The Chinese Blockade on Imported Recyclables and the Illusory Rise of Green Consumerism

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I. INTRODUCTION

The United States exports much of its plastics to foreign countries, such as China, to be cleaned or processed into small plastic pellets.[1] These plastic pellets are then packaged and either sold or shipped back to the United States to produce "green" goods.[2] China processed 31% of American plastic waste; however, in 2018, it introduced the National Sword.[3] The National Sword was broadly a ban on imported waste, "including several

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1. VOLZA, https://www.volza.com/p/plastic-pellet/import [https://perma.cc/Z84J-Z757].

2. GREENPATH, https://greenpathrecovery.com/recycled-plastic-pellets [https://perma.cc/LUD5-BS86].

3. Christian Blanco, Calvin Spanbauer & Sara Stienecker, *America's Broken Recycling System*, CAL. MGMT. REV. (May 30, 2023), https://cmr.berkeley.edu/2023/05/america-s-broken-recycling-system/ [https://perma.cc/JF3X-B7UJ].

types of plastics and other recyclable waste."[4] Legislation gradually tightened until January 1, 2021, when it enforced a comprehensive ban on all imported solid waste and stopped issuing licenses to foreign entities.[5] The ban on imported solid waste has since left American recycling practices in a frenzy.

On the positive side, China's blockade and climate change campaigns have incentivized American energy production and innovation. As the public views plastic waste as a considerable public burden,[6] engineers and corporations have invested in several modes of recycling. Pyrolysis, a chemical recycling process, has gained significant attention from large corporations as a proposed solution.[7] Simply, pyrolysis converts plastic waste pellets into hydrocarbon feedstocks, which are then used to create building blocks for ethylene and propylene.[8] In other words, pyrolysis eliminates physical plastic waste by converting it into oil that may be used for energy. Several large corporations (e.g., Dow, BASF, and Exxon) are going all-in on building chemical plants for pyrolysis.[9] Alternatively, plastic pellet re-processors have contracted with corporations to source post-consumer feedstocks for manufacturing eco-conscience products.[10]

However, China's ban has left a hole in global recycling practices and forced both developed and developing countries to confront the issue themselves.[11] The United States, for example, has redirected certain recyclables to landfills and looked for other waste management solutions.[12] Countries can no longer live the fantasies of NIMBYism[13] and pass along their responsibilities. The principle of NIMBYism, or "Not In My Backyard," notoriously influences environmental law and expresses the sentiment that individuals and corporations alike avoid negative ecological externalities related to capitalism and consumerism.[14] China's ban on imported recyclables is a textbook application of NIMBYism, as they attempt to minimize air pollution as it relates to industrialism and the melting of

4. Martina Igini, *What Are the Consequences of China's Import Ban on Global Plastic Waste?*, EARTH.ORG (Apr. 7, 2022), https://earth.org/chinas-import-ban [https://perma.cc/8TJ2-ABQ7].

5. *Id.*

6. JITKA STRAKOVÁ ET AL., PLASTIC WASTE MANAGEMENT AND BURDEN IN CHINA 20 (2022), https://ipen.org/sites/default/files/documents/ipen-china-2021-epa_v1_2.pdf [https://perma.cc/PUP2-KTD3].

7. Alexander H. Tullo, *Amid Controversy, Industry Goes All In On Plastic Pyrolysis*, CHEM. & ENG'G NEWS (Oct. 10, 2022), https://cen.acs.org/environment/recycling/Amid-controversy-industry-goes-plastics-pyrolysis/100/i36 [https://perma.cc/MJD5-G4XH].

8. *Id.*

9. *Id.*

10. Chantal Carriere & Rachael Beavers Horne, *The Case for a Legislated Market in Minimum Recycled Content for Plastics*, 50 ENV. L. REP. 10042, 10044 (2020).

11. Chloe Skye, *Our Plastic Crisis Has Made NIMBYism Global*, EARTH911 (Jan. 26, 2021), https://earth911.com/business-policy/exporting-plastic-recycling-global-nimbyism [https://perma.cc/WCA3-7YQF].

12. Cory Nealon, *UB Study Reports Impact of Chinese Policy on U.S. Recycling*, UBNOW (Apr. 1, 2022), https://www.buffalo.edu/ubnow/stories/2022/04/chinese-policy-recycling.html [https://perma.cc/BV62-LVZZ].

13. Skye, *supra* note 11.

14. Stephen Eldride, *Negative Externality*, BRITANNICA, https://www.britannica.com/topic/negative-externality [https://perma.cc/CH82-2ZTR] ("[T]he imposition of a cost on a party as an indirect effect of the actions of another party. Negative externalities arise when one party, such as a business, makes another party worse off, yet does not bear the costs from doing so.").

plastics.[15] In other words, China's ban is a method of protecting localized air quality and reflects negative externalities onto the countries producing such waste.

Though recycling is a promising solution to addressing climate change issues, modern recycling practices pose their own complications. For example, when otherwise recyclable materials are placed in waste receptacles without proper cleaning, the materials become contaminated.[16] Often, recyclables are contaminated by food remnants and redirected to landfills.[17] Once viable materials are selected and sorted, we are faced with the more complex issues of who, what, and where.[18] That is, who is in the best position to take on material waste? What do we personally do with waste? Alternatively, what do we, as a society, do with waste? Finally, where does the waste ultimately land?

Attempting to answer policy questions of such magnitude is daunting as decisions are consequentially linked. This Note discusses core tensions between domestic and international recycling practices as well as the intersectional impact on corporate bodies, green consumerism, and public policy. A comprehensive approach is needed to fully address the nuances of the plastic industry. To remedy the issue, the United States government should implement policies to maximize social responsibility, build out the reusable economy, ratify the existing Basel Convention, and enforce a new international plastics treaty.

II. BACKGROUND

A. Plastic Production and Mass Waste Importation

China's plastic output is unparalleled by any other country and has continued to increase steadily since the 1980s.[19] In 2019, Chinese plastic production reached a staggering 95.741 million metric tons and accounted for 31% of all plastics produced, making it the top producer globally.[20] 70% of plastics produced are major synthetic resins, which are used to create disposable plastic products.[21] According to the 2019 IPEN Report, China's output of plastic products hit a staggering 70 million tons.[22] Though continued mass production may lead one to believe that waste is a nonissue, China's domestic recycling system

15. Yanhua Deng & Guobin Yang, *Pollution and Protest in China: Environmental Mobilization in Context*, 214 CHINA Q. 321, 321 (2013).

16. *What Happens if You Put Non-Recyclable Items into Recycling?*, VALLEY WASTE SERV. (Oct. 31, 2019), https://www.valleywasteservice.com/valley-waste-news/what-happens-if-you-put-non-recyclable-items-into-recycling-4034 [https://perma.cc/LU44-5W43].

17. *Id.*

18. *See What Really Happens to Your Plastic 'Recycling'*, PLASTIC POLLUTION COAL. (May 16, 2022), https://www.plasticpollutioncoalition.org/blog/2022/5/16/what-really-happens-to-your-plastic-recycling [https://perma.cc/UCF7-X5VU].

19. STRAKOVÁ ET AL., *supra* note 6, at 6.

20. *Id.*

21. *Id.*

22. *Id.* at 7.

struggles to keep pace.[23] They are both "the global leader in plastic production and one of the most polluting countries in the world."[24]

While the country profits from mass production and global consumption, industrialism comes at a hefty cost.[25] Since the rise of the plastic import and export industry, China has been unofficially referred to as the "world's dumping ground."[26] China's importation business grew exponentially after it joined the World Trade Organization in 2001 as there was a "dramatic increase in its demand for raw materials due to rapid industrial development."[27] From 1992 to 2016, China imported a cumulative total of 170 million tons of waste plastics.[28] In 2019 alone, China had net-imported 27.125 million metric tons of the world's synthetic plastic resins.[29]

The world's dumping ground is not merely a wasteland, however. Seizing the profitable opportunities of industrialism, China quickly became a well-known and heavily relied upon powerhouse of the waste-recycling industry.[30] The country has invested considerable resources in building factories and various plants for processing the world's waste.[31] Many developed countries, including Japan and the United States, relied heavily on China's waste processing business.[32] China accepted international waste because they had low contamination standards and competitive pricing.[33] China engaged in the recycling business because "[f]avorable rates for shipping in cargo vessels . . . coupled with the country's low labor costs and high demand for recycled materials, made the practice profitable."[34] The United States has benefitted from outsourcing its waste to less developed countries.[35] In

23. *See* Tom Miles, *China Says it won't Take Anymore Foreign Garbage*, REUTERS (July 18, 2017), https://www.reuters.com/article/world/china-says-it-wont-take-any-more-foreign-garbage-idUSKBN1A31MA [https://perma.cc/R77F-9X6V] (explaining that "China's speedy industrial development has seen it struggling to regulate waste disposal, leading to toxic waterways and cities blanketed in smog.").

24. Igini, *supra* note 4.

25. Miles, *supra* note 23.

26. *See* Adam Minter & Faye Flam, *Now China Refuses to Be Dumping Ground for the World's Waste, Where on Earth Will it All Go?*, S. CHINA MORNING POST (July 9, 2018), https://www.scmp.com/magazines/post-magazine/long-reads/article/2154105/now-china-refuses-be-dumping-ground-worlds-waste [https://perma.cc/W2Y2-H3EZ] (explaining how China refuses to continue to take on the world's waste).

27. Igini, *supra* note 4.

28. *See* STRAAKOVÁ ET AL., s*upra* note 6, at 9 (discussing calculated data that was analyzed from the UN Comtrade Database).

29. *Id.* at 8.

30. Aaron Mak, *Why Does Half of the World's Used Plastic End Up in China?*, SLATE (June 21, 2018), https://slate.com/technology/2018/06/why-china-import-half-world-used-plastic.html [https://perma.cc/253L-GEV7] (explaining that the rise of plastic-related industrialism in China was facilitated by cheap labor costs and a "wave of reforms that had lifted many of the government's controls on the economy").

31. *See id.* (explaining that the government is now moving resources to big conglomerates).

32. Igini, *supra* note 4.

33. Cheryl Katz, *Piling Up: How China's Ban on Importing Waste Has Stalled Global Recycling*, YALE ENV'T 360 (Mar. 7, 2019), https://e360.yale.edu/features/piling-up-how-chinas-ban-on-importing-waste-has-stalled-global-recycling [https://perma.cc/L2YL-CSVC].

34. *Id.*

35. Joseph Winters, *Rich Countries Are Illegally Exporting Plastic Trash to Poor Countries, Data Suggests*, INVESTIGATE W. (Apr. 18, 2022), https://www.invw.org/2022/04/18/rich-countries-are-illegally-exporting-plastic-trash-to-poor-countries-data-suggests [https://perma.cc/F76R-6WTT] (explaining that wealthy countries, such as the United States, have exported more than 800 million pounds of plastic waste to lesser developed countries).

2018, the United States filled and exported 157,000 shipping containers of waste to less developed countries with poor waste management systems.[36]

The United States, along with other developed countries, exports its waste not only because it is profitable for manufacturing but also because of waste's negative externalities.[37] NIMBYism is the strong opposition individuals or municipalities feel towards developments they do not want in their communities due to the development's unpleasant or harmful effects.[38] NIMBYism "connotes the unwillingness of individuals to accept the construction of large-scale projects by corporations or governmental entities nearby, which might affect their quality of life and the value of their property."[39] In this case, waste plastics and their requisite industrial factories produce substantial physical and chemical pollution of the air, water systems, wildlife, and human beings.[40] Contaminants from plastic "not only disrupt the natural environment but also work their way up the food chain to impact human health and safety, including through microplastics."[41] Industrialism can also be visually displeasing and have sociological consequences.[42] Developed countries are thus motivated by technological advancement and exploit less developed countries to shoulder its externalities and plastic waste.[43] In other words, developed countries keep their metaphorical yards clean and tidy while the yards of developing countries are filled with microplastics and smog.

What does "processing" waste plastics entail, and why has it been so profitable? Once imported plastic waste is sorted, it is either used for energy recovery or material recovery.[44] In the instance of energy recovery, incinerated solids generate heat and power.[45] Materials recovery is more nuanced and can be further separated into physical or chemical recovery.[46] Physical recovery may involve one of three methods: (1) melting and processing, (2) separation of solids using solvent, or (3) solid-phase processing.[47] All physical recovery, however, is ultimately developed into new non-virgin plastic products.[48] "Physical recovery is the main method for recovery of high-value plastic[s] waste in China."[49] Broadly

36. Jan Dell, *157,000 Shipping Containers of U.S. Plastic Waste Exported to Countries with Poor Waste Management in 2018*, PLASTIC POLLUTION COAL. (Mar. 6, 2019), https://www.plasticpollutioncoalition.org/blog/2019/3/6/157000-shipping-containers-of-us-plastic-waste-exported-to-countries-with-poor-waste-management-in-2018 [https://perma.cc/DM36-F5NH].

37. *Id.*

38. Peter D. Kinder, *NIMBY*, BRITTANNICA (Sept. 12, 2024), https://www.britannica.com/topic/NIMBY [https://perma.cc/VH6Y-KQ8Z].

39. *Id.*

40. *See Plastic Pollution*, U.N. ENV'T PROGRAMME, https://www.unep.org/plastic-pollution [https://perma.cc/2XEC-7CFB]; Mohammad Mafizur Rahman, Khosrul Alam & Eswaran Velayutham, *Is Industrial Pollution Detrimental to Public Health? Evidence From the World's Most Industrialized Countries*, 21 BMC PUB. HEALTH no. 1175, 2021, at 1 (discussing plastic pollution's public health and environmental consequences).

41. Carriere & Horne, *supra* note 10, at 10044.

42. Rahman, Alam & Velayutham, *supra* note 40, at 6 (discussing the relationship between industrial pollution and death rates within industrial cities).

43. Winters, *supra* note 35.

44. STRAKOVÁ ET AL., *supra* note 6, at 13.

45. *Id.*

46. *Id.* For the purposes of this Note's analysis, chemical recovery will be confined to pyrolysis. *See infra* Part III.D.

47. STRAKOVÁ ET AL., *supra* note 6, at 13.

48. *Id.*

49. *Id.*

speaking, physical recovery involves the creation of plastic pellets, which are then sold to manufacturing companies to create new "green products."[50]

B. Chinese Legislation and Ban on Imported Plastics

Though some claim that China is classified as a developing country, it is the second-largest economy in the world.[51] Given its significant role in both the production and importation of plastics, China has pledged to implement policy and reach carbon neutrality by 2060.[52] China's action was also presumably prompted by the Paris Agreement and its commitment to "demonstrate global leadership."[53] The Paris Agreement requires international cooperation of member countries and for them to take individualized steps to reduce global emissions by 45% by 2030 and be net-zero by 2050.[54] China's obligation for change was undoubtedly more severe than other pledged countries due to its size and proportional role in emissions.[55] Alternatively, other bound countries may be able to reach carbon neutrality more easily as they are developed and do not bear the burden of industrialism domestically.[56] It is easier for wealthy developed nations to meet the Paris Agreement's emission goals without causing a global riff because their local economies are more based on technology and services as opposed to industrialism.[57]

Effective January 1, 2021, "the Ministry of Ecology and Environment stopped issuing import licenses from overseas as part of a series of policies . . ." to push the industry to confront its plastic processing.[58] Also, in 2021, China set forth a five-year plan to phase out "manufacturing and circulation of single-use plastics" and invest in greener practices.[59] Given the scale of the Chinese economy, the ban on imported plastics and related policies has caused more than a mere ripple in trade and recycling.[60] Before China's ban, "95% of

50. Patagonia uses recycled polyester from plastic bottles to make outerwear. *Recycled Polyester*, PATAGONIA, https://www.patagonia.com/our-footprint/recycled-polyester.html [https://perma.cc/WBL6-W4DG]; *see also DASANI and Sprite Boost Sustainability Packaging Credentials in North America*, COCA-COLA CO. (July 27, 2022), https://www.coca-colacompany.com/media-center/dasani-sprite-boost-sustainability [https://perma.cc/W92V-WV4B] (describing how beverage company Coca-Cola works to make their green products).

51. U.N. Affairs, *China Headed Towards Carbon Neutrality by 2060; President Xi Jinping Vows to Halt New Coal Plants Abroad*, U.N. NEWS (Sept. 21, 2021), https://news.un.org/en/story/2021/09/1100642 [https://perma.cc/263C-X7NC]; Bloomberg News, *How China Plans to Become Carbon-Neutral by 2060*, BLOOMBERG (Oct. 26, 2021), https://www.bloomberg.com/news/articles/2021-08-10/how-china-plans-to-become-carbon-neutral-by-2060-quicktake (on file with the *Journal of Corporation Law*).

52. U.N. Affairs, *supra* note 51.

53. Bloomberg News, *supra* note 51.

54. Paris Agreement, Dec. 15, 2015, 3156 U.N.T.S. 79; *For a Livable Climate: Net-Zero Commitments Must be Backed by Credible Action*, U.N., https://www.un.org/en/climatechange/net-zero-coalition [https://perma.cc/5TUA-LVBG].

55. Hongqiao Liu & Xiaodying You, *Q&A: What Does China's New Paris Agreement Pledge Mean for Climate Change?*, CARBON BRIEF (Dec. 16, 2021), https://www.carbonbrief.org/qa-what-does-chinas-new-paris-agreement-pledge-mean-for-climate-change [https://perma.cc/AL62-TMUF].

56. Bo Meng et al., *Developing Countries' Responsibilities for CO2 Emissions in Value Chains Are Larger and Growing Faster Than Those of Developed Countries*, 6 ONE EARTH 167, 181(2023).

57. *Id.*

58. Igini, *supra* note 4.

59. *Id.*

60. *Id.*

the plastics collected for recycling in the European Union and 70% in the United States were sold and shipped to Chinese processors."[61] Experts estimated that the ban would displace over 100 million metric tons of plastic waste by the year 2030.[62] China's import ban and commitment to carbon neutrality are further supported by domestic policy and a five-year action plan to eliminate single-use plastics.[63] A notable target in their five-year plan was to eliminate plastic bags that are produced and used in the context of retail and restaurant dining.[64]

C. Public Policy and Practice Post-Legislation

America's recycling system is broken, as only 32.1% of waste is recycled or composted.[65] Once recycled, there are five additional steps necessary to reduce waste:

> (1) a material recovery facility decides which products to accept, (2) consumers buy products, then dispose of waste and recyclables, (3) logistics company does curbside recyclable collection, (4) material recovery facility screens materials for contamination, (5) raw recyclables are sorted into individual streams, (6) sorted recyclables are sold as non-virgin inputs for manufacturing, (7) manufacturers make products from non-virgin materials[66]

China's import ban has left a hole in stages four through seven and reflected the burden of waste back onto the United States.[67] Concerningly, the 32.1% of waste that is "recycled" may not be recycled but rather hauled to landfills or other countries with poor recycling infrastructure.[68]

Exporting waste to less developed countries is a method developed countries employ to say they "recycle" without confronting the negative side effects themselves.[69] Since China's import ban, there has been a stark increase in plastic waste shipments to other countries that are not equipped to safely manage them.[70] The United States independently ships 78% of (0.83 metric tons) of its plastic exports to countries with considerable waste mismanagement rates.[71] Until receiving countries deny waste; our plastics will be shipped to pollute their air, waters, and health.

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61. Katz, *supra* note 33.

62. Igini, *supra* note 4.

63. Yujie Xue, *China Ramps up Efforts to Tackle Plastic Pollution with Five-ear Action Plan*, S. CHINA MORNING POST (Sept. 16, 2021), https://www.scmp.com/business/china-business/article/3149010/china-ramps-efforts-tackle-plastic-pollution-five-year [https://perma.cc/NQG5-5H8D].

64. Igini, *supra* note 4.

65. Blanco, Spanbauer & Stienecker, *supra* note 3.

66. *Id.*

67. Igini, *supra* note 4.

68. Blanco, Spanbauer & Stienecker, *supra* note 3.

69. Helena Varkkey, *By Exporting Trash, Rich Countries Put Their Waste Out of Sight and Out of Mind*, CNN (July 29, 2019), https://www.cnn.com/2019/07/29/opinions/by-exporting-trash-rich-countries-put-their-waste-out-of-sight-and-out-of-mind-varkkey/index.html [https://perma.cc/MVG2-YTQL].

70. Dell, *supra* note 36.

71. *Id.*

D. Private Firm Investment in Pyrolysis

One proposed solution to America's recycling industry is pyrolysis (also referred to as chemical recycling).[72] Pyrolysis is "the chemical decomposition of organic (carbon-based) materials through the application of heat" to "transform[] organic materials into their gaseous components" and pyrolytic oil.[73] It has numerous applications in the interest of green technology as it can break down material goods, such as plastics, into useful components, hence "lessening [the] environmental burden."[74] In addition to eliminating physical waste, experts claim that this thermochemical conversion technology may "supplement or replace petroleum-based energy."[75] Chemical recycling of plastics via pyrolysis thus has the potential to greatly reduce physical waste while generating new energy. Though mechanical recycling dominates the industry, some firms argue that plastic pyrolysis has the potential to fill in gaps and shortcomings.[76] Large chemical companies have joined smaller firms or invested in their own "pyrolysis plants for converting plastic waste into hydrocarbon feedstocks that can be turned into plastics again."[77]

Environmentalists vehemently oppose pyrolysis, however, undercutting its plausibility as a potential solution to climate change.[78] There is an undeniable tension between normative mechanical waste plastic practices and pyrolysis because the incineration component of pyrolysis inevitably involves the burning of plastic, which releases emissions as well.[79] Another critique of pyrolysis is that it is too specialized to become a widespread practice or a magic wand solution.[80] Pyrolysis facilities do not accept the mixed plastic waste they so claim.[81] Meaning, it is only a minor solution that is redirecting the pollution.[82] Environmentalists argue that "pyrolysis is a greenwashing scheme meant to fool the public into thinking plastics are recycled more than they actually are."[83]

E. Present American Recycling Law

To remedy the waste problem, state and federal governments have implemented both grants and tax credits to municipalities, NGOs, and education groups that recycle or use

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72. *Id.*

73. Sarah E. Boslaugh, *Pyrolysis*, BRITANNICA (Aug. 7, 2024), https://www.britannica.com/science/pyrolysis [https://perma.cc/2VNJ-7WGT].

74. *Id.*

75. *Id.*

76. Tullo, *supra* note 7.

77. *Id.* Dow, BASF, Shell Ineos, Braskem, and TotalEnergies have invested in pyrolysis. *Id.*

78. Cheryl Hogue, *Chemical Recycling of Plastic Gets a Boost in 18 U.S. States—But Environmentalists Question Whether it Really is Recycling*, CHEM. & ENG'G NEWS (May 15, 2022), https://cen.acs.org/environment/recycling/plastic-recycling-chemical-advanced-fuel-pyrolysis-state-laws/100/i17 [https://perma.cc/JU7T-FAT4].

79. *Id.*

80. Muhammad Saad Qureshi et al., *Pyrolysis of Plastic Waste: Opportunities and Challenges*, 152 J. ANALYTICAL & APPLIED PYROLYSIS, no. 104804, 2020, at 1.

81. *Id.* at 2.

82. *See generally id.*

83. Geoff Parker, *How Big Companies Around the World Are Reducing the Use of Plastics*, LABELSERVICE (Mar. 31, 2023), https://labelservice.co.uk/how-big-companies-around-the-world-are-reducing-the-use-of-plastics [https://perma.cc/G8PJ-7M54] (summarizing the arguments of chemical engineer Jan Dell).

non-virgin plastics for manufacturing.[84] On a state level, there are income tax credits, property tax exemptions, and sales tax exemptions available.[85] For example, some states offer income tax credits for recycling companies or manufacturers that purchase recycling equipment.[86] On a federal level, the IRS offers companies a tax allowance for "the depreciation of certain types of conservation and renewable-energy properties."[87] The Department of Energy also offers grants to states with valid recycling programs.[88] Lastly, the Environmental Protection Agency (EPA) largely holds an educational role and offers information to companies regarding available state grants and tax policy.[89]

III. ANALYSIS

A. Adaptation in Industrial China

Chinese climate policy prioritizes adaptation over mitigation.[90] China largely relies on its ability to "mobilize vast resources to build infrastructure, change land use patterns, implement focused industrial policies, relocate large populations, and direct funds and human resources to critical research and development priorities."[91] While Western countries view climate change solutions through a lens of mitigation— likely a result of domestic greenhouse gas emissions and perceived severity of the issue at hand.[92] China and the United States are the largest greenhouse gas producers globally.[93] However China's emissions alone "exceed[] those of all developed countries combined."[94] Furthermore, China is confronted with the consequences of its emissions daily due to intense heat, dense smog, frequent flooding, and serious water shortages.[95] Adaptation and investment, as opposed to mitigation of climate change, is perhaps the only viable option because economic and societal roots are deeply intertwined with industry.[96] Chinese urban development has been characterized by a phenomenon referred to as "industrial sprawl," which is the rapid spreading of industrial land use in response to expanding industrial employment.[97] "Although industrial sprawl has contributed greatly to urban expansion and economic development in China, it is characterized by high pollution, high carbon emissions, and inefficient

84. Michael Evans, *Recycling Tax Credit for Businesses*, CHRON., https://smallbusiness.chron.com/recycling-tax-credit-businesses-22594.html [https://perma.cc/M586-B9RP].

85. *Id.*

86. *Id.*

87. *Id.*

88. Evans, *supra* note 84.

89. *Id.*

90. Mallie Prytherch, Kenneth G. Lieberthal & Ryan Hass, *Unpacking China's Climate Priorities*, BROOKINGS (Aug. 23, 2023), https://www.brookings.edu/articles/unpacking-chinas-climate-priorities/ [https://perma.cc/49JM-YETX].

91. *Id.*

92. *Id.*

93. *Id.*

94. *Id.*

95. Prytherch, Lieberthal & Hass, *supra* note 90.

96. *See* Mak, *supra* note 30 (outlining China's history of plastic use while emphasizing their industrial prerogatives).

97. Lu Zhang et al., *The Industrial Sprawl in China from 2010-2019: A Multi-Level Spatial Analysis Based on Urban Scaling Law*, 19 INT'L J. ENV'T RSCH. & PUB. HEALTH, no. 16255, 2022, at 1.

use."[98] Industrial sprawl exacerbates environmental sustainability issues that accompany urban, economic, and societal development.[99] Adaptation is thus the lower-cost option due to the consequences of industrial sprawl and pledged carbon reduction under the Paris Agreement.[100] China pledged to lead global carbon initiatives and reduce their carbon emissions by 60–65%.[101] Abrupt policy change to adapt is ultimately a result of domestic climate concerns, industrial dependence, and the Paris Agreement.[102] The ban on imported recyclables is but one of many adaptive methods employed by the Chinese government to confront environmental problems readily knocking at their door.[103]

B. Impact and Response

China's ban on imported plastics has not caused a ripple effect but rather a tsunami of global change as countries rush to fill the void. On a positive note, China's aggressive climate change policies have shocked the global economy and spurred climate initiatives amongst developed and developing countries.[104] Alternatively, and perhaps more realistically, China's ban has shifted and dispersed its share of the global recycling industry to other developing countries with inadequate infrastructure to properly dispose of plastic scraps.[105] For example, other developing countries, such as India, may step into the shoes of China as a major global waste trade importer.[106] While this poses an economic opportunity for other developing countries, the environmental consequences may persist due to "improper management and high leakage rates."[107]

Displacement of plastics alters the global economy and pushes other countries to confront the climate crisis.[108] However, there are concerns about whether plastic consumption and climate change can wait for the market to react.[109] Forcibly displacing and inevitably delaying recycling plastics is dangerous as the issue merits quick policy change from many, if not all, actors.[110] China and the United States are key players[111] and the largest carbon emitters, yet they wear the badge of honor and claim sustainability while developing countries bear the burden of their carbon-reduction policies and plastic elimination campaigns.[112] For Chinese and American climate initiatives to be legitimate, there must be international coordination among industry and government. However, bold policy change

98. *Id.* at 11.
99. *Id.* at 12.
100. *Id.*
101. *How is China Managing its Greenhouse Gas Emissions?*, CHINA POWER, https://chinapower.csis.org/china-greenhouse-gas-emissions [https://perma.cc/R3T4-BLYU].
102. *Id.*; Skye, *supra* note 11; U.N., *supra* note 54.
103. Prytherch, Lieberthal & Hass, *supra* note 90; Qureshi et al., *supra* note 80.
104. Skye, *supra* note 11.
105. Winters, *supra* note 35.
106. Zhe Liu, Michelle Adams & Tony R. Walker, *Are Exports of Recyclables From Developed to Developing Countries Waste Pollution Transfer or Part of the Circular Economy?*, 136 RES. CONSERVATION & RECYCLING 22, 23 (2018).
107. Katz, *supra* note 33.
108. Igini, *supra* note 4.
109. *Id.*
110. *Id.*
111. Prytherch, Lieberthal & Hass, *supra* note 90.
112. Igini, *supra* note 4.

in a relatively short period may not be attainable for a problem whose solution is costly and requires the international commitment of producers, consumers, and municipalities.

The UN Basel Convention took effect in March 1989 with the hopes of addressing "transboundary hazardous waste."[113] Specific plastic scrap and waste amendments govern transboundary movement and require that countries party to the Convention receive "prior written consent of the importing country and any transit countries."[114] This is referred to as the prior notice and consent requirement.[115] It is important to note, however, that the Basel Convention and its amendments allow for the exportation of hazardous waste so long as it is done in an environmentally conscious manner. It does not create a bright line rule declaring what is permissible or "environmentally conscious" for disposing of hazardous plastic waste. While it can be said that the Basel Convention is not the grandiose solution needed for plastic waste, it must not be glossed over or discounted because it fosters international cooperation and accountability. The Basel Convention is a valuable intermediary remedy to stop waste from being haphazardly discarded while more cumulative and enforceable agreements are created.

The United States has signed the convention but has failed to reach ratification because it claims that the Convention's goals are still accomplished domestically.[116] Without ratification, the Convention is a virtue-signaling promise that further enables the principle of American exceptionalism.[117] Ratification by all signing nations is imperative to unify efforts for a global climate issue. "Across the United States, local governments and recycling processors are scrambling to find new markets."[118] Some local governments have banned specific plastics,[119] while others have begun burning their recyclables at waste-to-energy plants.[120] Waste-to-energy plants engage in pyrolysis, which also emits carbon into the atmosphere.[121]

Burning plastics for energy wreaks havoc on air quality[122] and merely redirects the environmental crisis. By reflecting the burden of plastic waste onto waste-producing countries, the import ban has potentially just moved the issue down the line, as burning plastics is happening regardless of geographical location. NIMBYism is a fallacy when the effects

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113. *Overview*, BASEL CONVENTION ON THE CONTROL OF TRANSBOUNDARY MOVEMENTS OF HAZARDOUS WASTES AND THEIR DISPOSAL, https://www.basel.int/TheConvention/Overview/tabid/1271/Default.aspx [https://perma.cc/3HTD-M6RG].

114. *New International Requirements for the Export and Import of Plastic Recyclables and Waste*, EPA (Aug. 26, 2024), https://www.epa.gov/hwgenerators/new-international-requirements-export-and-import-plastic-recyclables-and-waste [https://perma.cc/WW9S-8Y7N].

115. *Id.*

116. *Id.*

117. Adam Volle, *American Exceptionalism*, BRITANNICA, https://www.britannica.com/topic/American-exceptionalism [https://perma.cc/JS2F-Z4EQ].

118. Katz, *supra* note 33.

119. Samantha Jarpe & Addy Bink, *Colorado Joins Growing List of States Banning Plastic Bags*, THE HILL (Nov. 13, 2023), https://thehill.com/changing-america/sustainability/environment/4306232-colorado-joins-growing-list-of-states-banning-plastic-bags [https://perma.cc/AB95-53A7] (explaining that New York, Connecticut, Delaware, Maine, Oregon, Vermont, and New Jersey have all banned single-use plastic bags).

120. James Bruggers, *A New Plant in Indiana Uses a Processed Called 'Pyrolyis' to Recycle Plastic Waste. Critics Say it's Really Just Incineration*, INSIDE CLIMATE NEWS (Sept. 11, 2022), https://insideclimatenews.org/news/11092022/indiana-plant-pyrolysis-plastic-recycling [https://perma.cc/2764-3SK8].

121. Tullo, *supra* note 7.

122. Hogue, *supra* note 78.

of air and land pollution are felt regardless of domestic policy. For example, the Great Pacific Garbage Patch is a large collection of floating plastic waste in international waters that has formed due to inadequate waste management by individual states and actors.[123] The Great Pacific Garbage Patch pollutes an estimated 620,000 square miles of international waters.[124] Despite waste exportation and domestic policy, plastics persist at the detriment of our shared plant. Applying NIMBYism to this crisis is akin to keeping your backyard clean while acid rain pours throughout the neighborhood. The plastic recycling crisis is thus an international issue that warrants an international solution.

The United States only recycles 10% of its plastic waste, while European countries recycle 35–40% of their plastic waste.[125] State legislatures have attempted to compensate for a lack of domestic policy and action on the issue.[126] In a comprehensive study conducted by Vanderbilt University, scholars examined whether state deposit laws causally affected recycling behavior or rather were "reflective of the environmental preferences within the state."[127] They notably concluded that "making recycling laws more stringent consequently increases the rate of recycling of those who reside in the state, but may have a longer-term impact on the recycling efforts of those who later move away."[128] "Financial incentives boost recycling rates, and removal of financial incentives lowers recycling rates"[129] as well. The effects of financial incentives and state recycling laws are promising[130] and reinforce the notion that states are underutilizing legislative powers in plastic recycling.

C. Corporate Response and Green Consumerism

A considerable shortcoming of our recycling system is that sorted recyclables are only purchased when they are profitable.[131] When manufacturers can "commit to sourcing non-virgin materials as inputs to their production. Yet, they will only do so if they find that purchasing material is more cost effective or profitable."[132] Extended Producer Responsibility (EPR) regulations have also been implemented to achieve net-zero waste and a circular economy in European countries.[133] EPR requires that plastic producers organize and

123. *The Great Pacific Garbage Patch*, THE OCEAN CLEANUP, https://theoceancleanup.com/great-pacific-garbage-patch [https://perma.cc/63J4-XFWC].

124. Ivana Kottasová, *The Great Pacific Garbage Patch is Now So Huge and Permanent That a Coastal Ecosystem is Thriving on it, Scientists Say*, CNN (Apr. 18, 2023), https://www.cnn.com/2023/04/17/world/plastic-pollution-ocean-ecosystems-intl-climate/index.html [https://perma.cc/CA4H-9V7W].

125. Christopher Joyce, *U.S. Recycling is Struggling to Figure Out a Future Without China*, NPR (Aug. 20, 2019), https://www.npr.org/2019/08/20/750864036/u-s-recycling-industry-is-struggling-to-figure-out-a-future-without-china [https://perma.cc/2P9V-4WWT].

126. *See generally* W. Kip Viscusi, Joel Huber & Jason Bell, *Quasi-Experimental Evidence on the Impact of State Deposit Laws and Recycling Laws: Household Recycling Following Interstate Moves* (Vand. L. Sch., Working Paper No. 20-07, 2020), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3536613.

127. *Id.* at 1–2.

128. *Id.* at 22.

129. *Id.*

130. *See generally id.* (discussing the effects of recycling and deposit laws).

131. Nathan Kunz, Kieren Mayers & Luk N. Van Wassenhove, *Stakeholder Views on Extended Producer Responsibility and the Circular Economy*, 60 CAL. MGMT. REV. 45, 51 (2018).

132. Blanco, Spanbauer & Stienecker, *supra* note 3.

133. Kunz, Mayers & Van Wassenhove, *supra* note 131, at 47–48.

facilitate the treatment of their plastic waste once their product is discarded by consumers.[134] EPR posits encouraging policy but is in its infantile stages and will require the organization and compliance of international companies to make a lasting difference.[135]

Social pressure from a new generation of consumers has helped push companies to purchase non-virgin recyclables and produce "green products."[136] "Green consumerism is when a consumer demands or chooses products that are less harmful to the environment. It is a social behavior that promotes the use of eco-friendly (or green) products."[137] Younger generations in the United States are more likely to be interested in climate change and have personally tailored their actions in response to the crisis.[138] The generational shift in public opinion is presumably correlated to the rise of green consumerism.[139]

Environmentalists starkly criticize the power of green consumerism and argue that it places too much responsibility on consumers.[140] Green consumerism charges consumers with the burden of "maintaining economic growth while simultaneously, even if contradictorily, bearing the burden of driving the system towards sustainability."[141] Buyers now balance the weight of practical, cost-efficient consumption against morality and sustainability.[142] If the gold standard is a circular economy and sustainable development, then recycling is only part of the job.[143] Consumers must also *buy* recycled goods.[144] Purchasing green products as proposed to a cheaper non-green alternative may require companies to internalize the associated production costs to the consumer choice in the marketplace. Moreover, environmentalists declare that although green consumerism "incorporates environmental considerations, [it] is at best at the periphery of sustainable consumption and provides an illusion of progress which distracts from the urgent structural changes needed to achieve sustainable development."[145] Green consumerism works to promote sustainability but is insufficient to effectuate the requisite level of change needed because taking green goods to the marketplace still involves shipping waste and carbon emissions from transportation.

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134. *Id.* at 46.

135. *Id.* at 52.

136. Cary Funk, *Key Findings: How Americans' Attitudes About Climate Change Differ by Generation, Party and Other Factors*, PEW RSCH. CTR. (May 26, 2021), https://www.pewresearch.org/short-reads/2021/05/26/key-findings-how-americans-attitudes-about-climate-change-differ-by-generation-party-and-other-factors [https://perma.cc/VU24-N2J6].

137. Valere Ossie, *Cultivating Green Consumerism*, UNIV. OF S.F.: OFF. OF SUSTAINABILITY – STUDENT BLOG (Feb. 1, 2022), https://usfblogs.usfca.edu/sustainability/2022/02/01/cultivating-green-consumerism [https://perma.cc/48XH-Q22S]/

138. Funk, *supra* note 136.

139. *Id.*; Ossie, *supra* note 137.

140. *See generally* Lewis Akenji, *Consumer Scapegoatism and Limits to Green Consumerism*, 63 J. CLEANER PROD. 13 (2014).

141. *Id.* at 16.

142. *See generally id.*

143. Joyce, *supra* note 125.

144. *Id.*

145. Akenji, *supra* note 140, at 1.

D. Relocation of Chinese Processors?

Chinese corporations that once processed imported plastic waste are now relocating their business to the United States. Ecomelida and Roy Tech Environ[146] announced that they would be opening processing plants in South Carolina and Alabama.[147] Relocation of processing plants will not only help address the massive displacement of plastic waste in our country, but it will also create jobs and minimize barriers to entry for other plastic processing corporations stateside.[148] Though there is a potential for a new wave of industrialism and green technology, it is important to note that bringing plastic waste processing back to the United States will carry the same environmental consequences China faces.

E. Controversy Surrounding Pyrolysis

Proponents of pyrolysis claim that it offers a grandiose solution for both plastic recycling and energy production.[149] Additionally, some argue that pyrolysis could fill the gaps of mechanical recycling and use its scraps because it can "treat various kinds of plastic waste ranging from packaging waste to more complex materials, like rubber."[150] Second, the use of pyrolysis gas for heating greatly reduces the need for external heating and fossil fuels.[151] Third, and potentially the most valuable factor, is the adaptable scale of processes and freedom to tune the product by varying reactor types.[152] Pyrolysis is economically advantageous because "in most cases, the pyrolysis liquid yield is the main goal of the process, the process can be adapted to optimize the production of wax, monomers, aromatics, or selective chemicals with the use of a suitable catalyst."[153]

Pyrolysis is not the environmental "Hail Mary" it claims to be. Pyrolysis is mostly used to make oil that is to be refined and sold as fuel.[154] Though pyrolysis will indeed decrease plastic waste, it is not an "infinitely renewable resource"[155] and poses environmental issues.[156] This is a notable point that warrants heightened pyrolysis scrutiny because most plants produce oil as opposed to non-virgin plastics.[157] The National Renewable Energy Laboratory (NREL) compared the environmental impacts of pyrolysis-generated fuel to fuel from fossil sources and concluded that pyrolysis generates higher greenhouse gas emissions than fossil fuels.[158] "[T]he data suggests that creating pyrolysis

146. Colin Staub, *Chinese Firms Open Up on Their U.S. Recycling Plans*, PLASTICS RECYCLING UPDATE (Sept. 6, 2019), https://resource-recycling.com/plastics/2018/04/04/chinese-firms-open-up-on-their-u-s-recycling-plans [https://perma.cc/BBJ7-RSXD].

147. Katz, *supra* note 33.

148. Judith Lewis Mernit, *As Plastics Keep Piling Up, Can 'Advanced' Recycling Cut the Waste?*, YALE ENV'T 360 (June 1, 2023), https://e360.yale.edu/features/advanced-plastics-recycling-pyrolysis [https://perma.cc/N84A-SU7G].

149. *See generally* Qureshi et al., *supra* note 80.

150. *Id.* at 3.

151. *Id.*

152. *Id.*

153. *Id.* at 3.

154. Qureshi et al., *supra* note 80, at 3.

155. Mernit, *supra* note 148.

156. *Id.*

157. *Id.*

158. Taylor Uekert et al., *Technical, Economic, and Environmental Comparison of Closed-Loop Recycling Technologies for Common Plastics*, 11 ACS SUSTAINABLE CHEMISTRY & ENG'G 965, 965 (2023).

oil from used plastic, including the energy required to superheat the vessel, is worse for the climate than extracting new crude from the ground."[159]

For domestic recycling practices to successfully transition, public and private actors alike must be able to recoup investments and turn a minimum profit for plastic-to-fuel pyrolysis. First and foremost, sourcing plastic waste as feedstock for pyrolysis presents its challenge as "most companies [engaged in] converting plastic to fuel are unwilling to pay for post-consumer plastic."[160] Post-consumer plastic prices have increased, and consequently, it is difficult for pyrolysis plants to source a continuous profitable supply of plastic feedstock.[161] Plastic-to-fuel conversion profitability is ultimately limited by produced oil prices, feedstock prices, operating costs, and competition with other oil refineries.[162] Second, pyrolysis oil is not yet a standardized product with consistent testing methods.[163] Products and methods vary by batch due to inconsistent plastic feedstock composition.[164] Third, the stability and storage of pyrolysis oil is complicated and requires post-treatment.[165] Finally, the refining process of pyrolysis also has disproportionate impacts on those who live near industrial centers—many victims being low-income or those who are a part of marginalized communities.[166]

Financial barriers are but one hurdle of many in the widespread adoption of pyrolysis. As previously mentioned, a smaller portion of pyrolysis processes produce recycled non-virgin plastics.[167] Like pyrolysis oil, pyrolysis non-virgin plastics have their nuances and complications. "For example, due to safety reasons, there are several requirements imposed by the legislation that prevent the use of recycled plastics in food contact materials and toys, which are among the most common uses for plastic."[168] Global adoption of pyrolysis non-virgin plastics is limited and not immediately feasible due to legislatures and public health regulations.[169]

F. Incentivizing Sustainability

Quasi-experimental data supports the conclusion that "financial incentives boost recycling rates" across households.[170] The good news is that data proves that independent consumers can be successfully financially incentivized to change recycling behaviors.[171]

159. Mernit, *supra* note 148.
160. Cesar Lubongo et al., *Economic Feasibility of Plastic Waste Conversion to Fuel Using Pyrolysis*, 27 SUSTAINABLE CHEMISTRY & PHARMACY, no. 100683, 2022, at 1, 4.
161. *Id.*
162. *Id.* at 2.
163. Qureshi et al., *supra* note 80, at 6.
164. *Id.*
165. *Id.*
166. *Id.*; Lubongo et al., *supra* note 160, at 4.
167. Qureshi et al., *supra* note 80, at 7.
168. *Id.*
169. *Id.*
170. Viscusi, Huber & Bell, *supra* note 126, at 22.
171. *Id.*

The bad news is that aggregated consumer and household action will likely remain grossly insufficient relative to larger business plastic production and recycling.[172]

While tax cuts and grants incentivize private firms to engage in environmentally conscious behavior, it is not a guaranteed solution.[173] Government intervention is necessary to mandate sustainable practices and create accountability.[174] One benefit of government action is that there is guaranteed policy change and accountability for sustainable practices. A con of government action, however, is that it is likely to be perceived as partisan and not pass through the legislature or be fully implemented by municipalities. Corporations would likely oppose government intervention on the issue as they do not want to incur additional operation costs. Distinctively, larger actors, such as corporations, have a considerable seat at the legislative table due to the abundant financial resources to employ lobbyists.[175] Small business interests may also be impeded due to their fragile nature and the potential for mandated sustainability to drive up their operation costs.[176] Bearing in mind the political climate and market economics, public-private partnerships are a potential solution.

IV. RECOMMENDATION

To address the plastic recycling industry and its associated pollution, this Note proposes societal, political, and economic changes toward the United States' environmental sustainability. This Note proposes (1) increased social responsibility via education and marketplace mechanisms, (2) building the reusable economy, and (3) ratification of international treaties.

A. Social Responsibility

Admittedly, plastic consumption is embedded in our society, and changing human behavior is no small task. On a micro level, the government should launch public educational campaigns for adults as well as tailored curriculum for youth in public schools to optimize recycling and minimize excessive waste. Given that many recyclables are contaminated by food waste,[177] education will optimize recycling practices and create a sense of agency in adults as well as newer generations. Education may be as simple as informing people that plastic food containers should be cleaned before being placed in larger waste receptacles.

Individual social responsibility in the marketplace is grossly insufficient as a standalone solution because it overemphasizes the strength of consumer morality in the eyes of

172. Alec Tyson & Brian Kennedy, *Two-Thirds of Americans Think Government Should Do More on Climate*, PEW RSCH. CTR. (June 23, 2020), https://www.pewresearch.org/science/2020/06/23/two-thirds-of-americans-think-government-should-do-more-on-climate/ [https://perma.cc/WR73-JMCP].

173. *Id.*

174. *Id.*

175. Saul Elbein, *Many Corporations Promote 'Net Zero' While Lobbying for Weaker Climate Action: Report*, THE HILL (Nov. 17, 2023), https://thehill.com/policy/energy-environment/4313429-many-corporations-promote-net-zero-while-lobbying-for-weaker-climate-action-report [https://perma.cc/XVN6-PN99]. It was reported that "58[%] of companies had set concrete climate targets that were contradicted by their own lobbying." *Id.*

176. Addisu Lashitew, *Small Business Green Recovery Fund to Power US Climate Transition*, BROOKINGS (Mar. 1, 2021), https://www.brookings.edu/articles/small-business-green-recovery-fund-to-power-us-climate-transition [https://perma.cc/S67W-ASUV].

177. Carriere & Horne, *supra* note 10, at 10046.

cost. While it is principal to changing consumer psychology in a plastic world, relying on social pressure alone reflects the problem on individuals who have considerably less buying power and function in a marketplace already plagued with plastic. Alternatively, aggregate social responsibility is a powerful tool and can be used to apply pressure to corporate entities and governments that are more malleable to public opinion. Consumer pressure against single-use plastics is notably only a method of slowing plastic waste accumulation while businesses and legislators respond to public opinion.

Studies show that public opinion has failed as a sole mechanism for holding companies accountable.[178] People are less likely to identify companies as being responsible for human rights violations if the alleged harm is land contamination, for example.[179] Furthermore, people tend to be more forgiving towards companies when they appear to be doing their due diligence to address the contamination.[180] As applied to the recyclable plastic industry, public opinion does not apply enough pressure on companies for them to change their behavior or overcome the burdensome costs associated with using non-virgin plastics in production.

The perfect scenario and solution to global plastic consumption would be to transition to a circular economy. A circular economy is "an economic system that reuses plastic resources, generating no waste."[181] Green consumerism capitalizes on public outcry and soothes the consciences of consumers through marketing to make them believe they are doing their part. Bottle manufacturer Nalgene has announced that they will produce reusable water bottles now with polyester copier, which is a recycled material.[182] Nalgene is almost guaranteed success in an already saturated market as it can use eco-marketing to appeal to environmentally-conscious consumers. Nalgene advertises its "Sustain Collection" not only as being made from recycled American plastic but also that the bottles are made to be recycled again once they have had their full use.[183] Unfortunately, like many other green products, Nalgene Sustain recycled bottles cost more and are at the mercy of consumer choice and buying power.[184] The traditional plastic Nalgene is $10.99, while the recycled plastic Sustain bottle parallels at $16.99.[185]

Green consumerism is not the solution and ultimately falls short when looking at the consequences of capitalism and long-term sustainability. Production of Nalgene Sustain bottles still requires sourcing of plastic, shipment of materials using fossil fuels, and potentially plastic packaging for safe delivery to storefronts. Non-virgin plastics in new products are still something to celebrate, nonetheless.

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178. *See generally* Matthew Amengual, Rita Mota & Alexander Rustler, *Research: Public Opinion is Not Enough to Hold Companies Accountable*, HARV. BUS. REV. (Sept. 6, 2022), https://hbr.org/2022/09/research-public-opinion-is-not-enough-to-hold-companies-accountable [https://perma.cc/D627-MLHN].

179. *Id.*

180. *Id.*

181. DOMINIC CHARLES & LAURENT KIMMAN, PLASTIC WASTE MAKERS INDEX 2023 8 (2023), https://cdn.minderoo.org/content/uploads/2023/02/04205527/Plastic-Waste-Makers-Index-2023.pdf [https://perma.cc/C9LQ-NCAC].

182. *Long Live the Nalgene Bottle! Understanding the Life Cycle of Recycled Plastic Bottles*, NALGENE, https://nalgene.com/lifecycle-of-recycled-plastic-bottles [https://web.archive.org/web/20240521013421/https://nalgene.com/lifecycle-of-recycled-plastic-bottles/].

183. *Id.*

184. *Id.*

185. *Id.*

B. Building Out the Reusable Economy

Government intervention is necessary for accountability and incentivizing the building of a cleaner, reusable economy. As part of the plastic recycling solution, the federal government should increase green production and decrease, if not eliminate, barriers associated with using non-virgin materials in production. "Investment tax credits at the federal level incentivize business investment. They let businesses deduct a certain percentage of investment costs from their taxes."[186] Providing tax incentives to manufacturers that use non-virgin materials, for example, will address the shortcomings of domestic recycling practices by maximizing material utility, decreasing production costs, and thus decreasing costs to consumers. Minimizing differences in cost between regular and green products will level consumer choice and increase market competition for sustainable practices.

Though tax incentives in the plastics context are still hypothetical, there is strong evidence supporting the efficacy of incentives in other green technologies, such as clean energy and the reduction of carbon emissions.[187] For example, EPIC and Rhodium Group analyzed tax credits that boost clean energy.[188] They measured the costs and benefits of tax incentives and found that the benefits from reduced carbon emissions alone were about four times greater than the costs.[189] Given the broad success of tax credits in green development and managing environmental impact, the United States should expand tax credits to the production of non-virgin plastic goods.

The federal government has power under the Commerce Clause of the U.S. Constitution to regulate goods that flow in interstate commerce.[190] Thus, Congress has the requisite regulatory power to provide federal funds to companies that demonstrate a commitment to non-virgin plastics or plastic alternatives. Though it would be politically difficult to pass through the legislature, the federal government may impose a recycled content minimum on products containing plastic to fill in the gaps in industry response.[191] A recycled content minimum would help to address existing waste only.

To eliminate new plastic production, Congress should implement a ban on new plastics and provide federal funds to companies that opt for biodegradable plastics. It is within Congress's taxing and spending power to regulate instrumentalities of commerce and any action that substantially affects interstate commerce.[192] Specifically, legislation regulating activity is constitutionally permissible so long as the regulated activity is economic, it is part of a larger statutory scheme, or there is a jurisdictional hook.[193]

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186. Foss & Co., *How Tax Credits Can Be Used to Capitalize on the Green Transition*, THOMSON REUTERS (Apr. 24, 2023), https://www.thomsonreuters.com/en-us/posts/esg/tax-credits-green-transition [https://perma.cc/6EQ4-Z6YH].

187. *The Climate Benefits from Clean Energy Tx Credits Are About Four Times the Costs*, ENERGY POL'Y INST. UNIV. CHI. (Feb. 9, 2022), https://epic.uchicago.edu/news/the-climate-benefits-from-clean-energy-tax-credits-are-about-four-times-the-costs [https://perma.cc/6GRP-5Q39].

188. *Id.*

189. *Id.*

190. U.S. CONST. art. I, § 8, cl. 3.

191. Carriere & Horne, *supra* note 10, at 10055.

192. United States v. Morrison, 529 U.S. 598, 607–26 (2000).

193. United States v. Lopez, 514 U.S. 549, 560 (1995); Gonzales v. Raich, 545 U.S. 1, 16 (2005); Nat'l Fed'n of Indep. Bus. v. Sebelius, 567 U.S. 519, 521 (2012).

The proposed grant funding for biodegradable plastics is constitutionally supported because it is innately economic and is part of a larger regulatory scheme to address the plastic recycling crisis and climate change. Federal funding in biodegradable plastic also builds the domestic economy and a new era of industrial opportunity. On an international scale, by investing in biodegradable plastics, the United States has the power to steer innovation and remove associated barriers that are keeping less developed countries dependent on cheaper traditional plastic.

C. International Treaties

An international crisis warrants an international solution. The present Basel Convention serves to control the "transboundary movement of hazardous wastes and their disposal" and has a sub-group known as the Plastic Waste Partnership (PWP).[194] The PWP has recently focused on Extended Producer Responsibility.[195] Though the Basel Convention is an international treaty, it lacks prominent actors and the teeth necessary to mandate change.[196] For example, the United States has signed but not ratified the Basel Convention.[197] Conservative politicians in favor of isolationist politics[198] urge the United States to not ratify the Basel Convention, claiming that its goals can still be enforced through the EPA and Section 3017 of the Resource Conservation and Recovery Act (RCRA).[199] The RCRA permits a private party to be held civilly and criminally liable for a violation of an applicable international agreement.[200] While the United States has preexisting bilateral agreements with Canada and Mexico that give Section 3017 teeth for domestic policy, it dodges the importance of developed Western nations in the Basel Convention.[201] By ratifying the Basel Convention, the United States exhibited leadership while being held personally accountable for its actions.

The United Nations is currently drafting a new plastic treaty and mandated a first draft be proposed by November of 2023.[202] Since the initial draft, the Intergovernmental Negotiating Committee (INC) of the UN Environment Program (UNEP) has completed four of the five treaty negotiating sessions.[203] The fifth negotiation session is scheduled for

194. Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, Mar. 22, 1989, 1673 U.N.T.S. 57, https://treaties.un.org/doc/Publication/MTDSG/Volume%20II/Chapter%20XXVII/XXVII-3.en.pdf.

195. *Plastic Waste Partnership Overview*, BASEL CONVENTION ON THE CONTROL OF TRANSBOUNDARY MOVEMENTS OF HAZARDOUS WASTES AND THEIR DISPOSAL, https://www.basel.int/Implementation/Plasticwaste/PlasticWastePartnership/tabid/8096/Default.aspx [https://perma.cc/X98V-M39S].

196. *See generally* Jeffrey M. Gaba, *Rethinking Recycling*, 38 ENV'T L. 1053, 1082 (2008) (discussing that the United States has signed, but not ratified the Basel Convention).

197. *Id.*

198. Carriere & Horne, *supra* note 10, at 10055.

199. Gaba, *supra* note 196, at 1053–54.

200. *Id.*

201. *New International Requirements for the Export and Import of Plastic Recyclables and Waste*, *supra* note 114 (discussing the United States' separate agreement with Mexico and Canada).

202. Valerie Volvovici, *After Rough Start, UN Plastic Treaty Talks End with Mandate for First Draft*, REUTERS (June 5, 2023), https://www.reuters.com/business/environment/after-rough-start-un-plastic-treaty-talks-end-with-mandate-first-draft-2023-06-02 [https://perma.cc/RG5T-LU82].

203. *Intergovernmental Negotiating Committee on Plastic Pollution*, U.N. ENV'T PROGRAMME, https://www.unep.org/inc-plastic-pollution [https://perma.cc/3FEA-CUMB].

November 25th through December 1st, 2024.[204] The goal of the new treaty is to reduce plastic waste by 80% by 2040.[205] Though the treaty is not officially drafted and published, the United Nations Environment Program has reported that it will focus on creating a circular plastics economy that optimizes the circulation of existing plastic materials.[206] It is worth noting, however, that the treaty will, like the Basel Convention, only be empowered by voluntary country ratification due to the absence of a United Nations enforcement mechanism.[207] Ratification is a separate issue because ratification may cause some countries to take a financial hit. The success of the prospective plastic treaty ultimately hinges on the propensity to respond to an urgent global crisis.

V. CONCLUSION

China's blockade of imported recyclables has left a hole in the global recycling industry and forced developed nations to confront the consequences of a plastic-dependent world. Absent Chinese business, lesser developed nations are taking on the world's plastic, which has proven to be far more detrimental to environmental initiatives. Though plastic dependency is convenient, we never truly escape its waste once it is produced. Plastic waste never fully disappears but rather gets smaller and smaller until its microplastics loom at the seams of our world.[208] Approximately 8.3 billion tons of plastic have been produced, half of which has been produced in the past thirteen years.[209]

Plastic consumption is an international issue with many stakeholders. However, swift change in both policy and practice is crucial to filling the void China left in the industry of imported recyclables. A comprehensive approach, including increased social responsibility, investment in innovation, and the ratification of the Basel Convention, is paramount in attempting to fix the world's broken plastic recycling industry.

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204. *Id.*

205. Valerie Volcovici, *UN Lays Out Blueprint to Reduce Plastic Waste by 80% by 2040*, REUTERS (May 16, 2023), https://www.reuters.com/business/environment/un-lays-out-blueprint-reduce-plastic-waste-80-by-2040-2023-05-16 [https://perma.cc/8YE3-YR3T].

206. *Id.*

207. *International Law*, CORNELL L. SCH.: LEGAL INFO. INST., https://www.law.cornell.edu/wex/international_law [https://perma.cc/J4AZ-T56G].

208. *In Images: Plastic is Forever*, U.N. EXHIBITS, https://www.un.org/en/exhibits/exhibit/in-images-plastic-forever [https://perma.cc/GFU9-MXSL].

209. James Hataway, *UGA Participates in Calculation of Global Plastics Production*, UGA TODAY (Jul. 31, 2017), https://news.uga.edu/scientists-calculate-total-amount-of-plastics-ever-produced [https://perma.cc/8XGN-57R3].