# The U.N. International Plastics Agreement: Tackling the Plastics Crisis by Addressing Recycling Cost and Viability

*Caroline Hull*[1]



[1] Caroline P. Hull. J. D., University of California, Davis School of Law, 2024. I would like to thank Professor Albert Lin for his mentorship and feedback throughout the writing process. I owe many thanks to the editors and staff of *Environs* who helped prepare this paper for publication. I am so grateful for the love and support of my family, friends, and partner, Kevin. To my grandparents, Pat and Charlie, thank you for sowing the seeds, and to my parents, Susan and Norman, thank you for encouraging me to follow my dreams.

## I. INTRODUCTION

Recently, the plastic waste crisis has garnered increasing attention from regulators, policymakers, and scientists. Such attention can be attributed to the fact that plastic is visibly destroying ecosystems and scientific evidence increasingly demonstrates that plastic is harmful to human health.[2] As a result, in March 2022, 175 countries committed to develop an international plastics treaty ("Treaty") to tackle the plastics crisis.[3]

This paper addresses one part of the forthcoming Treaty – how to improve the likelihood and viability of recycling. I argue that the Treaty and future, related agreements should address recycling by targeting its cost. Any agreement that fails to do so is unlikely to move the needle on eliminating plastic waste. To best tackle this crisis, I recommend voluntary reductions on plastic production, various bans on single-use plastics coupled with a mandatory twenty-five percent reduction of plastic per single-use plastic product by 2035,[4] and a voluntary tax on virgin plastics. To encourage these efforts, the following additional policies are needed: standards for plastic design, composition, and labeling, a certification scheme, and mandatory reporting.

Crafting policies with an eye toward equity is critical. The negative impact of plastic waste on developing countries must be addressed by the Treaty.[5] To combat the unequal burden of plastic waste, international negotiators could establish a system of differentiated responsibilities[6] or provide other financial

---

[2] *See* Rebecca Altman & Tridibesh Dey, *The World Has One Big Chance to Eliminate Plastic Pollution*, THE ATLANTIC (Mar. 15, 2022), https://www.theatlantic.com/science/archive/2022/03/plastic-pollution-treaty-un-environmental-assembly/627066/; Hiroko Tabuchi, *The World Is Awash in Plastic. Nations Plan a Treaty to Fix That*, N.Y. TIMES (Mar. 2, 2022), https://www.nytimes.com/2022/03/02/climate/global-plastics-recycling-treaty.html; *see also* Sabaa A. Khan, *Basel Convention Parties Take Global Lead on Mitigating Plastic Pollution*, 23 AM. SOC'Y OF INT'L LAW 7 (Aug. 26, 2019).

[3] *See* Altman & Dey, *supra* note 2; Tabuchi, *supra* note 2.

[4] *See* Soumya Karlamangla, *What to Know About California's Landmark Plastics Law*, N.Y. TIMES (July 5, 2022), https://www.nytimes.com/2022/07/05/us/california-plastics-law.html (borrowing the general idea for this reduction from a new California law).

[5] *See* Press Release, Env't Programme, Plastic Pollution is an Env't Injustice to Vulnerable Communities – New Report, U.N. Press Release (Mar. 30, 2021), https://www.unep.org/news-and-stories/press-release/plastic-pollution-environmental-injustice-vulnerable-communities-new; *see*, *e.g.*, Zipporah Musau, *Plastics pose biggest threat to oceans*, U.N. – AFRICA RENEWAL (May-July 2017), https://www.un.org/africarenewal/magazine/may-july-2017/plastics-pose-biggest-threat-oceans ("Africa has not been spared the plastic menace. Even though most of the plastic trash in Africa comes from outside the continent, African cities and coastal towns are grappling with their own mountains of garbage, mostly plastic that ends up in the ocean.").

[6] *See, e.g.,* Robin Kundis Craig, *Climate Change and Common but Differentiated Responsibilities for the Ocean*, 11 CARBON & CLIMATE L. REV. 325, 329-332 (2017) (explaining how common but differentiated responsibilities "seeks to achieve equity in international relations"); *International Sustainable Development Law: Principles, Practice & Prospects*, CISDL (2002), https://www.cisdl.org/wp-content/uploads/2018/05/International-sustainable-development-law-

support for developing countries,[7] among other equity-minded policies. However, due to this paper's narrow scope, I do not explore these important issues here. Instead, I focus on improving recycling rates through cost reduction and standardization. Ultimately, however, by reducing overall plastic waste, the recommendations proposed here should have the long-term effect of lessening the environmental and health burdens experienced by disadvantaged communities.[8]

### *A. Background on Plastics*

Plastic initially entered the market in the 1950s, and its production has accelerated ever since.[9] Between 1950 and 2017, about "7,000 million of the estimated 9,200 million tons of cumulative plastic production [] became plastic waste."[10] Despite its ubiquity, plastic exposure is associated with serious health consequences like cancer and decreased fertility.[11] Such health impacts particularly affect disadvantaged communities.[12] For example, "fenceline"

2002.pdf (discussing international sustainable development law in relation to the 2002 World Summit on Sustainable Development).

[7] *See* U.N. Climate Action, Finance & Justice, https://www.un.org/en/climatechange/raising-ambition/climate-finance (last visited Jan. 9, 2024) (discussing financing options at the UN regarding climate change); *see*, *e.g.*, *Resource mobilisation*, GREEN CLIMATE FUND, https://www.greenclimate.fund/about/resource-mobilisation/gcf-2 (last visited Jan. 9, 2024) ("The Green Climate Fund (GCF) – a critical element of the historic Paris Agreement – is the world's largest climate fund mandated to support low emission, climate-resilient development pathways.").

[8] *See Plastic Pollution is an Env't Injustice, supra* note 5 (describing how "[g]overnments should also adopt and increase enforcement of bans on single-use plastics and encourage reduction, recycling and reuse" to combat the unequal burden of plastic waste).

[9] *See* Khan, *supra* note 2; Roland Geyer, *A Brief History of Plastics, in* MARE PLASTICUM – THE PLASTIC SEA 31, 34 (Marilena Streit-Bianchi et al. eds., 2020).

[10] U.N. Env't Programe, From Pollution to Solution: A Global Assessment of Marine Litter and Plastic Pollution 15 (October 21, 2021), https://www.unep.org/resources/pollution-solution-global-assessment-marine-litter-and-plastic-pollution [hereinafter From Pollution to Solution].

[11] Melissa Davey, *Plastics cause wide-ranging health issues from cancer to birth defects, landmark study finds*, THE GUARDIAN (Mar. 28, 2023), https://www.theguardian.com/environment/2023/mar/29/plastics-cause-wide-ranging-health-issues-from-cancer-to-birth-defects-landmark-study-finds. The causal relationship between microplastics and human health has been inadequately explored. *See id.* However, the impact of plastic waste on workers in the plastics business is clear: "[p]lastic production workers are at increased risk of leukaemia, lymphoma … brain cancer, breast cancer, mesothelioma … and decreased fertility," and "[p]lastic recycling workers have increased rates of cardiovascular disease, toxic metal poisoning, neuropathy, and lung cancer." *Id.*

[12] *See* U.N. Env't Programme, NEGLECTED: Environmental Justice Impacts of Marine Litter and Plastic Pollution Plastic Pollution is an Environmental Injustice, (Apr. 2021), https://wedocs.unep.org/bitstream/handle/20.500.11822/35417/EJIPP.pdf (describing how every part of the plastics lifecycle – from production to waste – impacts vulnerable communities in developed and developing countries alike); *see e.g., The rich world's plastic addiction has a social impact*, ECONOMIST IMPACT (Aug. 14, 2023), https://impact.economist.com/sustainability/social-sustainability/the-rich-worlds-plastic-addiction-has-a-social-impact (describing how despite being prohibited under the Basel Convention, developed countries often export toxic plastic waste to developing countries that cannot process the material, causing serious environmental and health

communities in the United States[13] suffer the downstream impacts of plastic production and face "higher risk for heart disease, cancer, and respiratory problems related to poor air quality."[14]

Despite increased awareness regarding plastic's negative impact, plastic production continues to expand.[15] One possible explanation is that plastic production is a revenue source for the oil industry, which faces diminishing profits as the world shifts away from fossil fuels toward renewable energy. In fact, plastics are "the key driver for petrochemicals from an energy perspective . . . outpac[ing] all other bulk materials (such as steel, aluminum, or cement), nearly doubling since 2000."[16] Frankly, this pace is not expected to slow in the near future, as plastic production is projected to double by 2040 and "be the biggest growth market for oil demand over the next decade."[17]

Virgin plastic production is an even more serious problem. Virgin plastic, unlike recycled plastics, is "produced from petrochemical or biomass feedstock used as the raw material for the manufacture of plastic products and which has never been used or processed before."[18] In other words, virgin plastic derives from new materials, therefore creating extra waste, whereas recycled plastic comes from already-in-existence plastics. Furthermore, virgin plastic is extremely inexpensive, making it much cheaper to use than recycled plastic for most consumer goods.[19] As a result, producers are not economically incentivized to use recycled plastics and instead continue to produce virgin plastics.[20] To reduce

---

problems). In the developing countries that receive this plastic waste, "[t]oxic residues can end up in the wastewater from the plastic cleaning process which can then pollute the environment surrounding the plant, while workers in recycling plants are exposed to emissions of volatile organic compounds." *Id.*

[13] *See* U.N. Env't Programme, *supra* note 12, at 28 (noting that "fenceline" communities are often located near oil refineries and other chemical-releasing facilities and are disproportionately comprised of minority and low-income individuals).

[14] *See id.* at 28 (noting how in one "fenceline" community outside of Houston, Texas "three quarters of the city's residents live within three miles of the 191 hazardous chemical facilities.").

[15] *Plastic leakage and greenhouse gas emissions are increasing*, OECD, https://www.oecd.org/environment/plastics/increased-plastic-leakage-and-greenhouse-gas-emissions.htm#:~:text=In%202019%2C%20plastics%20generated%201.8,and%20conversion%20from%20fossil%20fuels (last visited Jan. 9, 2024); Joe Brock et al., *The Recycling Myth*, REUTERS (July 29, 2021), https://www.reuters.com/investigates/special-report/environment-plastic-oil-recycling/.

[16] *Petrochemicals set to be the largest driver of world oil demand, latest IEA analysis finds*, I.E.A. (Oct. 5, 2018), https://www.iea.org/news/petrochemicals-set-to-be-the-largest-driver-of-world-oil-demand-latest-iea-analysis-finds.

[17] Brock et al., *supra* note 15.

[18] *Convention on Plastic Pollution*, ENV'T INVESTIGATION AGENCY 3 (Jan. 2022), https://apps1.unep.org/resolutions/uploads/essential_elements_-_production_and_consumption.pdf.

[19] *See* Lauren Foster, *Cheap New Plastic is Choking the World. 'It's a Recipe for Disaster.'*, BARRONS (last updated Feb. 17, 2023), https://www.barrons.com/articles/cheap-new-plastic-choking-the-world-9b318936.

[20] *See id.*

plastic production and spur recycling, these incentives must change.

Single-use plastics also pose a significant burden to reducing plastic waste. Despite recent social pressure and legislative attempts to ban single-use plastics, these efforts have been relatively ineffective.[21] According to Minderoo Foundation, an Australian nonprofit, "[f]rom 2019 to 2021, growth in single-use plastics made from virgin materials was 15 times that of recycled resins False An additional 6.6 million tons of waste was generated in 2021 compared with 2019."[22] The rise of virgin plastic production coupled with the prevalence of single-use plastics pose a serious challenge to efforts to reduce plastic pollution.

### *B. Recycling*

Historically, environmental law has tried to "have [its] cake and eat it too."[23] In other words, environmental law and policy often operate under the assumption that "addressing the root causes of environmental problems may not be necessary to accomplish environmental goals."[24] Plastic regulation has fallen into this trap. For example, in tackling plastic pollution, efforts have not focused on the "root causes" of the pollution,[25] such as plastic production. Instead, they have focused *exclusively* on recycling, which to date has barely made a dent in reducing plastic waste and pollution.[26] This effort has been encouraged by industry claiming that recycling is the answer.[27] However, despite years of recycling policy, the recycling rate in the United States is only five percent.[28] The recycling rate is similarly low in many other countries.[29] And, plastic exported by developed to developing countries for recycling purposes is often not recycled either.[30]

Clearly, recycling is not a cure-all for the plastics crisis. However, until a cheap and reliable substitute for plastic is developed, plastic is here to stay.[31] Thus, to

---

21 *See id.*

22 *Id.*

23 Albert C. Lin, *Fig Leaves, Pipe Dreams, and Myopia: Too-Easy Solutions in Environmental Law*, 98 U. COLO. L. REV. 727, 729 (2020).

24 *Id.*

25 *See id.* at 738.

26 *See id.*

27 *See id.* at 759-65.

28 *See* Foster, *supra* note 19 (citing data from the U.S. Department of Energy).

29 *Plastic Pollution is Growing Relentlessly as Waste Management and Recycling Fall Short*, OECD (Feb. 2, 2022), https://www.oecd.org/newsroom/plastic-pollution-is-growing-relentlessly-as-waste-management-and-recycling-fall-short.htm#:~:text=Globally%2C%20only%209%25%20of%20plastic,recycled%20while%2022%25%20is%20mismanaged (showing that only nine percent of plastic waste is recycled globally).

30 *See* ECONOMIST IMPACT, *supra* note 12.

31 *See* Foster, *supra* note 19 ("The world thrives on plastic—one of the most enduring, versatile materials ever invented. It's in our coffee pods, clothes, cars we drive to work, and tech devices we can't live without. Extracting ourselves from plastic-land is tough.").

solve the plastic waste problem, recycling-related efforts must be *one* part of the solution.[32] We must learn to better induce recycling of plastic products to deal with their continued production and use.

The plastic waste crisis is daunting, but there is ample room to improve recycling practices and reduce plastic waste. First, recycling rates are very low, and the plastic industry's claim that plastics are effectively recycled is largely unfounded.[33] Second, plastic production is expected to grow substantially over the next decade.[34] The fact is, if the international community does not act, the plastic waste crisis will continue to worsen. Thus, the forthcoming Treaty offers a unique opportunity to address the crisis by mandating production cutbacks and encouraging product standardization. Despite the enormity of the problem, progress can be made due to the massive gaps that exist in current practices.

### *C. Road Map*

Currently, the Treaty is being crafted by international negotiators, with the final version expected by the end of 2024.[35] Should the proposals discussed in this paper not be included in the Treaty, it will lack in critical areas – recycling viability and cost. If the Treaty does not include this paper's recommendations, negotiators should apply these proposals to future amendments to the Treaty as well as to future, related agreements.[36] Thus, while the recommendations in this paper focus on the Treaty, they are also applicable to other international efforts to deal with the plastics crisis.

In this paper, I argue that the Treaty and related future agreements tackle the plastics crisis with an eye toward recycling. Plastic production is out of hand. However, plastic serves a useful, often vital, purpose to society.[37] Recycling

---

[32] *See* Emil Cowan & Rachel Tiller, *What Shall We Do With a Sea of Plastics? A Systematic Literature Review on How to Pave the Road Toward a Global Comprehensive Plastic Governance Agreement*, FRONTIERS MARINE SCIENCE (Nov. 30, 2021) https://www.frontiersin.org/articles/10.3389/fmars.2021.798534/full.

[33] *See* Foster, *supra* note 19; OECD, *supra* note 29; Brock et al., *supra* note 15; Laura Sullivan, *How Big Oil Misled The Public Into Believing Plastic Would Be Recycled*, NPR (Sep. 11, 2020), https://www.npr.org/2020/09/11/897692090/how-big-oil-misled-the-public-into-believing-plastic-would-be-recycled.

[34] *See* Brock et al., *supra* note 15.

[35] U.N. Env't Programme, Intergovernmental Negot. Comm. on Plastic Pollution, https://www.unep.org/inc-plastic-pollution (last visited Jan. 9, 2024); U.N. Env't Programme, Plastic Treaty Progress Puts Spotlight on Circular Economy (Jan. 27, 2023), https://www.unep.org/news-and-stories/story/plastic-treaty-progress-puts-spotlight-circular-economy.

[36] *See*, *e.g.*, *Interactive Timeline – A Guide To Climate Change Negotiations*, EUROPEAN PARLIAMENT, https://www.europarl.europa.eu/infographic/climate-negotiations-timeline/index_en.html (last visited Jan. 11, 2023) (highlighting the many international climate change negotiations over the last half century and that climate change is likely to be a highly contentious topic going forward).

[37] *See, e.g.,* Altman & Dey, *supra* note 2 (describing how "[i]n some West African cities, sealed 500 ml plastic sachets are an important source of water" and for disability communities, plastic

efforts to date have proved largely inadequate in taming plastic waste.[38] Recycling is further complicated by the incredibly cheap price of virgin plastics today.[39] So long as the price of new plastics remains substantially lower than recyclable plastics, it seems unlikely that recycling will be effective.

Recycling is more likely to succeed if it makes financial sense for both the producer and consumer.[40] The key to achieving this is twofold: lowering the cost of recyclable plastics and ensuring that production of plastic is standardized. By lowering costs,[41] recyclable plastics should become increasingly affordable relative to their virgin counterparts. Then, encouraging product standardization[42] will allow producers, and all parts of the plastics supply chain, to participate in recycling these products, thereby growing the market for recyclable products and further reducing costs. Should the Treaty not adopt these policies, the resulting agreement is less likely to successfully slow and stop the plastics crisis.

In making my recommendations, I focus on mechanical recycling, rather than chemical recycling or energy recovery. Mechanical recycling entails "mechanical reprocessing into a product with equivalent properties" or one "requiring lower properties."[43] Mechanical recycling is generally more applicable to most plastics than chemical recycling – chemical recycling poses some serious challenges, including increased risks for cancer and other negative health impacts due to the release of harmful pollutants associated with the process.[44] Energy recovery can be problematic as well, as it "does not reduce the demand for fossil fuels,"[45] and

technology serves critical purposes).

[38] *See generally* Lin, *supra* note 23, at 759-65 ("Absent dramatic advances in collecting and sorting plastics, recycling diverse materials together, and redesigning products in an eco-friendly manner, plastics recycling
will continue to languish.").

[39] *See* Foster, *supra* note 19.

[40] *See* Renee Cho, *Recycling in the U.S. Is Broken. How Do We Fix It?*, COLUMBIA CLIMATE SCHOOL (Mar. 13, 2020), https://news.climate.columbia.edu/2020/03/13/fix-recycling-america/.

[41] *See* Foster, *supra* note 19.

[42] *See*, *e.g.*, Karen Raubenheimer et al., *Towards an improved international framework to govern the life cycle of plastics*, 27 REV. OF EUROPEAN, COMP. & INT'L ENV'T L. 210, 216-218 (2018) (discussing an international plastics agreement, including the importance of global industry standards generally and for recycling); *see also id.* (discussing low levels of recycling and how problematic plastic types lead to lower recycling rates).

[43] Jefferson Hopewell et al., *Plastics recycling: challenges and opportunities*, 364 PHIL. TRANS. ROYAL S. B 2115, 2118 (2009).

[44] *Breaking the Plastic Wave*, PEW 34-35 (2020), https://www.pewtrusts.org/-/media/assets/2020/07/breakingtheplasticwave_report.pdf (noting that producers and waste managers are very familiar with mechanical recycling).

[45] Hopewell et al., *supra* note 43, at 2121; *see also* Narelle Towie, *Burning issue: are waste-to-energy plants a good idea?*, THE GUARDIAN (Feb. 27, 2019, 8:12 PM EST),
https://www.theguardian.com/environment/2019/feb/28/burning-issue-are-waste-to-energy-plants-a-good-idea (discussing waste-to-energy plants in Australia and highlighting issues with the process, such as causing "an increase in CO2 and persistent organic pollutants").

there are "environmental and health concerns associated with [its] emissions."[46] For these reasons, the recycling recommendations made throughout this paper are in reference to mechanical recycling.

Part II discusses the Treaty negotiations from March 2022 through developments from the third session, which was held in November 2023. Part III discusses the criteria and factors governing my proposals. Part IV considers my recommended proposals for the Treaty, which focus on reducing the costs of plastics through both voluntary and mandatory mechanisms. In particular, I propose voluntary plastic reduction targets, various bans on single-use plastics coupled with a mandatory twenty-five percent reduction of plastic material per single-use plastic product, and a tax on virgin plastics. Next, I discuss standards for plastic design, composition, and labeling that should encourage and further decrease recycling costs. Relatedly, I offer a certification scheme that rewards manufacturers whose products use only recyclable plastics and meet various standards. Lastly, I discuss mandatory reporting.

## II. NEGOTIATIONS TOWARD A PLASTICS TREATY

In March 2022, 175 nations at the UN Environment Assembly endorsed a resolution ("Resolution") in which they agreed to negotiate a binding international agreement by the end of 2024 that would end plastic pollution.[47] The Resolution, which proposes a bottom-up approach similar to the Paris Agreement, aims to address the entire lifecycle of plastics.[48] In international law, a bottom-up approach entails that "lawmaking is a soft, unchoreographed pattern of practices externalized as law."[49] While "top-down lawmaking is a process of law instituted as practice, bottom-up lawmaking is a process whereby practices and behaviors gel as law."[50] The Paris Agreement, which addressed climate change, uses a bottom-up approach by "allowing parties to nationally determine their contributions to address climate change."[51] In other words, Paris encourages countries to adopt specific "practices and behaviors" which, when combined with the nationally determined contributions ("NDCs") from each country, create

---

[46] *See* Hopewell, *supra* note 43, at 2121.

[47] *See* Altman & Dey, *supra* note 2; Tabuchi, *supra* note 2.

[48] *See Update on Roadmap for a New Global Plastics Treaty*, GIBSON DUNN 1-4 (2022), https://www.gibsondunn.com/wp-content/uploads/2022/03/update-on-un-roadmap-for-a-new-global-plastics-treaty.pdf.

[49] Janet Koven Levit, *Bottom-up International Lawmaking: Reflections on the New Haven School of International Law*, 32 YALE J. INT'L L. 393, 395 (2007).

[50] *Id.* at 409.

[51] Daniel Bodansky, U.N. Audiovisial Library of Int'l Law, Paris Agreement 1 (2021), https://legal.un.org/avl/pdf/ha/pa/pa_e.pdf.

law.[52] This framework stands in contrast to the approach used in the Kyoto Protocol, an earlier international environmental agreement, "which prescribed emissions limitation targets from the top-down, through international negotiations."[53]

The forthcoming plastics Treaty is expected to follow the bottom-up approach by prescribing national standards and accounting for national circumstances and capabilities.[54] In fact, draft agreements appear to bear out these general predictions.[55] However, from the beginning of the negotiation process, there was disagreement over the Treaty's structure and flexibility, including whether to emphasize the bottom-up or top-down approach. After the first session in late 2022, some felt the Treaty should be a "specific legally binding convention with core obligations and control measures."[56] Others argued it should be "a framework convention with national action plans."[57] Some preferred a mixed design.[58] Relatedly, some member countries proposed bans on single-use plastics, and others argued that the focus should be on upstream plastic pollution, including voluntary measures associated with recycling.[59] The variety of approaches demonstrate the tension between pursuing voluntary measures in-line with the bottom-up approach or mandatory ones more reminiscent of the top-down approach.[60]

Generally, a country's preferred approach reflects its global standing and relative power. Early reports noted that "[t]he High Ambition Coalition of over 40 countries, including EU members, Switzerland, host Uruguay and Ghana, want[ed] the treaty to be based on mandatory global measures, including curbs on

---

[52] *See* Levit, *supra* note 49, at 395, 409.

[53] *See* Bodansky, *supra,* note 51, at 1.

[54] *See Update on Roadmap for a New Global Plastics Treaty*, *supra* note 48, at 3-4; Plastic Treaty Progress Puts Spotlight on Circular Economy, *supra* note 35.

[55] *See generally* U.N. Env't Programme, Zero draft text of the international legally binding instrument on plastic pollution, including in the marine environment, U.N. Doc. UNEP/PP/INC.3/4 (Sep. 4, 2023), https://wedocs.unep.org/bitstream/handle/20.500.11822/43239/ZERODRAFT.pdf [hereinafter Zero Draft Sep.] (noting various options, including those for national standards); U.N. Env't Programme, Revised draft text of the international legally binding instrument on plastic pollution, including in the marine environment, U.N. Doc. UNEP/PP/INC.4/3 (Dec. 28, 2023), https://wedocs.unep.org/bitstream/handle/20.500.11822/44526/RevisedZeroDraftText.pdf [hereinafter Revised Draft Dec.] (noting various options, including those for national standards).

[56] Env't Programme, U.N., Report of the Intergovernmental Negot. Comm. to Develop an Int'l Legally Binding Instrument on Plastic Pollution, Including in the Marine Env't, on the Work of its First Session 13, U.N. Doc. UNEP/PP/INC.1/14 (Mar. 2, 2022), https://wedocs.unep.org/bitstream/handle/20.500.11822/41841/UNEPINC.1-14Reportupdated.pdf?sequence=1&isAllowed=y [hereinafter Report of the Intergovernmental Negot. Comm. First Session].

[57] *Id.*

[58] *See id.*

[59] *See id.* at 12.

[60] *See id.*

production."[61] This group argued that a common regulatory framework for all countries is necessary to combat plastics pollution. Alternatively, large, petrochemical producing countries like the United States and Saudi Arabia favored voluntary approaches and a focus on recycling, advocating for country-driven approaches similar to the Paris Agreement.[62]

Representatives from two global superpowers echoed the preference for a bottom-up approach. According to Monica Medina, a United States official leading the Treaty negotiations, "[t]he best [approach] is through a Paris-like agreement that helps countries take ambitious action and holds them accountable, lets them be innovative on finding solutions, and leads to action now and not later."[63] Similarly, Hiroshi Ono, Japan's vice minister for global environmental affairs, has said that a "one-size-fits-all approach" will not work.[64]

During the second and third sessions, the agreement's vision became clearer, but the above-described concerns appeared to continue to shape the negotiation process.[65] At the second session, held from May to June 2023, the Intergovernmental Negotiating Committee ("INC") noted that "it is time to redesign products to use less plastic, particularly unnecessary and problematic plastics, to redesign product packaging and shipping to use less plastic, to redesign systems and products for reuse and recyclability and to redesign the broader system for justice."[66] Then, in November 2023, after the third session, a press release from the INC highlighted the "need to use fewer virgin materials, less plastic and no harmful chemicals," while further emphasizing the need for more efficient recycling and product disposal.[67]

At the third session, an initial draft of the Treaty was discussed and expanded upon.[68] Coverage by the United Nations Development Programme noted that the

---

61 Valerie Volcovici, *Countries Split on Plastics Treaty Focus as U.N. Talks Close*, REUTERS, https://www.reuters.com/business/environment/countries-split-plastics-treaty-focus-un-talks-close-2022-12-03/ (last updated Dec. 2, 2022, 8:54 PM PST).

62 *See id.*

63 John Geddie & Valeria Volcovici, *Exclusive: U.S. seeks allies as split emerges over global plastics pollution treaty*, REUTERS, https://www.reuters.com/world/exclusive-us-seeks-allies-split-emerges-over-global-plastics-pollution-treaty-2022-09-27/ (last updated Sep. 27, 2022, 10:41 AM PDT).

64 *Id.*

65 *See*, *e.g.*, Zero Draft Sep., *supra* note 55; Revised Draft Dec., *supra* note 55.

66 Press Release, Env't Programme, INC Chair to Prepare Zero Draft of Int'l Agreement on Plastic Pollution as Paris Negotiations End, U.N. Press Release INC-2 (June 3, 2023), https://www.unep.org/inc-plastic-pollution/media#PressRelease.

67 Press Release, Env't Programme, Third Session of Negots. on a Global Plastics Treaty Opens in Nairobi, U.N. Press Release INC-3 (Nov. 13, 2023), https://www.unep.org/inc-plastic-pollution/media#OpeningPressRelease (noting the "need to ensure that we use, reuse, and recycle resources more efficiently . . . [a]nd dispose safely of what is left over").

68 Press Release, Env't Programme, Third Session of Negots. on an Int'l Plastics Treaty Advance in Nairobi, U.N. Press Release (Nov. 19, 2023), https://www.unep.org/inc-plastic-pollution/

draft "promotes better product design to reduce plastic use and improve recycling."[69] It also highlighted that the draft captured the importance of dealing with the "types and compositions of plastics."[70] Lastly, the draft appeared to address "the difficulty and high cost of collection and separation," and the "need to limit the types of additives and plastics."[71] Despite months of negotiations, there remains significant disagreement, particularly regarding where the plastic lifecycle begins.[72] For example, one important "issue is whether to reduce or restrict the production of primary plastic polymers."[73]

Ultimately, however, a bottom-up, Paris-like approach that addresses equity concerns appears preferential. First, a revised draft released in December 2023 noted in its preamble "that each country is best positioned to understand its own national circumstances."[74] Second, there is widespread agreement that both stakeholder involvement and a just transition are critical to the agreement's success.[75] Lastly, a report from November 2023 notes that "[m]ember states generally agree on the principle of polluters paying," and the December treaty draft includes an extended producer responsibility provision.[76]

Additional drafts of the Treaty and further negotiations are expected in the near future,[77] so the exact terms of the final Treaty are not known. The fourth session was held in late April 2024, and the fifth session is expected to be held in the Republic of Korea from November 25 to December 1 in 2024.[78] This paper does not contemplate either the fourth or fifth sessions.

However, the recommendations discussed herein remain applicable regardless of the direction that negotiators take. First, the approach discussed here touches upon many of the priorities addressed by the INC already, including product design and composition. However, should the INC fail to develop a Treaty that targets the cost and viability of recycling, the Treaty may very well fall short. Second, the forthcoming Treaty is the first step taken by the international community to address the plastics crisis. However, future agreements will almost certainly be necessary to revise the Treaty or develop new agreements to deal with

---

media#ClosingPressRelease.

69 Sulan Chen, U.N. Dev. Programe, A global treaty to end plastic pollution is in sight (Nov. 22, 2023), https://www.undp.org/blog/global-treaty-end-plastic-pollution-sight.

70 *Id.*

71 *Id.*

72 *Id.*

73 *Id.*

74 *See Revised Draft Dec.*, *supra* note 55, at 6.

75 *See id.* at 5-6; Chen, *supra* note 69; *see also* Report of the Intergovernmental Negot. Comm. First Session, *supra* note 56, at 12.

76 *See* Chen, *supra* note 69; *Revised Draft Dec.*, *supra* note 55, at 6.

77 Intergovernmental Negot. Comm. on Plastic Pollution, *supra* note 35.

78 *Id.*

the crisis. If the INC does not incorporate these proposals, international negotiators should apply the recommendations both to amendments to the Treaty as well as to future agreements regarding plastic pollution. The recommendations set forth in this paper, which address recycling via cost and viability, must be adopted to reduce plastic waste in the long term.

## III. CRITERIA AND FACTORS GOVERNING MY PROPOSALS

An effective international plastics regime should lead to an increase in recycling and thus a reduction in plastic waste. However, the issues with tackling recycling are complex. According to one source, "[t]he shortcomings of recycling arise from economic forces, technological constraints, and inconsistent rules."[79] Addressing these elements will be challenging because achieving consensus is important yet parties to the agreement have varying ideas about what the Treaty should look like.[80] Accounting for these limitations, the proposals are shaped by political feasibility, technological feasibility, and effectiveness.

While feasibility and effectiveness guide the development of my proposals, it is important to also consider the factors that influence this analysis. In other words, certain factors are used to analyze whether a proposal is feasible and effective. The factors used in determining whether and how to implement these proposals were uncovered by performing research on potential solutions.[81] The factors include, but are not limited to: 1) global and industry support;[82] 2) the similarity of the proposals to other international and domestic efforts;[83] 3) the impact of the proposals on other environmental considerations;[84] 4) the availability of substitutes;[85] and 5) the role of incentives in encouraging adoption and mandates in forcing compliance.[86] By using these factors to guide the feasibility-effectiveness analysis, the proposals are similarly grounded.

Considering feasibility and effectiveness as influenced by the above-listed

---

[79] Foster, *supra* note 19.

[80] *See* discussion *supra* Part II.

[81] *See* discussion *infra* Part IV.

[82] *See* DAVID HUNTER ET AL., INTERNATIONAL ENVIRONMENTAL LAW & POLICY 542, 546-47 (6th ed. 2022) (discussing the Montreal Protocol and industry support).

[83] *See, e.g.*, *id.* at 521-557 (discussing the Montreal Protocol); *see also* discussion *supra* Part IV.B.

[84] *See*, *e.g.*, Shelie A. Miller, *Five Misperceptions Surrounding the Environmental Impacts of Single-Use Plastic*, ENV'T SCI. TECH. 14143-14151 (2020) (noting "efforts to reduce single-use plastic may distract from larger environmental issues, or worse, result in even greater environmental impacts due to unintended consequences").

[85] *See e.g., id.* (discussing alternatives and substitutes important to the CFC ban in the Montreal Protocol).

[86] *See generally* DANIEL M. BODANSKY, THE ART AND CRAFT OF INTERNATIONAL ENVIRONMENTAL LAW (2010) (discussing many elements of international treaties, including the use of carrots and sticks).

factors, I propose that the Treaty and future plastics agreements: 1) implement *voluntary* reduction targets on plastic production; 2) *ban* all non-recyclable single-use plastics by 2045, *ban* some single-use plastics, and include a *mandatory* twenty-five percent reduction of plastic amount per single-use plastic product by 2035; 3) include a *voluntary* tax on virgin plastics; 4) create *voluntary* standards for plastic design, composition, and labeling; 5) develop a certification scheme to encourage adoption of standards; and 6) *mandate* reporting of recycling efforts. Each proposal offers a different approach to tackling the crisis. Alone the proposals are insufficient, but collectively, they are designed to achieve a reduction in recycling costs and a subsequent reduction in overall plastic waste.

### *A. Weighing Political and Technological Feasibility Against Effectiveness*

The Treaty's history, as outlined above in Part II, provides some guidance for selecting the proposals.[87] First, negotiators appear to generally agree on a bottom-up approach to the Treaty (like the Paris Agreement) that prescribes some standards while also accounting for national capabilities and circumstances. [88] Second, parties agree that stakeholder involvement is critical.[89] However, disagreement appears to remain regarding the agreement's overall flexibility, including which measures should be voluntary or mandatory.[90] One would expect these tensions to endure as negotiators finalize the agreement by the end of 2024, and these divisions are unlikely to lessen as the global community continues to tackle plastic pollution in the years to come.[91] As a result, the proposals in this paper must recognize these varying priorities and aim to incorporate elements of each scheme to reach a final product that is most likely to succeed.

Furthermore, the forthcoming proposals must balance political and technological feasibility with effectiveness. By acknowledging the many interests at play and their divergent nature, the proposals are highly attuned to issues of political feasibility.[92] For example, voluntary measures should be implemented to help mitigate problems of political disagreement among and within nations.[93] Moreover, the policy proposals herein consider technological feasibility by recognizing the world's abilities and limitations in developing plastic products

---

87 *See* discussion *supra* Part II.

88 *See Update on Roadmap for a New Global Plastics Treaty*, *supra* note 48, at 3-4.

89 *See* Report of the Intergovernmental Negot. Comm. First Session, *supra* note 56, at 12.

90 *See* discussion *supra* Part II; *id.* at 12-13; *see*, *e.g.*, *Zero Draft Sep*., *supra* note 55; *Revised Draft Dec*., *supra* note 55.

91 *See*, *e.g.*, Zack Colman, *Trump pulled America out of Paris. So why are these Republicans in Dubai?*, POLITICO (Dec. 11, 2023), https://www.politico.com/news/2023/12/11/trump-republicans-cop28-dubai-climate-agenda-00131055 (describing the political nature of climate change in the United States and how Republicans may view related international negotiations).

92 *See* BODANSKY, *supra* note 86, at 165-166, 180-183 (2010).

93 *See id.* at 177-183.

and alternatives.[94] Technological feasibility can impact effectiveness by identifying what is scientifically possible, and it influences politics by shaping the domestic realities of the individual countries.

Ultimately, from both a political and technological perspective, mandatory measures are less likely to be successful or even agreed upon in the first place. And, if powerful countries like the United States, which do not support mandatory measures,[95] do not sign the Treaty, it will be less effective regardless of its terms.[96] At the same time, an agreement that exclusively relies on voluntary measures is less likely to spur action.[97] Thus, the process of weighing political and technological feasibility against effectiveness is critical to determining the shape of the proposals.[98]

## IV. RECOMMENDATIONS FOR THE PLASTICS TREATY

Developing a comprehensive agreement is critical, but here I focus on the parts of the agreement that target and implicate recycling. Achieving reductions in plastic pollution and waste require both a reduction in plastic production and an increase in the recycling rate. Reducing the cost of recyclable plastics is critical to achieving these goals.[99] Standardization should drive down recycling costs and facilitate a market in recyclable goods by making recycling easier and extending the life of plastic products.[100]

By weighing feasibility against effectiveness, I developed proposals that address plastic production, single-use plastics, virgin plastics, design-related standards, incentivizes, and reporting. On their own, the proposals are insufficient, but together they offer a path forward. Should the final Treaty not incorporate these proposals, the regime is likely to neglect a significant area of the plastics problem and fail to adequately reduce waste. Nevertheless, future amendments

---

94 *See* From Pollution to Solution, *supra* note 10, at 102-103.

95 Geddie & Volcovici, *supra* note 63.

96 *See* BODANSKY, *supra* note 86, at 159-162.

97 *See id.* at 178.

98 *See generally id.* (discussing the different considerations of states when entering an international agreement, including that "[a] state will enter into an agreement when it thinks that the benefits of doing so exceed the costs, and not otherwise").

99 *See* Foster, *supra* note 19.

100 *See* From Pollution to Solution, *supra* note 10, at 81; *Breaking the Plastic Wave*, *supra* note 44, at 62-63; Raubenheimer et al., *supra* note 42 ("Global standards can help authorities overcome the complexities of waste management and reduce the need to assess and regulate per individual product and chemical. Standards that are applicable across all markets will reduce market advantage within the private sector. End-markets for plastic waste will be more feasible if products are designed to simplify end-of-life processes."); *see also* Antaya March et al., *A new treaty process offers hope to end plastic pollution*, 3 NATURE REVIEWS EARTH & ENV'T 726, 727 (Nov. 2022) ("Incorporating reusability and recyclability standards could create a system that will extend the life of necessary plastics.").

and other related plastics agreements should use these proposals to fill in the gaps.

### *A. Reduction Goals and NDCs*

The Treaty should embrace a bottom-up approach that addresses the differentiated responsibilities and capabilities of the members.[101] In practice, this means that goals are set at the international level with action plans developed at the country level through NDCs.[102] In addition to guiding the Treaty, this methodology also provides support for the recycling efforts discussed in this paper.

Like the Paris Agreement, which set international temperature goals,[103] the Treaty should set goals on reduction in international plastic production. Such goals should increase in stringency over the course of the next thirty years, with a timeline of projected cuts for every 5 years.[104] While a mandatory cap on total plastic production would be preferable, this is unrealistic and would likely limit signatories to the agreement. Powerful countries and industry tend to support an approach like that in the Paris Agreement, which used voluntary mechanisms.[105]

The Treaty should use NDCs,[106] which are non-legally-binding mechanisms that "allow[] countries to self-differentiate their substantive mitigation contributions."[107] NDCs will allow countries to create individualized plans for achieving the overall goals of the Treaty; critical signatories are unlikely to agree to an approach that does not follow this model.[108] Thus, to effectively reduce plastic production, the Treaty should adopt a Paris-like approach.[109] A discussion of reporting requirements related to NDCs is offered in Section E below.

The projected decrease in plastic production will be a product of both the goals set by the Treaty and the subsequent NDCs developed by individual countries.

---

101 *See Update on Roadmap for a New Global Plastics Treaty*, *supra* note 48, at 3-4; Plastic Treaty Progress Puts Spotlight on Circular Economy, *supra* note 35.

102 *See e.g.*, Paris Agreement to the United Nations Framework Convention on Climate Change, Articles II, III, IV, Dec. 12, 2015, T.I.A.S. No. 16-1104 [hereinafter Paris Agreement].

103 *See id.* at Article 3; HUNTER ET AL., *supra* note 82, at 665-667.

104 *See e.g.,* BODANSKY, *supra* note 86, at 187-189 (describing how successful agreements include mechanisms that allow the parties to issue updates to respond to new developments and stay current).

105 *See* Volcovici, *supra* note 61.

106 *See* discussion *supra* Part II; Paris Agreement *supra* note 102, at Articles III, IV.

107 Bodansky, *supra* note 51, at 1.

108 *See id.;* Volcovici, *supra* note 61 (noting that "country-driven pledges [are] advocated by countries including the United States and Saudi Arabia"); Geddie & Volcovici, *supra* note 63 (explaining that the United States' position is that "a Paris-like agreement that helps countries take ambitious action and holds them accountable, let's them be innovative on finding solutions, and leads to action now and not later" is the best approach).

109 *See*, *e.g.*, HUNTER ET AL., *supra* note 82, at 666 (describing how "[t]he bottom up approach offered at least two major advantages").

Research on the effectiveness of the Paris Agreement's NDCs has found a positive correlation between ambitious target setting and credibility (measured in terms of political feasibility, not scientific feasibility) in meeting those targets.[110] This finding bodes well for the Treaty because it "debunks a commonly-raised fear about non-binding approaches and credibility: that without formal enforcement, governments would set very ambitious goals they have no intention of meeting."[111] If countries set ambitious, yet politically feasible targets, reductions are possible.[112] Thus, making the Treaty politically feasible in the first place is important. Further, by parties agreeing to reduction targets, producers may alter their practices in anticipation of domestic legislation that imposes new requirements.[113]

### *B. Single-Use Plastics*

Next, the Treaty should eliminate all *non-recyclable* single-use plastics and some *recyclable* single-use plastics by 2045. The ban on certain *recyclable* single-use plastics should provide a backstop for those items that either cannot be recycled easily or that are particularly problematic. Recyclable products that could be covered by this ban include, but are not limited to, straws, stirrers, foam containers, and bags.[114] To ensure that these bans do not result in an overall increase in the amount of plastic used in the product, I further propose a requirement that "plastic producers . . . reduce the amount of plastic in packaging by 25 percent" by 2035.[115] These proposals offer a diverse path to achieving reductions in plastic waste and increasing the cost of recyclable goods.

As a notable exception, these proposed bans should not be applied to medical-

---

110 David G. Victor, et al., *Success of the Paris Agreement hinges on the credibility of national climate goals*, BROOKINGS (Sep. 30, 2022), https://www.brookings.edu/blog/planetpolicy/2022/09/30/success-of-the-paris-agreement-hinges-on-the-credibility-of-national-climate-goals/.

111 *See id.*; *see also* David G. Victor, et al., *Determining the Credibility of Commitments in International Climate Policy*, 12 NATURE CLIMATE CHANGE 793, 793–800 (Sep. 1, 2022) (noting "the countries making the boldest pledges are also making the most credible pledges").

112 Victor et. al., *supra* note 110 ("Countries that set ambitious goals are more likely to meet them.").

113 *See* Albert C. Lin, *Making Net Zero Matter*, 79 WASH. & LEE L. REV. 679, 698-708 (2022) ("Some companies may set a net zero target in anticipation of future regulation or future markets. Shortly after President Biden's inauguration, GM announced that it would sell only electric vehicles by 2035 and achieve carbon neutrality by 2040. The move was apparently made in response to political developments and a growing belief that electric cars will soon dominate the market for new automobiles.").

114 U.N. Env't, SINGLE-USE PLASTICS: A Roadmap for Sustainability (Fact Sheet for Policymakers), https://wedocs.unep.org/bitstream/handle/20.500.11822/25523/singleUsePlastic_sustainability_factsheet_EN.pdf?sequence=1&isAllowed=y (last visited Mar. 11, 2024).

115 Karlamangla, *supra* note 4 (borrowing the general idea for this reduction from a new CA law).

related devices.[116] This exclusion should be re-evaluated in 2035 to account for technological progress in plastics and their substitutes.[117] If reliable alternatives to single-use medical plastics exist, countries should revise the Treaty accordingly.

While the effectiveness of bans on single-use plastics is contested,[118] such bans should be politically feasible.[119] Accordingly, I first analyze the effectiveness of such bans and then discuss their political feasibility.

1. Effectiveness of Bans on Single-Use Plastics

Likely, banning certain single-use plastics would be an effective tool for reducing plastic waste. However, it is important to consider whether the ban has the effect of increasing total plastic used per product, in which case the ban may be ineffective.

Some research suggests that single-use plastic bans, such as those for plastic bags, do not reduce plastic bag consumption.[120] Additionally, the production burden associated with more durable, reusable products is often higher than with single-use plastics, and there can still be a low likelihood that the reusable products are actually reused.[121] For example, a reusable polymer bag must be

---

116 *U.S. Plastics Pact's Problematic and Unnecessary Materials List*, US PLASTICS PACT (last visited Apr. 1, 2023) https://usplasticspact.org/problematic-materials/. The December 2023 draft of the Treaty even provides as an option that the Treaty not apply to "medical and health use" among other categories. *See Revised Draft Dec*., *supra* note 55 at 8.

117 *See, e.g.,* BODANSKY, *supra* note 86, at 187-189 ("[E]nvironmental agreements have an unusual need for flexibility, in order to take account of developments in our scientific understanding of environmental problems as well as the changing nature of the problems themselves.").

118 *See generally* Richard J. Kish, *Using Legislation to Reduce One-Time Plastic Bag Usage*, 38 ECON. AFFAIRS 224, 234 (June 2018) ("[R]eduction of one-time use plastic bags is a common goal, not only within the US and the UK but worldwide. Actions undertaken to promote this reduction, including bans, fees/taxes, recycling, and voluntary endeavours, have shown mixed success rates."); Andrew Macintosh et al., *Plastic bag bans: Lessons from the Australian Capital Territory*, 154 RESOURCES, CONSERVATION & RECYCLING 104638 (2020) (discussing how bag bans do not have a significant effect on plastic consumption); Bishal Bharadwaj et al., *Where is My Reusable Bag? Retailers' Bag Use Before and After the Plastic Bag Ban in Dharan Municipality of Nepal*, 120 WASTE MGMT. 494 (Feb. 2021) (discussing how bag bans are effective if accompanied by monitoring and enforcement).

119 *Three in Four People Worldwide Support a Ban on Single-Use Plastics*, YALE ENV'T 360 (Feb. 22, 2022), https://e360.yale.edu/digest/three-in-four-people-worldwide-support-a-ban-on-single-use-plastics.

120 *See generally* Kish, *supra* note 118, at 235 ("[R]estricting plastic bag use could be counterproductive. For instance, the eliminated bag needs to be replaced by something else, and this is usually a heavier multi-use bag, which is more resource-intensive to make."); Macintosh, *supra* note 118 (discussing how bag bans have not been very effective in reducing plastic bag consumption).

121 *See* Miller, *supra* note 84, at 14146 ("[I]t can be easy for consumers to fall into a reusability trap, perceiving reusable items to being preferable to disposable items, but not actually using the reusable product the requisite number of times to actually achieve an environmental benefit.").

reused once per week for one to eight weeks for the reusable bag's GHG emissions to be less than the single-use plastic alternative and for nine to twelve months "before it bec[omes] environmentally preferable in all measured impact categories, including resource depletion, human toxicity, and a variety of impacts associated with air and water pollution."[122]

These numbers are daunting and may make both a ban on certain single-use plastics and all non-recyclable single-use plastics seem misguided. However, there are a few reasons why the proposed bans can effectively reduce total plastic waste without leading to serious negative externalities.

First, some research finds that plastic bag bans do in fact reduce the use of plastic.[123] For example, in San Jose, California, within six years of implementing a plastic bag ban there was a "89% reduction in plastic bags in storm drains, a 60% reduction in creeks and rivers, and a 59% drop in residential plastic waste."[124] Furthermore, in China "[a] full ban was adopted in 2008 — and since then, plastic bag waste has dropped by 60% to 80%, an effective reduction of some 40 billion bags. The country does, however, still face enforcement issues."[125]

Additionally, one study that focused on a bag ban in Nepal, found that to be effective, bans on single-use plastic bags must be enforced over the long term and sanctions must be imposed against those who violate it.[126] The study highlighted how short-term enforcement of bag bans and minimal repercussions for violations of the ban can lead to increases in consumption of other types of plastic bags, creating more waste.[127] Here, a mandatory ban on non-recyclable single-use plastic and problematic single-use plastic would provide the longevity and assuredness that seems to make some bans effective. However, it is important to note that the aforementioned study also suggests imposing sanctions,[128] which are not contemplated in this paper.

---

122 *Id.*

123 *See* Bharadwaj et al., *supra* note 118, at 501 ("This study has two major conclusions. First, we showed that an

increase in the subjective probability of being caught is associated with reduced use of plastic bag . . . Second, we have shown that bag leakage reduces over time."); *see also* Kish *supra* note 118, at 234 (reviewing many studies on single use plastic bags and noting the following conditions necessary to successfully reduce waste: "(a) bans, fees, or recycling policies must be consistently enforced and (b) the chosen initiative must be tied to a programme that both educates and reinforces the end user of the benefits").

124 *A New Study on Plastic Bag Bans*, REUSETHISBAG.COM, https://dpw.lacounty.gov/epd/SBR/pdfs/PlasticBagsBannedAroundWorld.pdf (last visited Mar. 11, 2024).

125 *Id.*

126 *See* Bharadwaj et al., *supra* note 118, at 501; Bishal Bharadwaj et al., *What makes a ban on plastic bags effective? The case of Nepal*, 25 ENV'T AND DEV. ECONS. 95, 108, 111 (Oct. 2019).

127 *See* Bharadwaj et al., *supra* note 118, at 501; Bharadwaj et al., *supra* note 126, at 108, 111.

128 Bharadwaj et al., *supra* note 126, at 108, 111.

Furthermore, the challenges associated with the above-described reusable polymer bag (that has replaced single-use plastic bags in some cases) can be mitigated. Current bag bans aim to make bags reusable countless times. Unfortunately, this focus on "reusability" tends to add to the amount of plastic that each bag uses, possibly exacerbating plastic waste.[129] Alternatively, my proposal focuses on making single-use plastics recyclable, not necessarily reusable. In theory, less plastic should be needed to produce recyclable single-use plastics than is needed to produce reusable plastics, as the recyclable product does not need to be reused for as long.

Furthermore, for single-use plastics that the international community considers particularly problematic, full bans should be implemented. For example, when the environmental burden for a *recyclable* single-use plastic product is greater than its *non-recyclable* counterpart, a full ban on the item could be considered. Bans may cover plastic bags, considering their widespread support,[130] or they may target other products with fewer effectiveness issues. Otherwise, the requirement that producers reduce the amount of plastic in single-use plastic products by twenty-five percent should help mitigate these problems by forcing producers to make leaner items.

These proposals should cause the total amount of plastics produced to decrease as producers are forced to make recyclable products and reduce plastics use as well. Assuming effective recycling practices, plastic production should decrease, resulting in a subsequent price increase of recyclable plastics relative to non-recyclable plastics. To summarize, the proposals associated with these single-use plastic bans are likely to be effective.

2. Political Feasibility

While a total phase out of all plastics is unrealistic, a targeted phase out of certain single-use plastics and all non-recyclable plastics is perhaps possible. There are a few reasons to be hopeful. First, the Montreal Protocol offers encouraging precedent.[131] Second, there is global support for the elimination of single-use plastics, and many countries and cities around the world already have

---

[129] *See* Molly Solomon, *Is Oahu's Plastic Bag Ban Working?*, HAWAII PUBLIC RADIO (July 16, 2015), https://www.hawaiipublicradio.org/general-assignment/2015-07-16/is-oahus-plastic-bag-ban-working (describing a plastic bag ban in O'ahu, Hawaii that "allows for exceptions, including the use of a thicker plastic bag that's at least 2.25 mils thick"). One environmental advocate noted that O'ahu's new law was "almost like a plastic bag switch rather than a plastic bag ban." *Id.*

[130] *See Three in Four People Worldwide Support a Ban on Single-Use Plastics*, *supra* note 119 ("Three in four people around the world agree with a ban on single-use plastics such as bags, straws, and water bottles, according to a 28-country survey from marketing firm Ipsos and Plastic Free July, an anti-plastics campaign.").

[131] *See generally* HUNTER ET AL., *supra* note 82, at 521-547 (explaining how the urgency of the ozone depletion crisis led to rather unified support in favor of the Montreal Protocol).

single-use plastic bans.[132] Such support likely makes these bans more political feasible. Third, countries can use this support to enact more comprehensive legislation that signals a deeper moral stance on the issue of plastic waste and also has the effect of reducing waste in practice.[133]

If countries are to meet the plastic reduction goals outlined in Section A above, reduction of non-recyclable single-use plastics is likely necessary. Arguably, the mandate to reduce the amount of plastic used per single-use plastic item may be politically challenging. However, considering the downsides of single-use plastic bans, this added requirement is likely necessary to ensure the proposal's effectiveness.

In many ways, the issues posed by ozone depleting substances ("ODS"), which the international community targeted with the Montreal Protocol, and plastics are similar. The Montreal Protocol, adopted in 1987, "regulates the production and consumption of nearly 100" ODS.[134] The Protocol targeted these chemicals, including chlorofluorocarbons, because they were having a direct and profound impact on both the earth and humans.[135]

Comparing the plastic waste problem to the ODS crisis of the 1980s offers useful insight. Plastic use was historically dominated by countries like the United States, but that has started to shift.[136] Similarly, "[a]t the time of the Montreal Protocol negotiations, an estimated 75% of CFCs and halons were consumed in Europe and North America[, but] [t]he fastest growing use of CFCs and other ODSs [was] in developing countries."[137] The health effects of plastic pollution have become increasingly concerning.[138] Similarly, prior to the negotiation of the Montreal Protocol, there was evidence that skin cancer and eye cataract

---

132 *See Three in Four People Worldwide Support a Ban on Single-Use Plastics*, *supra* note 119; Foster, *supra* note 19; Cho, *supra* note 40.

133 *See* Matthew D. Adler, *Expressive Theories of Law: A Skeptical Overview*, 148 U. PENN. L. REV. 1363, 1364 (May 2000) (explaining how laws can signal moral approval or disapproval).

134 U.N. Env't Programme, About Montreal Protocol, https://www.unep.org/ozonaction/who-we-are/about-montreal-protocol (last visited Feb. 6, 2024).

135 *Id.*

136 *See e.g.,* Matthew Green, *How Plastic Took Over The World (and Created A Big Mess): A Brief, Disposable History*, KQED (Jan. 10, 2018), https://www.kqed.org/lowdown/31036/why-so-many-people-in-the-northern-triangle-are-seeking-u-s-asylum; Sarah Laskow, *How the Plastic Bag Became So Popular*, THE ATLANTIC (Oct. 10, 2014), https://www.theatlantic.com/technology/archive/2014/10/how-the-plastic-bag-became-so-popular/381065/; Axel Van Trotsenburg & Lim Jock Hoi, *Turning the tide on plastic pollution through regional collaboration in Southeast Asia*, WORLD BANK BLOGS (July 22, 2022), https://blogs.worldbank.org/en/eastasiapacific/turning-tide-plastic-pollution-through-regional-collaboration-southeast-asia.

137 HUNTER ET AL., *supra* note 82, at 530.

138 *See*, *e.g.*, *Megha* Kaveri, *Scientists Call For Global Plastics Treaty as Evidence of Health Impacts Mounts*, HEALTH POLICY WATCH (Mar. 22, 2023), https://healthpolicy-watch.news/global-plastics-treaty-monaco-ocean-week/ ("Of the more than 10,000 materials used in plastics production, some 1,254 pose high health concerns.").

occurrences would increase due to ozone depletion caused by CFCs.[139] Like the health concerns at issue during the Montreal Protocol, which helped spur cooperation,[140] health concerns abound with plastics.[141]

Despite the useful comparison that the Montreal Protocol provides, the plastics problem does differ significantly from that of CFCs, making a total elimination of plastics, like the Montreal Protocol's elimination of CFCs, unrealistic. First, CFCs could be eliminated without a total reconfiguration of consumer goods, but it is hard to say the same for plastics due to their ubiquity.[142] Additionally, the CFC bans were effective largely because of the United States' and American-industry's backing. Industry got on board with a phaseout of CFCs and even encouraged it because such a phaseout would spur a market for CFC alternatives.[143] Without formal limits on CFCs, industry players like DuPont worried that further developing substitutes would not be economically feasible.[144] Also, the CFC industry was confident that they could develop substitutes in the short term with some help from the government.[145] In other words, the phaseout did not pose a financial threat to the industry's largest players, and in fact, it was expected to be financially beneficial.

Regarding the plastics crisis, there is some industry support for better practices.[146] Additionally, society may generally favor mandatory reforms. For example, according to a poll by Ipsos, 75% of people globally support a ban on single-use plastics, with 90% saying that they support a plastics treaty.[147] Furthermore, some cities, countries, and states have banned certain single-use plastics.[148] However, unlike like the Montreal Protocol, which received strong support from the United States and industry for mandatory measures,[149] the forthcoming Treaty has struggled to garner such aggressive, uniform support from major players.[150]

---

139 HUNTER ET AL., *supra* note 82, at 541.

140 *See id.* at 542.

141 *See* Altman & Dey, *supra* note 2; Mark O'Connell, *Our Way of Life is Poisoning Us*, N.Y. TIMES (Apr. 20, 2023), https://www.nytimes.com/2023/04/20/opinion/microplastics-health-environment.html ("In a study conducted last year, in which researchers in Italy analyzed the breast milk of 34 healthy new mothers, microplastics were present in 75 percent of the samples.").

142 *See* Altman & Dey, *supra* note 2; HUNTER ET AL., *supra* note 82, at 546-47.

143 *See* HUNTER ET AL., *supra* note 82, at 546-47.

144 *Id.* at 542, 546-547.

145 *See id*.

146 *See*, *e.g.*, Foster, *supra* note 19.

147 *See Three in Four People Worldwide Support a Ban on Single-Use Plastics*, *supra* note 119.

148 *See* Foster, *supra* note 19; Cho, *supra* note 40.

149 *See* HUNTER ET AL., *supra* note 82, at 542, 546-47 (noting how the United States and industry players like DuPont strongly supported the Montreal Protocol).

150 *See* Volcovici, *supra* note 61 (according to the World Wildlife Fund, "[a]lthough in the minority, there are some powerful opponents of global rules and standards, which risk potentially

Considering the support for a general ban on single-use plastics, the proposals here should be somewhat tolerable. Though the twenty-five percent reduction poses a feasibility challenge, its inclusion is important, and there is time to implement it with the deadline set for 2035.

Relatedly, theories of expressive assumptions of law[151] may offer support for the ban. The theory conveys "that the action of a legal official or official body can indeed be meaningful, and that the meaning thus attached to an official action is relevant to, if not determinative of, the moral status of that action."[152] In other words, making a statement with regards to single-use plastics may be impactful due to the message it conveys to those affected and by showing that plastics should not be used trivially. Globally, there is already support for bans on single-use plastics.[153] If the public were to appreciate some of the shortcomings of these bans, they could perhaps be convinced that an additional step would be needed to make the ban wholly effective. Additional legislation would not only signal a moral position on the issue of plastic waste but also reduce plastic waste in practice.

There are known negative externalities associated with single-use plastic bans. However, single-use plastics remain incredibly problematic, contributing greatly to plastic waste and microplastic (and nanoplastic) contamination.[154] Thus, addressing single-use plastics is critical.

### *C. Voluntary Tax on Virgin Plastics*

The IPA should allow and encourage countries to impose a tariff on all products containing virgin plastics as they enter the importing country as well as an equivalent tax on domestically produced virgin plastics. The tax would increase the price of virgin plastics relative to recyclable plastics, making recycling viable and cost effective.[155] This proposal is necessary because a ban on single-use plastics does not sufficiently target virgin plastics. If the cost of virgin plastic

---

weakening obligations on countries to take action"); Geddie & Volcovici, *supra* note 63 ("Industry groups have been lobbying governments, including the U.S., to reject any deal that would limit plastic manufacturing.").

151 *See generally* Elizabeth S. Anderson & Richard H. Pildes, *Expressive Theories of Law: A General Restatement*, 148 U. PA. L. REV. 1503 (2000) ("At the most general level, expressive theories tell actors-whether individuals, associations, or the State-to act in ways that express appropriate attitudes toward various substantive values.").

152 Adler, *supra* note 133, at 1364.

153 *See Three in Four People Worldwide Support a Ban on Single-Use Plastics*, *supra* note 119.

154 James Doubek, *Researchers find a massive number of plastic particles in bottled water*, NPR, https://www.npr.org/2024/01/10/1223730333/bottled-water-plastic-microplastic-nanoplastic-study (Last updated Jan. 10, 2024) (noting "[a]bout 80% of plastic ends up in landfills or the environment" and "[r]esearchers from Columbia University and Rutgers University found roughly 240,000 detectable plastic fragments in a typical liter of bottled water").

155 *See* Foster, *supra* note 19.

remains low, companies may continue to produce significant amounts of it instead of relying on the more expensive recycled plastics.[156]

As a mandatory measure, this proposal would likely be politically infeasible. It would require countries to commit to a domestic tax and could also raise sovereignty concerns.[157] Even as a voluntary measure, however, this tax will likely face a political challenge. Countries that produce a significant amount of virgin plastic could be opposed to this proposal as a voluntary measure because the tax could cause the price of their goods to increase relative to non-virgin plastic products, leading to competition issues.[158] Despite this challenge, it is critical to tackle virgin plastics in the agreement due to their role in causing plastic pollution.[159] The voluntary nature of the tax should be significantly more politically feasible than that of a mandatory measure. Moreover, the effectiveness of the policy at raising the cost of virgin plastic would be notable if implemented.[160] This effectiveness should be weighed accordingly.

The proposal also implicates the General Agreement on Tariffs and Trade's ("GATT") "like products" and "national treatment challenge" analyses.[161] According to GATT, products from different countries should be "accorded treatment no less favourable than that accorded to like products of national origin in respect of all laws, regulations and requirements."[162] Relatedly, taxes "should not be applied to imported or domestic products so as to afford protection to domestic production."[163]

While a fuller analysis is needed to evaluate the proposal's compliance with the GATT, at first cut, it seems to satisfy it.[164] There is no one approach to determine whether products are "like."[165] However, virgin plastics are distinguished by their composition – "properties and quality of the product" – not only the industrial

---

156 *See id.* (highlighting the low cost of virgin plastics and that "[i]t has become very expensive to use recycled materials, and that's not going to change anytime soon.").

157 *See* BODANSKY *supra* note 86, at 160-161 (noting "the sovereignty cost to the country assuming a commitment").

158 *See id.* at 162 ("Decisions about whether to participate in an international environmental agreement implicate other interests as well. For example, international environmental agreements can affect a state's competitiveness.").

159 *See* Foster, *supra* note 19 ("Yet growing demand, especially in emerging markets, incentivizes production of virgin plastic — now more than 500 million tons a year.").

160 *See id.* (noting "[n]ew 'virgin' plastic costs substantially less than recycled plastic in major segments of consumer goods," which "mak[es] it tougher for companies to cut down on plastic").

161 The General Agreement on Tariffs and Trade, Article I, III, Oct. 30, 1947, 61 Stat. A-11, 55 U.N.T.S. 194..

162 *Id.* at Article III.

163 *Id.*

164 *See* HUNTER ET AL., *supra* note 82, at 1243-1245.

165 *See id.* at 1248.

process used to make them.[166] This bodes well for making a like products determination for a tariff on virgin plastics that satisfies the GATT. In other words, virgin plastics are not "like products" to non-virgin plastics. Furthermore, the corresponding domestic and import tax for virgin plastics would help defend against an Article III "national treatment challenge" because the tax would be applied equally.[167]

### *D. Uniform Standards that Incorporate Stakeholder Input*

Next, I propose voluntary standardization measures for plastic design and composition. The aforementioned proposals are crafted to increase recycling by reducing its costs. To work toward this goal, the Treaty should set voluntary standards for plastic production[168] and provide incentives to encourage their adoption to further reduce these costs.[169]

The Resolution highlights "the importance of promoting sustainable design of products and materials so that they can be reused, remanufactured or recycled and therefore retained in the economy for as long as possible."[170] Moreover, news coverage from November 2024 regarding the draft Treaty provides that the "types of additives and plastics" should be limited to reduce the difficulty and cost of recycling.[171] Furthermore, the Resolution also calls for "action by all stakeholders, including the private sector," and "cooperation at the local, national, regional and global levels."[172] Subsequent sessions appear to echo these same considerations.[173]

Current international recycling standards are weak.[174] As a result, plastics remain low value due to "their inherent lack of recyclability, their degradation

---

166 *Id.*

167 *See id.* at 1244-45.

168 *See* BODANSKY *supra* note 86, at 182 ("International agreements seek to encourage participation through a variety of design elements" such as "flexible and contextual standards."); Raubenheimer et al., *supra* note 42 (discussing the importance of voluntary standards); March et al., *supra* note 100, at 727 (noting how "reusability and recyclability standards" could be used for "necessary plastics"); *see also Breaking the Plastic Wave*, supra note 44, at 63 ("Design for recycling can increase recycling rates worldwide by raising the yield and value of recycled plastic, thereby improving the profitability of the mechanical recycling industry.").

169 *See* Raubenheimer et al., *supra* note 42, at 217 ("Global guidelines and codes of practice can assist companies in preparing for testing of new products and make certification or recognition more cost-effective."); *see also* discussion *supra* Part VI.B; *cf.* March et al., *supra* note 100, at 727 ("Midstream policies that target plastic use will require behavioural incentivization to support more determined approaches to the reduction, reuse, and subsequent recycling of plastic.").

170 U.N. Env't Programme, Res. 5/14, U.N. Doc. UNEP/PP/OEWG/1/INF/1, at 3 (May 10, 2022).

171 Chen, *supra* note 69.

172 U.N.E.P. Res. 5/14, *supra* note 170, at 4.

173 *See* Zero Draft Sep., *supra* note 55; Revised Draft Dec., *supra* note 55.

174 *See* From Pollution to Solution, *supra* note 10, at 80.

during use, and the limited demand for their reuse."[175] However, "[d]esign for recycling interventions can increase both the yield and value of recycled plastic, improving the economics by US$120 per metric ton and virtually doubling recycling profitability."[176] Furthermore, plastic can be recycled in many ways, but "the ease of recycling varies among polymer type, package design and product type."[177] Setting production standards for plastics that address these features should make recycling easier and grow the market for recyclable goods. Standards should tackle product design, advise against using multiple plastic polymers within a single item, and institute a plastic labeling system to account for revised standards.[178]

A voluntary approach to standard setting is likely more politically feasible than a mandatory approach. Furthermore, voluntary standards should encourage higher levels of treaty adoption in the first place. Countries are unlikely to agree to strict requirements that impact major industries and large swaths of the economy.

A wide variety of groups should be included in the development of these standards. Diverse stakeholder representation is a key feature of the Resolution and is encouraged generally in international environmental treaty making.[179] Such groups could include industry, recycling operators, waste collection companies, local, state and national governments, informal waste pickers, and environmental groups.[180] Diverse stakeholder representation is paramount in this process to ensuring effectiveness of the standards and the resulting Treaty. For example, if waste operators and collectors are left out from development discussions and cannot accommodate the proposed standards, the Treaty is likely to be ineffective and inequitable. If relevant parties are excluded, the Treaty will face political and technological challenges that would threaten the impact of the proposals.

As discussed in Section E of this Part, to make effective the voluntary standards, the Treaty must incentivize their adoption.[181] For example, the Treaty should include a certification scheme that rewards manufacturers whose products

---

175 *Breaking the Plastic Wave*, supra note 44, at 63.

176 *Id.* at 62.

177 Hopewell et al., *supra* note 43, at 2119.

178 *See id.* at 2117-2120; From Pollution to Solution, *supra* note 10, at 80-81; *Breaking the Plastic Wave*, *supra* note 44, at 63-65.

179 Report of the Intergovernmental Negot. Comm. First Session*, supra* note 56, at 12.

180 *See* Chen, *supra* note 69 (highlighting "the role that informal waste pickers play in environmentally sound waste management"); Brock et al., *supra* note 15 (describing many of the players involved in plastics production and recycling, specifically corporations); Cho, *supra* note 40 (highlighting efforts by local and national governments to deal with plastic waste and recycling); *see also* Tabuchi, *supra* note 2 ("In the United States and elsewhere, the cost of recycling is typically borne by cash-strapped municipal governments, as opposed to manufacturers.").

181 *See, e.g.,* BODANSKY *supra* note 86, at 226-228 ("Rather than focus on enforcement, international environmental regimes have taken a different tack, attempting to encourage and facilitate compliance, rather than to deter and prevent non-compliance.").

use only recyclable plastics and adopt some of the standards. Countries should also be encouraged to implement domestic policies that incentivize certification. Without these measures, manufacturers who incorporate plastic into their products may have little incentive to rely on recyclable plastics rather than the non-recyclable plastics they already use.

1. Design

Plastic design should be standardized such that plastics can be recycled and remain in the economy for as long as possible. Not all plastics are easily recyclable, and even those that are recyclable are not recycled at a high rate.[182] However, the design of many plastics significantly impacts the likelihood that they are recycled.[183] The following standardization proposals will "improve the quality of the output [and] strengthen the secondary market while reducing costs in the recycling process."[184]

Flexible and multilayer plastic are particularly problematic for a number of reasons, and their continued production should be minimized where feasible. [185] Instead, standards should encourage the production of rigid plastics and mono-material plastics to improve recycling.[186] Shifting to mono-material plastics means that consumer packaging products should be made from one type of plastic material and not have multiple pieces of different plastic types. In practice, for example, this could mean eliminating the thin plastic wrap that circles most plastic water bottles in favor of ink directly on the bottle that does not impact the bottle's recyclability.[187]

Moreover, rigid plastics are generally preferable to flexible plastics because they can be reused more easily and have a higher value.[188] Flexible plastics have

---

[182] *See* Foster, *supra* note 19 ("Yet with more than 35 million tons of plastic waste produced by U.S. households each year, and just 5% recycled, it would take a massive investment in recycling facilities to bring up rates sharply.").

[183] *See generally Breaking the Plastic Wave*, *supra* note 44 (discussing, at length, design options that could improve recycling).

[184] *See id.* at 63.

[185] *See* Hopewell et al., *supra* note 43, at 2119 ("[R]igid containers consisting of a single polymer are simpler and more economic to recycle than multi-layer and multi-component packages.").

[186] *See id.* at 2119.

[187] *See Better product design and recycling can curb plastic waste*, ECONOMIST IMPACT (Apr. 20, 2021), https://impact.economist.com/ocean/ocean-health/better-product-design-and-recycling-can-curb-plastic-waste [hereinafter *Better Product Design and Recycling*]; *see*, *e.g.*, Zoe Wood, *Tesco to stop sale of plastic-wrapped multipacks in stores*, THE GUARDIAN (Jan. 23, 2020, 7:01 PM EST), https://www.theguardian.com/business/2020/jan/24/tesco-to-stop-sale-of-plastic-wrapped-multipacks-in-stores (describing companies reducing their plastic waste in packaging).

[188] *See* Hopewell et al., *supra* note 43, at 2123-2124; *see also Breaking the Plastic Wave*, *supra* note 44, at 63.

a low weight to volume ratio that makes them less economically viable.[189] Furthermore, flexible plastics comprise many single-use items that have high leakage rates into the ocean.[190] However, in some instances, switching to mono-material plastics that are flexible may be preferable to mono-material plastics that are rigid due to the extra weight that rigid plastics incur. Such weight may carry an environmental burden not outweighed by the more recyclable plastic.[191] Though, with single-use plastics, a ban on certain products is possible, as discussed in Section B above.[192]

To that end, standards should discourage the use of lightweight, flexible plastic as a tool to limit the amount of plastic used.[193] Using lightweight plastic does not contribute to a decrease in plastic waste but rather encourages waste. Most lightweight plastic is discarded almost immediately after use and tends to break down more quickly.[194] Furthermore, the use of less plastic per unit will not guarantee less plastic is used in reality, as companies aim to increase their sales and produce more units overall.[195] For example, many lightweight plastics comprise mini packages, which is when there is much more packaging than the amount of product inside – think of a small shampoo bottle.[196] However, design standardization, in combination with the aforementioned mandatory twenty-five percent plastic reduction discussed in Section B above, will prevent such wasteful practices.

Some plastic products are made unrecyclable when unnecessary additives, including colorants, stabilizers and flame retardants, are included in plastics.[197] These additives can be "difficult to trace or remove and can contaminate plastic or make it unsafe or unusable in new products."[198] Redesigning plastics so that they do not contain dyes, plastics pigments, and additives is critical. These additives are "one of the biggest barriers preventing recyclers from creating recycled quality that can compete with virgin output."[199]

For example, PET is an easily recyclable type of plastic used in drink bottles, but adding dye to the plastic, which is done often, makes the plastic much harder

---

189 *See* Hopewell et al., *supra* note 43, at 2124.

190 *Breaking the Plastic Wave*, *supra* note 44, at 63.

191 *See id.* at 63-64.

192 *See* discussion *supra* Part VI.B.

193 *Lightweight Plastic Packaging*, PLASTIC SOUP FOUNDATION, https://www.plasticsoupfoundation.org/en/plastic-problem/bogus-solutions/lightweight-packaging/ (last visited Apr. 1, 2023).

194 *Id.*

195 *Id.*

196 *Id.*

197 *Breaking the Plastic Wave*, *supra* note 44, at 64.

198 *Id.*

199 *Id.*

to process.[200] The economic demand (in terms of recycling) is for neutral colors, which align with the color of virgin plastics, not colored plastics.[201] In fact, the value of clear PET is twenty-five percent higher than colored PET.[202] Thus, the Treaty should provide that no unnecessary additives be included in plastics products, particularly when done for purely commercial purposes. Furthermore, as advocated by the U.S. Plastic Pact, the Treaty's design standards should call for the elimination of non-detectable pigments like carbon black, an unnecessary additive that hinders recycling.[203]

Design standards are important because if producers are thoughtful about the packaging that they develop, the economic value of that packaging should be greater, and markets should develop to meet new economic demands.[204] This process, along with the other policies, should help tackle the issue of cheap virgin plastics and make recycling economical.

2. Plastic Composition

Additionally, the Treaty should include standards for plastic composition, including plastic types and plastic mixtures within products. Not all plastic products are the same, so these standards need to consider the cost-effectiveness and practicability of different plastic types. Plastic is often broken down into the following seven categories, listed in order of increasing recycling difficulty: 1) PET, 2) HDPE, 3) PVC, 4) LDPE, 5) PP, 6) PS, and 7) miscellaneous.[205]

Plastics like PVC, PP, and PS are particularly problematic because they are difficult to recycle and can easily contaminate an entire plastic waste stream.[206] PP is the second most common plastic in the world, but only one percent of it has ever been recycled.[207] Finding alternatives to these plastics can be challenging. However, Styrofoam (made of PS) has been banned in a few jurisdictions and has a few viable substitutes.[208] For example, "[a]lternatives to [Styrofoam] are

---

200 *See Better Product Design and Recycling*, *supra* note 187.

201 *Breaking the Plastic Wave*, *supra* note 44, at 64.

202 *Id.*

203 *U.S. Plastics Pact's Problematic and Unnecessary Materials List*, *supra* note 116.

204 *See* Foster, *supra* note 19; *see generally Breaking the Plastic Wave*, *supra* note 44, at 10 ("[D]esign[ing] products and packaging for recycling [could] expand the share of economically recyclable plastic from an estimated 21 per cent to 54 per cent.").

205 *See* Foster, *supra* note 19; *Recycling Codes*, PLASTIC SOUP FOUNDATION, https://www.plasticsoupfoundation.org/en/plastic-problem/what-is-plastic/recycling-codes/ (last visited Apr. 1, 2023).

206 *Breaking the Plastic Wave*, *supra* note 44, at 64; Cho, *supra* note 40.

207 Cho, *supra* note 40.

208 *See* Manu Chandra et al., REAL COST OF STYROFOAM, Saint Louis Univ. (Nov. 22, 2016), https://greendiningalliance.org/wp-content/uploads/2016/12/real-cost-of-styrofoam_written-report.pdf ("Many cities and counties across the United States have enacted, or are considering, bans on Styrofoam products."); *Polystyrene & Food Packaging*, MASSACHUSETTS SIERRA CLUB,

biodegradable paper or woodenware, compostable bioplastics; or highly recyclable aluminum."[209] However, like the debate with plastic bag bans, many argue that bans on Styrofoam packaging have large negative externalities.[210] On the other hand, PET and HPDE are two of the more regularly recycled plastics.[211] However, in the United States they are still only recycled at 18.5% and 9%, respectively.[212] Ultimately, the Treaty must address varying degrees of polymer practicability.

First, the Treaty should standardize the preference for PET and HDPE over other plastic types. By focusing on these two recyclable types of plastics, producers should be able to achieve significant technological gains that increase profitability and therefore improve recycling totals and rates for these materials. Second, the Treaty should include a standard that calls for the near elimination of PS plastics and plastics in the miscellaneous category.[213] Importantly, miscellaneous plastics have almost no recycling potential because they are unidentifiable.[214]

There are "thousands of different plastic types (even under a single-polymer name) and multiple formats, which inhibits the quality guarantee of the recyclate."[215] Standards should encourage industry to limit plastics produced within a single polymer group if the plastic has a high propensity for disrupting recycling streams. Further, the standards should create a new label, as elaborated upon below, to identify the particular plastic type within the polymer.

The Treaty should also include a standard that encourages single-polymer products over multi-polymer products. Limiting multi-polymer products will improve recycling processes for sorters (as well as consumers tasked with putting plastics in their bins), "ultimately increasing recycling yields and reducing costs."[216] The issue of multi-polymer products is tied to product packaging design as well. The Treaty should recommend that plastic products limit problematic ink and re-design labels such that they do not contaminate waste streams. Meaning, inks and labels should be recyclable too.[217] These seemingly innocuous aspects of

---

https://www.sierraclub.org/massachusetts/polystyrene-food-packaging (last visited Apr. 19, 2023) (noting that "[b]ans on polystyrene food items are in place all over the world" but there are alternatives to the product).

209 *Polystyrene & Food Packaging*, *supra* note 208.

210 Katherine Martinelli, *Is the 30-Year-Long Styrofoam War Nearing Its End?*, JSTOR Daily (Oct. 9, 2018), https://daily.jstor.org/is-the-30-year-long-styrofoam-war-nearing-its-end/.

211 *See* Foster, *supra* note 19.

212 *See id*.

213 Cho, *supra* note 40 (describing how in 2021, a bill was proposed in the United States Congress called the Break Free From Plastic Act that included a ban on polystyrene).

214 *Recycling Codes*, *supra* note 205.

215 *Breaking the Plastic Wave*, *supra* note 44, at 64.

216 *See id.* at 65; *see also* Hopewell et al., *supra* note 43, at 2117-2119.

217 *Breaking the Plastic Wave*, *supra* note 44, at 64; *see* Hopewell et al., *supra* note 43, at 2118-

a plastic product can contaminate recycling processes, thereby reducing the economic value of recycling.[218]

If producers achieve these standards for single polymer composition, the value of plastic goods should increase.[219] Thus, recycling should become more profitable, increasing the amount of recycled (not virgin) plastic products and improving recycling rates.

3. Labeling

The Treaty should also implement a labeling scheme for plastics. Historically, labelling efforts have been problematic.[220] For example, the seven number system mentioned above is largely ineffective.[221] Furthermore, the plastics industry has pushed recycling and labeling as a solution to the plastics problem when, in reality, it knows that recycling is unlikely.[222] Labels can be fully inaccurate, and often, they fail to facilitate recycling because the plastic products cannot be recycled in the first place (and there is no market for the goods).[223] Thus, labeling is not a catch all solution to plastics pollution, and the Treaty would be ill-advised to implement a labelling standard on its own. However, if the above standards are widely adopted, standardizing labels will be important to facilitate the market in recycled goods.[224]

The Treaty should develop international standards for labeling that align with the standards described above for plastic design and composition. First, products that contain multiple polymers or dyes must indicate such on the relevant piece of plastic so that consumers and sorters will know not to recycle mixed polymer plastics, which can contaminate the entire recyclable batch.[225] Second, products

2119 (discussing the added difficulties of recycling materials with inks or pigments).

218 *See generally* Hopewell et al., *supra* note 43 (describing how various contaminants can disrupt the recycling process); Lin, *supra* note 23, at 762 ("[C]ontamination, which occurs when nonrecyclable items are mixed with recyclables or when recyclable materials are not separated or cleaned, can make an entire batch of material unusable. Rising use of customized plastics and products made of multiple materials further hampers plastics recycling efforts.").

219 *See generally Breaking the Plastic Wave*, *supra* note 44 (discussing the importance of plastic design and composition and how "[m]echanical recycling is not profitable in high-income countries if the cost of collection and sorting is accounted for"); Foster, *supra* note 19 (discussing the issue of low recycling levels and how there are many different plastic types, each treated differently).

220 *See* Lin, *supra* note 23, at 759-62.

221 *Id*.

222 *See id.* at 760-62.

223 *See* Hiroko Tabuchi & Winston Choi-Schagrin, *California Aims to Ban Recycling Symbols on Things That Aren't Recyclable*, N.Y. TIMES, https://www.nytimes.com/2021/09/08/climate/recycling-california.html (Updated Sep. 9, 2021).

224 *See* From Pollution to Solution, *supra* note 10, at 81 ("A key conclusion is that the development of clear labelling standards is vital to help reduce the risks of plastic pollution and associated hazards in the marine environment.").

225 *Breaking the Plastic Wave*, *supra* note 44, at 64-65.

comprised of multiple pieces of plastics (rather than a mix of polymers in one plastic material) should indicate the type of plastic on each piece.[226] As of now, the various types of plastics included in the different pieces are often noted at "the bottom of the box."[227] This does not distinguish between the pieces and makes recycling unnecessarily challenging. Third, a label should be used to distinguish plastics produced within a polymer group that have a high propensity for disrupting recycling streams (as discussed above).[228] Identifying the particular plastic type within the polymer is important to limiting contamination.

### *E. Certification Scheme*

The Treaty should incentivize adoption of these standards by creating a certification scheme that rewards manufacturers whose products use only recyclable plastics and adopt many of the proposals described above. [229] The scheme could also target products made by manufacturers engaged in extended producer responsibility.[230] The certification would be performed by an outside organization tasked with administering the scheme, reviewing product information, and issuing certificates to compliant parties.[231]

In implementing such a scheme, ensuring reliability and maintaining credibility is critical.[232] Inputs should be carefully vetted by the organization before certifications are granted. There are potentially high costs for a certification scheme like this, particularly for small producers in developing countries. To counteract this, the scheme should encourage large manufacturers to bear the initial costs and incentivize certification by offering discounts for manufacturers that submit multiple products for certification. Also, the Treaty should encourage countries to adopt domestic policies that either mandate or encourage certification. Domestic policies could include subsidies for companies that achieve certification or country-wide targets that set goals for participation in the certification program.

---

226 *See id*.

227 *See id.* at 65.

228 *See generally* Hopewell et al., *supra* note 43 ("A major challenge for producing recycled resins from plastic wastes is that most different plastic types are not compatible with each other because of inherent immiscibility at the molecular level, and differences in processing requirements at a macro-scale.").

229 *See e.g.,* Raubenheimer et al., *supra* note 42, at 216 (discussing "[l]abelling and certification schemes (recycled content, appropriate disposal, hazard potential)"); *cf.* BODANSKY *supra* note 86, at 205-207 (discussing the barriers to implementation for international agreements).

230 *EXTENDED PRODUCER RESPONSIBILITY (EPR)*, BEYOND PLASTIC, https://www.beyondplastics.org/epr (last visited Apr. 2, 2023).

231 *See e.g., id.; cf.* BODANSKY, *supra* note 86, at 233-235 (discussing compliance mechanisms with treaties generally and noting that "promoting implementation and compliance" should focus on information gathering, encouraging future compliance, and discovering non-compliance).

232 *See id.* at 233.

Certified products should signal to consumers that the brand is making the push toward increasing recycling and employing more sustainable practices.[233] This scheme aims to increase the demand for recyclable plastic goods by improving information and credibility and therefore increasing the value of recyclable plastics.

### *F. National Reporting*

Finally, the Treaty should include a national reporting scheme to ensure accountability among member nations and track progress toward meeting the Treaty's goal. The Resolution provides that the Treaty should "specify national reporting, as appropriate," and "periodically assess the progress of implementation of the instrument."[234] Thus, parties should be required to submit reports on NDC progress as well as recycling efforts. This approach should mirror the reporting framework from the Paris Agreement, which requires biennial transparency reporting, sharing information among parties, technical expert review of such information, multilateral discussions regarding progress, and improvement plans.[235] Country-level reporting should improve transparency,[236] encourage collective action toward achieving the desired reductions, and help assess success. By requiring that this information be shared with the international community, countries can learn from each other's experiences and possibly better collaborate to develop innovative technologies.[237]

National reporting should include information that ensures the international community is properly apprised on progress toward the Treaty's goals. Namely, reporting should capture the country's efforts regarding voluntary reductions in total plastic production, various bans on single-use plastics and corresponding reductions in total amounts of plastic per single-use product, and the optional tax on virgin plastics. It should also account for the standardization of plastic design, composition, and labeling. Relatedly, changes in types of recycled products and market demand for recycled products should be reported to encourage compliance with standards and understand whether the standards are working to improve recycling rates.[238] Additionally, reports should include a description of local waste

---

233 Lin, *supra* note 113, at 705.

234 *See* U.N.E.P. Res. 5/14, *supra* note 170, at 4.

235 *See* Paris Agreement, *supra* note 102, at Article XIII (noting that developed countries are *required* to share information with developing countries); HUNTER ET AL., *supra* note 82, at 676-677.

236 *See* HUNTER ET AL., *supra* note 82, at 675-677.

237 *See generally* BODANSKY, *supra* note 86, at 238-243 ("Through the sharing of information in reports, states may also learn about policy options or technologies they had not previously considered.").

238 U.N. Climate Change, Transparency, https://unfccc.int/Transparency (last visited Apr. 24, 2023); Environmental Investigation Agency, *Convention on Plastic Pollution: Toward a New Global Agreement to Address Plastic Pollution*, 8 (June 2020), https://eia-international.org/wp-

management being undertaken to deal with the plastics crisis.[239] If products are not collected in a sound manner, they may never actually be recycled, making these proposals ineffective.[240]

Lastly, the Treaty should require that countries report on the certification scheme described in Section E above. Reports should include a description of the steps taken by the country to encourage certification. Furthermore, data on the types and quantities of companies and products that have acquired certification should be provided. Tying the certification scheme to this mandatory reporting requirement should improve transparency and encourage further adoption of standards that lead to certification. As discussed, increased adoption should reduce recycling costs. Mandatory reporting should also reduce concerns that the certification program induces greenwashing, as it demands at least some compliance.[241] A reporting scheme of this nature will promote effectiveness of the Treaty by ensuring accountability and improving information flow among the international community.

## V. CONCLUSION

Curbing plastic waste requires a massive international effort. Recycling is just one part of reducing plastic waste and creating more sustainable practices. For recycling to be effective, its costs must be lowered, and its practices must be standardized.[242]

Together, the proposals described in this paper address these issues by balancing political and technological feasibility against effectiveness. Analyzed at length in Part IV, I conclude here by briefly summarizing the feasibility-effectiveness determinations for each proposal.

The various bans on single-use plastics and the mandatory twenty-five percent reduction of plastic in single-use plastic products by 2035 raise concerns of political feasibility and effectiveness. Political feasibility is a challenge due to the mandatory nature of the proposals, but there is widespread support for bans on single-use plastics, and there would be ample time to implement the proposals.[243]

---

content/uploads/EIA-report-Convention-on-Plastic-Pollution-single-pages-for-print.pdf; *see generally* Raubenheimer et al., *supra* note 42 (discussing the importance of reporting obligations); *cf.* March et al., *supra* note 100, at 726-27 (noting generally how "[w]ithin the treaty process, it will be essential to agree on a harmonised suite of metrics for reporting and measuring national and global progress").

239 *See supra* note 180 and accompanying text; *cf.* Raubenheimer et al., *supra* note 42 ("Keeping pace with a rapidly innovating plastics industry is challenging for most national and local governments.").

240 Cho, *supra* note 40.

241 Lin, *supra* note 113, at 708.

242 *See* Foster, *supra* note 19; *Breaking the Plastic Wave*, *supra* note 44, at 62.

243 *See Three in Four People Worldwide Support a Ban on Single-Use Plastics*, *supra* note 119;

Issues with effectiveness can be mitigated, especially by incorporation of the plastic reduction mandate. By eliminating some plastic products entirely, requiring all single-use plastics to be recyclable, and reducing plastic amounts per package, the cost of recyclable plastics should decrease.

These proposals are paired with a voluntary tax on virgin plastics, which should further increase the cost of virgin plastics relative to recyclable plastics.[244] However, the tax faces a political challenge, as it would raise the cost of goods. Despite likely pushback from petroleum- invested countries, a tax would be highly effective in addressing a root problem of recycling: cheap virgin plastics.[245] Thus, this proposal would further improve the economic value of recycling by raising the price of virgin plastics relative to recyclable ones.

Voluntary standards for design, composition, and labeling aim to make recycling easier and more effective, thereby reducing its cost.[246] However, standards are burdened by issues related to technological feasibility, effectiveness, and practicability. Furthermore, voluntary standards alone are likely insufficient. There is little incentive for producers to exert significant costs to adopt standards that may not have much value on their own.[247] Thus, I recommend a certification scheme and subsequent domestic policies to strengthen the effectiveness of the standardization program.

Mandatory reporting, including the above-described certification scheme, would further bolster these proposals. However, mandated reporting raises political and technological feasibility concerns along with effectiveness. At the same time, the policy should face less pushback due to the similarity of the scheme to the Paris Agreement, to which parties have already agreed.[248] By improving transparency, reporting should bolster credibility and encourage participation and collaboration.[249]

The final terms of the Treaty are unknown at this time, and this paper does not contemplate Treaty developments from the fourth or fifth sessions. Regardless, however, the proposals set forth in this paper remain relevant. Creating an effective Treaty is a steep challenge, and there is no single solution to the plastics crisis. However, for plastic waste to be reduced, recycling cost and viability must

---

*cf.* BODANSKY, *supra* note 86, at 186 ("The framework convention-protocol approach allows states to address a problem in a step-by-step manner rather than all at once. States tend to be willing to join a framework convention because it does not contain stringent obligations.").

244 *See* Foster, *supra* note 19.

245 *See id.*

246 *See id.*; *Breaking the Plastic Wave*, *supra* note 44, at 62.

247 *See* BODANSKY, *supra* note 86, at 228-233 (discussing the costs of compliance for parties to international agreements).

248 Paris Agreement, *supra* note 102, at Article XIII & XV.

249 *See* Transparency, *supra* note 238; *Convention on Plastic Pollution: Toward a New Global Agreement to Address Plastic Pollution*, *supra* note 238, at 8.

be addressed.

If the proposals outlined in this paper are implemented, the Treaty should effectively reduce the costs of recyclable plastics such that the economic outlook for recycling improves and total plastic production decreases. If, however, the Treaty fails to incorporate these proposals, the Treaty is unlikely to reach its full potential in mitigating the international plastic crisis. In this case, future international agreements to tackle the plastics crisis should use the proposals discussed in this paper to address the holes in the plastics scheme – namely, recycling practicability.