

## Underserved Communities Trashed by Plastic: Slowing the Proliferation of Petroleum Based Products Through Stewardship Laws and Enhanced Back-End Regulatory Solutions

Joan F. Chu

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# UNDERSERVED COMMUNITIES TRASHED BY PLASTIC: SLOWING THE PROLIFERATION OF PETROLEUM-BASED PRODUCTS THROUGH STEWARDSHIP LAWS AND ENHANCED BACK-END REGULATORY SOLUTIONS

Joan F. Chu\*

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## INTRODUCTION

Plastic pollution has attracted a tremendous amount of attention and press coverage in early 2021 as evidenced in news stories; an episode of John Oliver's show, "Last Week Tonight"; and a viral tweet from Greta Thunberg highlighting a study linking plastic pollution to human penises shrinking.<sup>1</sup> These eye-catching pieces stemmed from Dr. Shanna H. Swan's work that culminated in her book, *Count Down: How Our Modern World Is Threatening Sperm Counts, Altering Male and Female Reproductive Development, and Imperiling the Future of the Human Race*.<sup>2</sup> Other articles have highlighted plastic pollution's impact on polar bears, which causes their penis bones to lose density and become vulnerable to fracturing when they attempt to procreate.<sup>3</sup> The severity of plastic pollution has reached a critical tipping point. Plastic pollution is not just changing lifestyles; it is changing humans and nature on a biological level.

The production and consumption of plastic is unsustainable for three reasons. First, the production of plastic is tied to fossil fuels, which are finite resources.<sup>4</sup> Second, the emissions associated with plastic production and disposal contribute significantly to climate change.<sup>5</sup> Third, plastic is unsustainable because it has no good place to go. Even when it can be recycled, which is not necessarily a given, it is often downcycled.<sup>6</sup> This means that plastic recycled today is often turned into a product that cannot be recycled later.<sup>7</sup> It is waste.

The costs of fossil fuel extraction are evident in the large volume of oil and gas exploration and production undertaken nationwide. Production and incineration of plastics emits toxic chemicals into the air. According to a Center for International Environmental Law ("CIEL") report, in 2030, emissions from the plastic lifecycle could hit 1.34 gigatons annually.<sup>8</sup> CIEL notes that emissions-wise that figure equates to roughly 295 new 500-megawatt coal-fired power plants.<sup>9</sup> Even plastics that make it to a recycling center are rarely given a second life. It is estimated that only 2.5% of U.S. plastics are ever recycled.<sup>10</sup> The vast majority of plastic waste either accumulates in landfills or is incinerated, which contributes to increased CO2 emissions, exacerbates climate change and disproportionately impacts communities of color and the underserved.<sup>11</sup>

Recently, however, incinerator production has declined due to economic conditions and issues related to maintaining facilities.<sup>12</sup> If incineration facilities are to be phased out, then the U.S. must determine the best paths forward to address the increased accumulation of plastic waste through the prism of climate justice.<sup>13</sup> Recycling as it is practiced today is not an option.

The plastic industry misled the public when it asserted that products were recyclable.<sup>14</sup> The industry framed plastic pollution as an issue created by *consumers* who did not recycle, and *not by the manufacturers* who continued to produce plastic products that could not or would not be recycled because recycling was impractical or possible only in theory.<sup>15</sup> Nevertheless, plastic products were slapped with the universally recognizable recycling symbol: the triangular, three-arrowed, Mobius strip logo. This is not the first time industry has deliberately misled

the public regarding the hazards of fossil fuel based products.<sup>16</sup> The oil and gas industry was one of the first entities to understand the implications of climate change; however, instead of being part of the solution, they dug their heels in and vigorously opposed policies designed to mitigate environmental harms stemming from climate change and the nation's reliance on fossil fuels.<sup>17</sup> It is unsurprising that the plastic industry is employing a similar tactic.

One possible regulatory response to the plastic waste issue would be comprehensive front-end regulation (*i.e.*, labeling).<sup>18</sup> Even considering past regulatory progress and victories in the courts regarding labeling, altering current consumer behaviors will be challenging when it comes to plastic usage and consumption. Just as tobacco and alcohol products are labeled to reflect health and safety implications, proper labeling of plastics might inform consumers that certain plastics are indeed not recyclable, either because their chemical makeup precludes it or because it is simply too expensive to recycle them.

Consumers should be informed that the plastic products they consume will end up in a landfill or incinerator, as this is material information regarding the purchased product. The problem with a front-end regulatory approach is that it once again places the onus on consumers who are traditionally and historically the ones with the least flexibility and power. Consumers make their own decisions but not under conditions and frameworks of their own choosing. They buy what is readily available, and the resulting waste ultimately is disposed in communities that are already overburdened and underserved.<sup>19</sup>

Back-end regulation is the primary focus of this article. This regulatory strategy requires producers, manufacturers, and/or sellers to take responsibility for the product after the consumer is done with it and its useful life has expired. Back-end regulation can deter manufacturers from producing plastics beyond what the environment can bear. Until plastics production is financially unappealing, it will continue unabated. By holding producers responsible for what they generate, it may be possible to protect the environment and relieve the burden on marginalized populations forced to shoulder the burden of plastic.

The plastics industry is best positioned to minimize the harmful impact that their products have on communities. The major problem the U.S. faces is deciding how best to manage existing plastic waste and doing so in a way that protects vulnerable populations and disincentivizes plastic proliferation. Even if the U.S. ceased all plastic production tomorrow, the nation would still be left holding the proverbial, and likely plastic, bag.

As long as there are no economic incentives for manufacturers to reconsider plastic production, little will change. Plastic waste poses both short-term (*i.e.*, harmful incineration fumes and residual ash) and long-term hazards (*i.e.*, CO2 emissions from incineration and accumulation of plastic trash—both in landfills and on the land/seascape) to low-income communities and underserved communities of color that typically live close to landfills and incinerators.<sup>20</sup> This article addresses how best to manage plastic waste in a way that meets climate justice principles and standards.

Part I of this article discusses the ways plastic waste contributes to climate change and the harm and risk it poses to underserved communities in the U.S. Part II reviews the current legal framework that is in place to address waste management issues. It explores how the Federal government addresses social justice concerns and environmental challenges posed by waste generation through the Resource Conservation and Recovery Act (“RCRA”). Part II also examines how California, Maine, and Maryland are pushing stewardship laws as a way to hold private entities accountable for the waste they generate. Part III explores solutions to the plastic waste problem while incorporating climate justice principles through effective plastic waste management. It recommends adoption of stewardship laws at the state and federal level as valuable tools to address the challenges and harms posed by plastics. Such laws embody core principles of climate justice and ensure that vulnerable populations are not the first to be sacrificed as the nation begins to grapple with the visible and imminent climate crisis.

## I. BACKGROUND: PLASTIC, PLASTIC EVERYWHERE

Climate change is the greatest existential threat to the global community. It is real and it is happening now, yet it is in dispute by some.<sup>21</sup> Theories of a sun-centric solar system and spherical earth were also in dispute at one time, and those world views took centuries to become widely accepted.<sup>22</sup> Yet the world does not have a moment to lose in accepting the reality of climate change. Global temperatures and seas are rising, glaciers and ice caps are melting, flooding and storm events (*i.e.*, hurricanes, tsunamis, tornados) are on the rise both in frequency and intensity.<sup>23</sup> Additionally, the premise that climate change is human-induced has triggered debate between scientists and the ill-informed.<sup>24</sup>

Researchers from both the National Aeronautics and Space Administration (“NASA”) and the National Oceanic and Atmospheric Administration (“NOAA”) have determined that current climate change events are more than 95% likely to be caused by anthropogenic factors.<sup>25</sup> Neither academics nor the petroleum industry questions that climate change is real and largely resulting from the human consumption of fossil fuels. Oil and gas manufacturers knew of the potentially dire environmental consequences in the late 1960s – and even they were worried.<sup>26</sup> By the 1980s, ExxonMobil was actively funding a “climate denial” campaign to keep consumers ignorant, or at least skeptical, of climate change.<sup>27</sup> In the meantime, the world was cooking, and the poorest and most vulnerable were the first into the pot.

### A. CLIMATE CHANGE AND PLASTIC: THE REALITY WE SEE

Plastics play a special role in the climate change crisis. Plastic is cheap, in immediate economic terms. It is virtually impossible to avoid inadvertently purchasing some plastic product when leaving a store. It has become a part of our everyday lives – plastic is ubiquitous.<sup>28</sup> Plastic is obsequious, literally “oily,” and a welcome servant in our modern world. Its convenience and flexibility have made it indispensable – again literally, we cannot get rid of it. However, perhaps the biggest

problem with plastic is that its relationship to climate change is hidden from the consumer.<sup>29</sup> At every stage in its lifecycle, plastics are problematic for the climate.<sup>30</sup> A resolution to the current crisis may be found through a better understanding of where plastics come from, what they do in the environment, and where they end up, because they do not just “go away.”

### I. WHERE PLASTICS COME FROM

Plastics are primarily derived from non-renewable fossil fuels: coal, oil, and especially natural gas.<sup>31</sup> These resources are the result of heat and pressure on organic matter that was deposited in geologic (primarily shale) strata ten perhaps 300 or 400 million years ago.<sup>32</sup> That fossil fuels come from natural plant and animal remains, however, does not make them readily renewable. They are called fossil fuels not just because of their ancient origins but because specific fossilized organisms are found in the sedimentary rock layers with coal, oil, and gas.<sup>33</sup> Before drilling or mining ensues, oil and gas exploration usually entails an analysis of core samples to identify indicator species of fossils confirming that a given site is worthy of resource extraction.<sup>34</sup> The fossil fuel extraction process itself, a precursor to plastic production, uses fossil fuel.<sup>35</sup> In the recovery phase, methane, a potent greenhouse gas, is often released.<sup>36</sup> As such, at its very inception, plastic production exacerbates climate change impacts.<sup>37</sup>

Human-made plastics have been around for nearly two centuries. The earliest plastics were created from plant fibers, specifically cellulose from plant cell walls. The first plastic, nitrocellulose, was the creation of Henri Braconnot (1780–1855).<sup>38</sup> His discovery in 1833 ultimately led to the production of plastic billiard balls as a substitute for scarce ivory.<sup>39</sup> Celluloid, another plant-based plastic, was produced by Alexander Parkes (1813–1890) and exhibited in London in 1862.<sup>40</sup> Plastic discoveries and production exploded shortly thereafter. In 1909, Leo Hendrik Baekeland was first to coin the term “plastics,” and the rest is history.<sup>41</sup>

In chemical composition, plastic is classified as a polymer (from Greek—“many parts”).<sup>42</sup> There are naturally occurring polymers such as rubber latex (a plant exudate typically from the rubber tree), silk fiber (from spiders and silkworms) and cellulose (from plants).<sup>43</sup> Human-contrived polymers have come from reconfigurations of renewable plant fibers (*e.g.*, cellophane and rayon), and from non-renewable fossil fuel sources (plastics).<sup>44</sup> Polymers are repeating molecular units that are linked to create one-dimensional chains, two-dimensional plains, or three-dimensional solids.<sup>45</sup> The backbone of the plastic polymer is carbon with attached hydrogen atoms (*i.e.*, a hydrocarbon), but can also include oxygen, nitrogen, sulfur, chlorine, fluorine, phosphorous, and silicon.<sup>46</sup> Single chain (linear) plastics are categorized as *thermoplastic* and can be readily melted.<sup>47</sup> Two-dimensional plastics are planar and flexible, and can be used as membranes and filters.<sup>48</sup> Three-dimensional plastics are generally hard, brittle synthetics that cannot be melted down and still maintain the integrity of the plastic.<sup>49</sup> These *thermoset* plastics will burn, not melt, and are virtually impossible to recycle.<sup>50</sup>



The molecular structure of plastics is an important characteristic in determining the “recyclability” of the material. Anytime a plastic is reheated or melted for recycling it loses a bit of its original plasticity.<sup>51</sup> Thermoplastics can be recycled, but not indefinitely—unlike glass for instance.<sup>52</sup> Due to this characteristic, each time plastic is recycled it is one step closer to the landfill. Another indicator of recyclability is transparency.<sup>53</sup> Amorphous plastics are single chain polymers that often appear transparent (e.g., a clear plastic soda bottle).<sup>54</sup> These plastics are soft and pliable and can be recycled. Three-dimensional, crystalline plastics are generally hard and opaque (e.g., Bakelite cookware) and not good candidates for recycling.<sup>55</sup>

Whereas in the transportation realm gas and diesel vehicles are making way for greener options, fossil fuel-dependent plastic production is ramping up.<sup>56</sup> This may well be the result of the oil and gas industry not wanting to lose market share; increased plastic production is an industry survival strategy, but at the cost of our survival. Fossil fuels and plastics today as inextricably linked and increased production of the latter will sustain a demand for petroleum.

## 2. WHAT PLASTICS DO

The chemical structure of a plastic largely determines what it can be used for and what it can do. Plastics can be flexible or ridged, clear or opaque, and their utility extends virtually as far as the imagination. The extent to which plastics form crystalline structures, hydrocarbon cross-linkages can make them stronger and more chemically stable and resistant to breaking down in the environment.<sup>57</sup> These features are great for car parts, heart valves, and prosthetic joints for instance, but they are not easily degradable.<sup>58</sup> After their usefulness has expired, they will still be around centuries later.<sup>59</sup>

Over time, plastics break down into smaller plastics. The worst-case scenario is that the plastic waste generated finds its way into the ocean where it can be ingested by wildlife causing serious health and reproduction concerns.<sup>60</sup> Plastic particulate can also make its way into the food system or be released into the air.<sup>61</sup> The best-case scenario is that the plastic waste is dumped in a landfill, where it breaks down into ever smaller pieces of plastic and hopefully does not leach toxic chemicals.<sup>62</sup>

Look on the back of a plastic container and you will likely see a Mobius strip with numbers one through seven in the center. The numbers assigned to plastics correspond to the specific chemical resin from which the plastic is made (i.e., the specific kind of hydrocarbon bond within the plastic).<sup>63</sup> Each number represents a unique resin used to make the plastic. For example, plastic that is labeled as one, Polyethylene Terephthalate, can be used for clothing, carpet fiber, bottles, food container, and molded plastics in general.<sup>64</sup> Environmental concerns aside, Polyethylene Terephthalate has certain characteristics that make it a desirable material. It is clear, tough, heat resistant, impermeable to gas and liquid.<sup>65</sup> Various/mixed plastics that are typically labeled with a seven are used in layered plastic packaging, resins, and nylon.<sup>66</sup> Plastics are in everything from clothing and electrical insulation to surgical tubing and chip bags. It is

embedded into every aspect of life. Given that so much of daily life and consumptive habits are dependent on the services that plastic provides, it is difficult to live without it.

## 3. WHERE PLASTIC GOES

At the end of its life, plastic is classified as municipal solid waste (“MSW”) and the majority of plastic waste goes to landfills.<sup>67</sup> Unlike glass and metal, which are infinitely recyclable, there are only so many times plastic can be recycled before it becomes waste. The U.S. Environmental Protection Agency (“EPA”) estimates that in 2018, approximately thirty-six million tons of plastic-MSW was generated.<sup>68</sup> Of this, just over three million tons were recycled, and six million tons were sent to incinerators for energy generation.<sup>69</sup> The majority of the waste, however, was sent to landfills—a staggering twenty-seven million tons of plastic trash, amounting to “18.5[%] of all MSW landfilled.”<sup>70</sup>

The plastic waste that is incinerated or disposed of through combustion is also problematic. Given that plastic production is on the rise, as landfills fill up, more plastic waste could head to incinerators, however it is unlikely that incinerators will be the prime candidate to handle plastics waste.<sup>71</sup> These facilities emit greenhouse gases, which only exacerbates climate change and poses waste management issues especially to at-risk communities. *Where* plastic waste goes really matters, especially in terms of climate justice. Because both incinerators and landfills are located disproportionately near communities of color, these neighborhoods bear the brunt of the harmful effects of toxic emissions and runaway landfill leachate.<sup>72</sup> Fortunately, the practice of incinerating plastics as a means to address plastic waste generation is becoming less accepted in the U.S. and incineration operations are closing.<sup>73</sup> Therefore, it is even more necessary to examine how landfills are going to manage and maintain the plastic waste being diverted to their facilities.

Today’s landfills are constructed to mitigate a number of potential harms to the environment.<sup>74</sup> Landfills are engineered to protect groundwater and soil and reduce the impact of landfill air emissions.<sup>75</sup> While great strides have been taken to improve waste management and landfill construction, the simple truth remains — landfills leak.<sup>76</sup> And although both federal and state governments have rules and regulations on landfill management, oversight is lacking and the idea of a truly safe landfill is a legal fiction at best, if not a myth at worst.<sup>77</sup> This is not to demonize the worthy pursuit of creating safer landfills; it is only to highlight that reliance on the idea that humans can trust landfills to take care of the waste is misguided.

At the end of their lifecycle, plastics that are properly disposed of will still end up in a landfill because only a tiny percent of plastic can be recycled on a never-ending loop. Once there, the plastic waste accumulates, and the surrounding community must rely on proper landfill management to protect it from leachate. However, as the Conservation Law Foundation noted, even the EPA acknowledges that “No liner... can keep all liquids out of the ground for all time. Eventually liners will either degrade, tear, or crack and will allow liquid to migrate out of the

unit,” – and not just any liquid mind you, but *toxic* effluent.<sup>78</sup> Contaminants from plastic include phthalates, polychlorinated biphenyls (PCB), polycyclic aromatic hydrocarbons (PAH), organochlorine pesticides (OCP), Polybrominated diphenyl ethers (PBDE), Alkylphenols, Bisphenol A (BPA), and Metals (*i.e.* Cadmium, Zinc, Aluminum).<sup>79</sup> These toxins are associated with endocrine/fertility disruption, physiologic malformation, allergies/asthma, neural disruption, and immune system impairment, and some are carcinogens.<sup>80</sup> While plastic provides convenience with regards to day-to-day activities, as it breaks down, plastics pose a serious long-term threat to the environment and to human and non-human animals.<sup>81</sup>

## B. CLIMATE JUSTICE AND PLASTIC: THE REALITY WE WANT

The plastic products Americans buy, use, and throw away must go somewhere. That “somewhere” matters because risk is not equally distributed within society. Landfills are often placed in low-income areas, and communities of color.<sup>82</sup> Foisting complex waste management decisions on communities already overburdened and underserved is precisely the kind of issue that climate corrective justice is designed to address.<sup>83</sup> Numerous articles have cited the disproportionate impact current waste management practices have on underserved communities.<sup>84</sup> Since the 1970s, the nation has known that communities of color were more likely to have landfills and other undesirable fixtures in their community.<sup>85</sup>

To individuals not living near landfills, it may not sound like an overly burdensome fixture; however, given that incineration is disfavored, landfills will likely see an increase in plastics being diverted to them forcing marginalized communities to shoulder the burden at a greater rate. An EPA report on municipal solid waste found that waste generation had increased from 8.2% in 1990 to 12.2% in 2018.<sup>86</sup> It is no wonder that states are becoming concerned with the prospect of landfills filling up, and that they are struggling to find alternatives to MSW management.<sup>87</sup> Communities that host landfills will be buried in plastics if nothing is done to curb the nation’s plastic addiction.

Concerns about running out of space at landfills are not the only concerns for these communities when considering the harms that an increase in plastic waste poses.<sup>88</sup> Plastics sitting in landfills create health risks to the surrounding communities.<sup>89</sup> Leachate from MSW facilities may contaminate groundwater and soil and plastics can exacerbate the potential harm.<sup>90</sup> Plastic is derived from non-renewable fossil fuels and the chemicals used to produce plastic are hazardous.<sup>91</sup> A study published in 2011 found that the chemicals used in plastic production “may be released during the production, use and disposal of the plastic product.”<sup>92</sup> Additionally, an article in *Nature* found that “many plastics may be chemically harmful in some contexts — either because they are themselves potentially toxic or because they absorb other pollutants.”<sup>93</sup> Essentially, plastics may interact with other harmful waste in the landfill and should there be a breach, serious environmental harm would ensue. Plastic polymers may break down into

monomers, which can be carcinogens.<sup>94</sup> Moreover, there are myriad non-plastic related environmental and climate problems from landfills, such as nuisance odors and emission of greenhouse gases from decomposing organic matter.<sup>95</sup>

Environmental racism has become so pervasive that the United Nations (UN) has singled out the United States in a recent report highlighting the horrendous environmental racism in Louisiana’s “Cancer Alley,” so called because it is home to “nearly 150 oil refineries, plastics plants and chemical facilities.”<sup>96</sup> While the focus of this article is not on plastic plants and their significant impact on climate change and vulnerable communities, underserved communities are being harmed on both the front end and back end of the plastic lifecycle. This reality underscores that environmental injustice and exposure to environmental hazards is a serious and ongoing problem that will not go away on its own, much like plastics.

Climate justice, which falls within the broader environmental justice movement, is a call to action.<sup>97</sup> It is that demand, not for passive acquiescence of the *status quo*, but for an active pursuit of fairness, that must animate and inform the goal of the climate justice movement. The environmental justice framework can be viewed from four aspects: distributive justice, procedural justice, corrective justice, and social justice.<sup>98</sup> While environmental justice is a difficult concept to define, it can generally be understood as a results-based premise, with a normative equitable end state.<sup>99</sup> It is from this fundamental understanding that climate justice can be considered in light of each of the aforementioned aspects.

Distributive justice can be understood as equal treatment.<sup>100</sup> Equal treatment in this context is not a race to the bottom (*e.g.*, “*My community is forced to live next to toxic waste facility so your community should have to be home to one, too.*”), rather it is about equal protection and the sharing of benefits and reducing overall risk for all.<sup>101</sup>

Procedural justice, as the name suggests, relates to the procedures used when making decisions.<sup>102</sup> Lack of meaningful stakeholder engagement in the decision-making process means that concerns and interests of certain populations may go unaddressed leading to inequitable and unfair outcomes.

Corrective justice focuses on “fairness in punishment and remedying harm inflicted on individuals and communities.”<sup>103</sup> Ensuring that the parties responsible for the harm inflicted are correctly identified and held to account is key to the climate justice framework.

Lastly, social justice can be understood as an umbrella term encompassing elements of racial, economic, and social concerns channeled through the lens of environmental and climate issues.<sup>104</sup> Initiatives such as The Green New Deal are examples of how environmental issues cannot be fully addressed without acknowledging the other frameworks and systems society operates within (*i.e.*, economic profit driven systems, institutional racism, and sexism within government).<sup>105</sup> These concepts will be explored further in Part II of this article as they are woven into the management of plastic waste at the state level through stewardship laws.

## II. LEGAL FRAMEWORK: OMNIPRESENT GARBAGE

When thinking about how best to ameliorate the risks and harms associated with plastic waste, it is important to examine existing regulatory frameworks. Identifying gaps in these frameworks is essential to avoid regulatory redundancies and promote effective problem solving. This section addresses the current state of waste management regulation at the federal and state levels and examine emerging trends in waste management to equitably manage plastic waste by holding producers responsible for the waste they manufactured.

### A. FEDERAL REGULATION OF MUNICIPAL SOLID WASTE: RCRA

For decades, the Federal Government has been acutely aware of the concerns MSW poses to the nation. In 1976, the Resource Conservation and Recovery Act (RCRA)<sup>106</sup> was enacted.<sup>107</sup> RCRA is the primary federal statute that governs solid waste management.<sup>108</sup> RCRA has been amended three times since its inception.<sup>109</sup> The underlying issue RCRA was designed to address is the “growing volume of municipal and industrial waste.”<sup>110</sup>

RCRA was created to regulate solid and hazardous waste in response to congressional findings that the continuing production of “packaging, and marketing of consumer products” resulted in rapidly increasing waste generation, and that as a result of changing methods of manufacturing, the characteristics of waste being generated have also changed.<sup>111</sup> Interestingly, Congress also noted that the “economic and population growth of our Nation” have led to an increase in demand for goods resulting in “a rising tide of scrap, discarded, and waste materials.”<sup>112</sup> Most importantly, for the purposes of this article, Congress found that the above findings would pose “serious financial, management, intergovernmental, and technical problems in the disposal of solid wastes resulting from the industrial, commercial, domestic, and other activities carried on in such areas.”<sup>113</sup> Congress also found that “the problems of waste disposal...have become a matter national in scope and in concern and necessitate Federal action . . . .”<sup>114</sup>

Congress was clear in articulating its findings and concern regarding the hazards of increasing waste generation. Notably, RCRA contains a component that is designed to prevent “future environmental problems...caused by waste.”<sup>115</sup> The EPA, the agency tasked with implementing and enforcing RCRA, noted that RCRA, as applied today,

... has largely focused on building the ... municipal solid waste programs, and fostering a strong societal commitment to recycling and pollution prevention. Ensuring responsible waste management practices is a far-reaching and challenging task that engages EPA headquarters, regions, state agencies, tribes and local governments, as well as everyone who generates waste.<sup>116</sup>

Given this commitment to waste prevention and management, it is necessary to examine how RCRA and the EPA’s regulations make good on achieving these ends.

Section 6901 explicitly acknowledges that land is “too valuable a national resource to be needlessly polluted by discarded materials...”<sup>117</sup> Section 6901(b)(8) provides that “alternatives to existing methods of land disposal must be developed since many of the cities in the United States will be running out of suitable solid waste disposal sites within five years unless immediate action is taken.”<sup>118</sup>

This language reveals that Congress possessed at least a basic understanding that landfills will reach capacity at the current rate of consumption, and action must be taken to ensure that the nation, particularly those that live in closer proximity to landfills, are not living in refuse. What is needed is a prevention strategy, rather than mere risk mitigation efforts. Increasing the number of landfills is not a strategy for prevention, which is a goal that EPA explicitly declares RCRA to be created to achieve.<sup>119</sup> The solution to pollution is not dilution, so too here, the solution to plastic municipal solid waste is not redirecting it to newly created landfills. That only creates another possible vector for contamination of groundwater, soil, and release to the air. That is not a management strategy, but it is more akin to an antiquated practice that serves neither the environment, the American taxpayer, nor most urgently, marginalized groups. Creating more landfills just creates more sacrifice zones.<sup>120</sup>

EPA has been a proponent of addressing environmental justice issues through waste management.<sup>121</sup> In 2010, *Inside EPA Weekly Report* released a piece highlighting Mathy Stanislaus, then head of EPA’s Office of Solid Waste & Emergency Response, and his statements on waste management and the need to address environmental justice issues, of which climate justice is a subset.<sup>122</sup> In remarks delivered at a symposium, “Strengthening Environmental Justice Research and Decision Making,” Stanislaus stated that “the real problem that emerged from the environmental justice movement is, how do you make the decision to prevent harm, even in the absence of conclusive evidence? I challenge you all, in your deliberations, to consider how to operationalize the precautionary principle.”<sup>123</sup> Stanislaus told *Inside EPA*, in a brief interview after his remarks, that the agency has not determined how it might take the precautionary principle<sup>124</sup> and craft it into an official policy, but rather, he was imploring the gathered stakeholders to offer ideas for how to operationalize the concept of preventative regulation.<sup>125</sup> “Obviously, it’s an open question,” Stanislaus said.<sup>126</sup>

### B. STATE STEWARDSHIP LAWS

While EPA may not have fully operationalized principles of environmental and climate justice, Stanislaus’ instincts that stakeholders would brainstorm solutions was not far off. Many states have adopted Extended Producer Responsibility (“EPR”) laws (also known as Stewardship Laws) that serve responsible waste management ends while incorporating principles of climate justice.<sup>127</sup> EPR laws will be explored in more detail in this section.

In thinking about how to develop a more effective federal waste management regulatory framework, states are proving to be a good guide. Many states have stewardship/ EPR laws



to help address the pressing matter of waste management.<sup>128</sup> A notable feature of stewardship laws is the emphasis on placing responsibility squarely at the feet of industry.<sup>129</sup> Manufacturers are responsible for demonstrating that they have the capability and means to manage the end-of-life phase of the products they introduce into the stream of commerce.<sup>130</sup> While at least nineteen states have some form of stewardship laws in place, this section will examine stewardship laws from three states: (1) California's carpet and mattress reclamation laws, (2) Maine's paint stewardship law, and (3) Maryland's ongoing efforts to establish stewardship laws.<sup>131</sup>

California is arguably at the forefront of climate change policy and law, making the state a prime example of how the cradle-to-grave philosophy can be operationalized to incorporate climate justice principles, namely distributive, corrective, and social justice. California's Public Resource Code ("PRC") addresses product stewardship for carpets.<sup>132</sup> The purpose of stewardship laws "is to increase the postconsumer waste that is diverted from landfills."<sup>133</sup> The carpet stewardship laws establish that a Memorandum of Understanding ("MOU") be developed for carpet stewardship.<sup>134</sup> The MOU is to be negotiated by the carpet industry, state government, and other stakeholders.<sup>135</sup> Most importantly, a stewardship plan must be developed by the carpet industry within California detailing how the industry will help divert waste away from landfills.<sup>136</sup> If it meets state-designated targets and goals, then it is approved.<sup>137</sup>

Chapter 21 of the PRC, "Used Mattress Recovery and Recycling Act," is another mechanism by which California is holding manufacturers accountable for the products they put into the market.<sup>138</sup> Like the carpet product stewardship laws, the Used Mattress Recovery and Recycling Act requires producers to create a recovery plan to take back mattresses. The program is to be financed by the producers.<sup>139</sup> Consumers will not incur added charges for having mattresses recovered by the manufacturers, although presumably that cost would be internalized through the upfront cost of the mattress.<sup>140</sup>

It may be a stretch to say that carpet and mattress waste is comparable to plastic waste. Plastic is much more persistent problem due to its omnipresence; however, the underlying motivations behind the carpet stewardship law is transferable to plastics. While carpet may pose a concern to landfills in terms of bulk and heft, plastics are arguably even more concerning because of the sheer volume of waste. One plastic Coke bottle may seem like nothing but think of it in terms of its ubiquity. It is virtually impossible to go into a store and not leave without a plastic product. Stewardship laws aimed at plastics are a means to help landfill management cope with the overwhelming volume of plastic waste.

Like California, Maine also has taken steps to address municipal solid waste management challenges by adopting stewardship laws of its own. M.R.S. Title 38, Ch. 24, Subch. 3

relates to waste reduction and recycling.<sup>141</sup> Specifically, section 2144 establishes a stewardship program for architectural paint.<sup>142</sup> The paint stewardship program operates in a similar fashion to the California laws. Paint producers must create and

submit management programs to the state showing that they are able to care for their products at the end-of-life stage.<sup>143</sup> These stewardship plans must include a "description of how the program will collect, transport, recycle and process post-consumer paint from entities covered by the program for end-of-life management..."<sup>144</sup>

In Maryland in 2014, then-Governor Martin O'Malley and Lieutenant Governor Anthony Brown, released a "Zero Waste Maryland" draft plan report in an effort to divert waste from landfills.<sup>145</sup> The purpose of Zero Waste Maryland was to virtually eliminate waste sent to landfills and incinerators.<sup>146</sup> Additionally, the initiative declared that "[p]roducts that cannot be redesigned or recycled should be replaced with alternatives."<sup>147</sup> According to the report, in 2012 "more than 12.3 million tons of solid waste and 211 billion gallons of municipal wastewater" was generated in the state.<sup>148</sup> Only 45.4% of that waste, which was mostly comprised of municipal solid waste, was recycled in 2012.<sup>149</sup> Out of an abundance of concern regarding landfill capacity, the state was poised to set an ambitious goal of going essentially waste free by 2040.<sup>150</sup> However, by 2017, the plan died in committee and even a modest proposal in the Maryland legislature to adopt a mattress recycling bill was defeated in 2019.<sup>151</sup>

While Maryland lags behind states like California and Maine with regard to waste management, the push for stewardship laws in the state is far from over. In 2021, MD HB36 was introduced.<sup>152</sup> The proposed bill eventually died in committee but would have required producers

... of certain packaging, containers, and paper products to individually or as part of a stewardship organization [to] submit a covered materials and products stewardship plan to the Department of the Environment for approval; prohibiting, on or after a October 1, 2024, a producer of covered materials and products from selling or distributing covered materials and products unless the producer individually or as part of a stewardship organization has an approved stewardship plan.<sup>153</sup>

Although HB36 never became law, such initiatives are an encouraging sign that states are willing to take on plastic waste through comprehensive back-end regulation.

States are leading the charge when it comes to combating the troubling realities of waste generation, as evidenced by the momentum and support behind stewardship laws. From a historical standpoint, it makes sense that states are driving change and reshaping waste management since they have historically been the entity managing solid waste.<sup>154</sup> Even RCRA's congressional findings declared that "the collection and disposal of solid wastes should continue to be primarily the function of State, regional, and local agencies."<sup>155</sup> It follows that when the time comes for increased Federal regulation of plastic waste, Congress and the EPA will have no shortage of stewardship laws on which to model future statutes and regulations.



### III. PROPOSALS AND RECOMMENDATIONS: FLIP THE SCRIPT

Plastic waste in the U.S. has long been framed as a problem created by the consumer and that narrative has proven most convenient for the plastics industry. It is now time to flip the script and shift the focus to the sellers, not the buyers. To that end there are three ways that the government and citizens can tackle plastic waste while advancing the principles of climate justice.

#### A. FEDERAL REGULATION

The far-reaching impacts of plastic generation necessitates federal regulation. States are beginning to take the issue of waste management more seriously and it is only a matter of time before pressure is applied to the federal government to take steps to create a cohesive waste management framework. The solution to waste management cannot be to make more landfills. Land is a precious resource that provides a multitude of services: agricultural (food/ livestock/ textile production), wildlife habitat, and flooding/ desertification mitigation. Vegetated land also serves as a carbon sink to help sequester greenhouse gases from the atmosphere.<sup>156</sup>

State stewardship laws are a crucial step towards holding manufacturers responsible for the waste they produce; however, state legislation creates a patchwork when what is needed is a uniform approach. State and local governments are dealing with waste management issues that are becoming increasingly complex. There is a significant role for the federal government to play in regulating plastic waste to address and minimize adverse consequences of plastic waste generation. That said, state action in the form of stewardship laws can complement federal regulation. Stewardship laws are needed at the federal level to prevent the plastics industry from pivoting away from the problem and leaving the public to pick up the plastic bottles in their wake.

Currently, the plastics industry appears to be trying to operate in a manner to avoid regulation while still promoting the use of their products. Now that the industry has been caught in the recycling lie, they are going on a charm offensive and signaling that they are taking steps to change, thereby greenwashing a profoundly serious environmental issue. Perhaps as a preemptive move against government regulation, Coca-Cola has recently developed a recyclable paper bottle product.<sup>157</sup> Additionally, the American Beverage Association—comprised of the Coca-Cola Company, Keurig Dr Pepper, and PepsiCo—have launched the “Every Bottle Back” campaign, which is supposedly targeted at creating 100% recyclable plastics.<sup>158</sup> The problem here is that it is still fundamentally unsustainable. Even if the plastic can be recycled, it will be a lower quality plastic on second use and wind up in the landfill. The end point remains the same. It goes into the ground, or worse into other parts of the environment. The steps being taken by industry reek of rebranding and lip service to environmental and climate change concerns. Recyclable plastic is still plastic, and therefore, unsustainable and requiring effective waste management. Given that the industry has deliberately misled the public before, it tests the bounds of reason

to blindly trust the private sector to self-correct, which is why Federal stewardship laws are needed.

The Federal government is well aware of the burdens waste management places on states and localities, as evidenced by the congressional findings in RCRA.<sup>159</sup> Stewardship laws are a reasonable way to reduce the burden on communities that are struggling to take in more and more plastic waste. The Federal Government should require industry to take back and manage their plastic waste. This response would shift costs to the parties who are responsible for the waste and who are best able to bear the financial burdens associated with that waste. This approach parallels the effort underway in the courts in which states, counties, and cities are suing the fossil fuel industry to contribute their fair share of the costs that these governmental entities face in their climate adaptation efforts.<sup>160</sup>

Additionally, petitioning agencies tasked with waste management regulation, such as the EPA or state environmental protection entities, can also help create interim solutions while legislation is drafted. Agencies frequently issue guidance documents (interpretive rules) that do not have the full force of law but can serve to guide industry and the public toward adopting certain practices and altering behavior.<sup>161</sup> Guidance is also a helpful way to put the public on notice that the agency will likely be adopting new regulations in the future.<sup>162</sup> Agencies could encourage industry to the extent possible to reclaim the waste they produce as a “best practices” recommendation.

Agencies could also recommend that the plastic industry consider packaging alternatives that have a less environmentally harmful impact on people and wildlife. The guidance itself would not solve plastic environmental justice issues, but it would serve as a stop-gap measure to smooth the transition from what the current industry practices are today and a future where industry must collect and maintain their plastic waste to shield marginalized and vulnerable populations from the hazards of plastic waste.

Another way the federal government may adopt stewardship laws for plastic waste is through the recently proposed plastics treaty. The United Nations has signaled that a plastic pollution treaty is possible, and Secretary of State Antony Blinken has announced that the U.S. will support the treaty.<sup>163</sup> In the event the U.S. becomes a party to a treaty targeted at plastic waste, such an agreement would likely prompt Congress to draft legislation which could potentially include provisions requiring stewardship laws. While international law may not be the ideal vehicle to get plastic stewardship laws, because there is no real enforcement mechanism to ensure compliance, such an agreement could put social and political pressure on the U.S. to honor its commitments and move to address the nation's problematic relationship with plastic.

#### B. LITIGATION AS A VEHICLE TO REGULATION

One vehicle for adopting stewardship laws is litigation. The threat of litigation may be a highly effective short-term tool in pursuing environmental justice.<sup>164</sup> The environmental group, Earth Island Institute, recently filed a suit against major bottle

producers such as Coca-Cola, Pepsi, and Nestle.<sup>165</sup> The suit claims public nuisance and breach of warranty, as well as claims of negligence.<sup>166</sup> This is ongoing litigation, but it can potentially pave the way for similar suits that spur governmental action to adopt comprehensive waste management laws. However, the Earth Island suit seeks to hold only top polluters accountable for their market share of plastic pollution.<sup>167</sup> While this is a tremendous step in advancing climate justice and waste management issues, the issue demands that the entire plastic industry be held accountable. Therefore, legislative action is still needed to incentivize industry through sticks, carrots, or both to goad them to do the right thing.

Back-end regulation provides the proper incentive structure to drive changes in behavior on the part of industry. Unless and until manufactures are held responsible for their waste, waste that Americans believe is manageable through recycling, vulnerable populations will be forced to internalize the risks associated with plastic production both in the short-term and long-term.

Barring an outright ban on plastics, adopting a lifecycle position that focuses on the back end of plastic is the best way to hold the plastic industry responsible for the problem it has created. To that end, plastic producers must be held responsible for the plastic waste generated by their industry. The costs and logistics of plastic disposal and recycling should be borne by plastic manufacturers, not consumers and municipalities. Forcing underserved and under privileged communities to internalize all the risks associated with plastic waste management and disposable while industry ramps up production in the U.S. is causing sustained damage to the environment, public health, and the economy. By implementing back-end regulatory approaches, government can make it economically impractical for industry to produce at its current rate. If industry is compelled to take back its plastic waste, that cost will likely be passed on to the consumer and some industries may be priced out of the market. Alternatively, industry may be forced to reconsider the types of plastics it is willing to manufacture if they are required to take back their waste.

### C. JUST SAY NO – EXPLAIN, COMPLAIN, CAMPAIGN

A largely overlooked, conspicuously absent aspect of scholarly analysis is asking: what can individuals do to help address plastic waste? Self-empowerment is critical to making change.

While most individuals likely want to be part of the climate change solution, not all are equally situated financially or socially. It is true that the onus must fall on those in positions of power and most responsible for the environmental damage done (*i.e.*, industries like oil and gas and plastic producers). That said, industry is driven by what consumers are willing to tolerate, so it is essential that consumers complain. Share your frustration and concern with friends, neighbors, family, and the broader community. Create discomfort with our current societal consumptive practices and advocate for non-petroleum-based options in the marketplace. It is only when we feel uncomfortable and uneasy that the status quo shifts. Creating even the smallest movement in the demand for plastic will help, whether it is on an individual,

household, or community level. Organize strikes and protests to pressure the government to adopt stricter regulations on industry to slow the proliferation of plastics. Greta Thunberg's strike for climate change movement has stoked climate change awareness worldwide.<sup>168</sup>

Complaining can take the form of lawsuits as mentioned above. The planet sustains irreparable harm from emissions and waste generation.<sup>169</sup> Marginalized populations bear the brunt of this harm now, but all will eventually face the consequences of a world that has failed to move away from fossil fuels. The oil and gas industry, as well as the plastic industry, have acted out of self-interest and have gone unchecked. Filing lawsuits can be an effective tool for self-empowerment.

It could also mean writing elected representatives and advocating for stewardship laws in the state or expanding on existing stewardship laws. This plastics management issue is getting increased attention, and now is the time to capitalize on the momentum by raising awareness. The legislative process does not happen in a vacuum, and what citizens do now matters a great deal in achieving an equitable and sustainable future. In seeking to secure that future, those committed to reducing the amount of plastic in the world can look to other climate conscious parties such as the animal law and food law movements that are focused on demand reduction as a means to achieve mission success.<sup>170</sup>

While not the most impactful strategy, forcing a reduction in demand for plastic can be achieved on an individual level by altering consumptive behaviors and educating communities.<sup>171</sup> The only way to truly lose one's voice is by letting industry tell individuals that their actions are meaningless, thereby disempowering and disincentivizing individuals to make positive change. The more effective method for long-term systemic change is to directly petition government, at every level (local, state, and Federal), to adopt policies such as stewardship laws that will slow plastic production, drive up prices, and create the proper economic incentives to move away from petroleum-based products. Not everyone can vote with their wallet so mounting a pressure campaign on legislative bodies is preferred.

Additionally, attending local environmental board meetings can be an effective way to secure changes at the grassroots level. Massive plastic waste is accumulating in landfills and raising concerns over capacity. Framing stewardship laws as an effective and impactful way to reduce plastic waste burdens on municipalities and landfills will broaden the base of support in favor of stewardship laws. Because waste management has historically been the purview of local government, it is likely that local environmental boards have considered the issues at hand. Encouraging local governments to adopt stewardship policies may prompt other localities and states to follow suit.

Individuals can create change at home by making radical demands of themselves, their governments, and the offending industries. This can mean choosing not to buy unnecessary plastic products by opting for a shampoo bar over the plastic container or using toothbrushes, floss, and razors that are plastic free. By advocating for individuals, not industry, and raising awareness

within community networks and government, the demand for plastic can be reduced and pave the way for a plastic-free future while ensuring that the burdens of waste management are placed on the plastics industry.

## CONCLUSION

Plastic production is unsustainable. In the time it has taken to research and write this article, devastating heatwaves have hit the pacific northwest, billions of sea creatures have died, and the ocean caught on fire due to oil and gas operations.<sup>172</sup> Tropical storm Elsa broke a record this year when it became the fifth named storm of the 2021 hurricane season.<sup>173</sup> Typically, a fifth named storm would occur in late August.<sup>174</sup> Fires are consuming the pacific northwest and fire season continues to extend later into the year.<sup>175</sup> The remnants of Hurricane Ida caused deadly flooding in New York and New Jersey hundreds of miles away from where it made landfall.<sup>176</sup> Climate change is happening now and it will continue to get worse so long as nations cling to fossil fuels. The Washington Post reported that close to one in three Americans experience a weather related disaster this summer.<sup>177</sup>

Plastic production is a major driver of greenhouse gas emissions, and there must be a ban on non-essential plastic, and it must happen soon.<sup>178</sup> In the meantime, even if plastic production stops tomorrow, it is crucial that the plastic that is already out in the market is responsibly managed. Low-income and minority populations cannot be asked to shoulder the burden of a problem they did not create and from which they have never benefitted. The plastic industry must be tied to the waste they are responsible for generating through the adoption of federal stewardship laws. Whether a federal stewardship law comes about directly from petitioning Congress, going to court, or activism at the community level, it is clear that nothing will happen unless the public makes their concern and dissatisfaction known.

Climate change is an imminent threat to our health, as is evidenced by the recent onslaught of lawsuits designed to hold the fossil fuel industry accountable for the catastrophic harm exploration and production of oil and gas has had on the environment and human and non-human entities. The U.S. must transition away from plastic like other fossil fuel-based products, but it must be done in an equitable fashion that allows for a transition period.

Plastics are inherently unsustainable and a fundamentally dangerous waste product that not only contributes to climate change but disproportionately hurts marginalized groups within the U.S.<sup>179</sup> Better waste management practices must be adopted, but a first step might be to begin weaning ourselves from our addiction to plastic. The goal is to reduce and eventually eliminate plastic dependency; however, the inertia behind decades of plastic use and waste generation will incur administrative costs for the end-of-life management of plastic. By holding responsible parties accountable for the waste they create, the nation can shift responsibility to the entity best suited to handle the problem (*i.e.*, the plastics manufacturers). Getting a handle on waste management means government will not only be shielding historically discounted and politically marginalized communities, it will also be a step toward securing an environmentally just future where the health, safety, and environmental well-being of all communities are worthy of protection.

Implementation of stewardship laws at the federal level would have numerous benefits, including reducing emissions from incineration, slowing landfills from reaching capacity, creating a market for stewardship planning positions within industries (*i.e.*, creating long term green jobs), and protecting the environment from the need to create more landfills to take waste (not to mention saving the taxpayer and government the financial burden of financing and managing more MSW sites).

Waste management is a multifaceted and ongoing challenge. It will require significant planning, stakeholder involvement, and building trusted relationships between government and industry, but it is possible. Stewardship laws are not just an environmental imperative; they are a moral imperative. It is a duty the nation owes to future generations, shielding them from waste management burdens that they were not responsible for but will inevitably be forced to address. By creating regulations that require plastic producers to take back and be responsible for managing the waste they create, law makers would be protecting the most vulnerable communities in the country. If the plastics industry were responsible for taking back their waste, it might discourage them from producing more since it would be an added expense; furthermore, recycled low quality plastic is not a highly desirable commodity. Without the teeth of comprehensive federal legal frameworks, industry alone cannot be trusted to reclaim their harmful products.



## ENDNOTES

<sup>1</sup> Jaishree Kumar, *Pollution is Shrinking Human Penises, Warns Scientist*, VICE, (Mar. 22, 2021), <https://www.vice.com/en/article/g5b4bq/pollution-shrinking-human-penis-sperm-count-fertility>; John Oliver, *Plastics*, LAST WEEK TONIGHT WITH JOHN OLIVER – HBO, (Mar. 22, 2021), <https://www.youtube.com/watch?v=Fiu9GSOmt8E>; Rachel Koning Beals, *Greta Thunberg Joke-Tweets That Worry Over Smaller Penises Will Finally Get More People to Join Climate Movement*, MSN-MICROSOFT NEWS/MONEY/MARKETWATCH, (Mar. 26, 2021), <https://www.msn.com/en-us/money/other/greta-thunberg-joke-tweets-that-worry-over-smaller-penises-will-finally-get-more-people-to-join-climate-movement/ar-BBleY6Pg?li=BBnbfcl>.

<sup>2</sup> See generally Shanna Swan, *Count Down: How Our Modern World Is Threatening Sperm Counts, Altering Male and Female Reproductive Development, and Imperiling the Future of the Human Race*, (2021).

<sup>3</sup> Luke Holland, *Pollution is Damaging Polar Bears' Dicks*, VICE (Jan. 27, 2015), <https://www.vice.com/en/article/bn5epa/first-the-melting-ice-caps-now-pollution-is-making-polar-bears-dicks-smaller-393>. While such studies are provocative and tremendously impactful when it comes to rallying the