisational responsibility, but for the rest remains a very flexible mechanism. It is expected that this will have a negligible effect on current operations of EPR schemes, as economic responsibility is already the dominant type in action. Another key amendment has been the introduction of the minimum requirements for EPR schemes, which does not resolve the issues surrounding allocation of EPR, but at least state that this must be provided when implementing such schemes. Overall, the amendments have addressed some of the issues of EPR schemes, but they have largely been limited to skimming the surface of the problems rather than addressing their crux (such as in the case of introducing a definition without addressing some of the issues of the different content and broad nature of EPR schemes). Further research is therefore needed to explore what would provide an effective solution to reap the intended benefits of EPR schemes.

Currently the impact of EPR schemes is also limited as a result of only being required at EU level for packaging waste and end of life vehicles. There is a proposal to require EPR schemes for single-use plastics, which would be an important step in expanding its scope. It must, however, be remembered that EPR cannot address the problem of plastic (or any other) waste on its own. EPR should be part of an integrated regulatory approach in which it is complemented by other mutually supportive laws and policies, such as targets and eco-design.

122 Louisa Casson, 'Microbeads – We Won' (*Greenpeace*, 21 July 2017) <www.greenpeace.org.uk/microbeads-we-won>.

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