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Chasing Results from the Chasing Arrows: Strategies for the United States to Stop Wasting Time and Resources When it Comes to Recycling, 52 UIC J. Marshall L. Rev. 147 (2018)

Christina Everling

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CHASING RESULTS FROM THE CHASING ARROWS: STRATEGIES FOR THE UNITED STATES TO STOP WASTING TIME AND RESOURCES WHEN IT COMES TO RECYCLING

CHRISTINA M. EVERLING*

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Abstract

The United States is a leader when it comes to creating waste, but not when it comes to disposing of that waste in environmentally conscious ways, such as through recycling. While other countries

boast recycling rates over 60 percent, the United States' recycling rate is an unimpressive 25 percent. Even amidst a "zero waste" movement, there are few national efforts to increase our recycling rate. Some state and local communities have picked up the slack, implementing a variety of strategies to boost their recycling output and reduce waste. These initiatives, such as automatic curbside recycling, landfill bans, mandatory recycling, container deposit laws, and Pay-As-You-Throw programs can be applied nationally to reduce the United States' waste output and increase its recycling rate. This comment explains the Federal Government's authority to regulate recycling, why it should do so, and the options available to achieve results.

I. INTRODUCTION

A. *The United States: All Take, No Give*

Home to five percent of the world's population, the United States consumes 30 percent of global resources and contributes to 30 percent of the world's waste.¹ Despite its greedy consumption, the United States has been slow to react to the global resource depletion other countries are working to prevent. This comment focuses on municipal solid waste ("MSW"), which is garbage or trash generated by homes, institutions, and commercial businesses.² MSW includes "product packaging, grass clippings, furniture, clothing, bottles and cans, food scraps, newspapers, appliances, consumer electronics, and batteries."³ It excludes "municipal wastewater treatment sludges, industrial process wastes, automobile bodies, combustion ash, or construction and demolition debris."⁴

MSW generated in the United States has remained a consistent 4.4 pounds per person per day.⁵ In comparison, the global average is about 2.6 pounds of MSW per person per day.⁶ While

* Lead Articles Editor; Staff Editor, THE JOHN MARSHALL LAW REVIEW. J.D. Candidate, The John Marshall Law School, 2019. B.S., North Dakota State University, 2013.

1. Emilio Lamanna, Note, *The Wealth in Waste: America's Ability to Enter the Waste to Energy Market by Embracing European Landfill Diversion, Waste Framework, and Renewable Energy Laws and Waste to Energy Initiatives*, 25 CARDOZO J. INT'L & COMP. L. 347, 352-53 (2017).

2. U.S. ENVTL. PROT. AGENCY, REPORT ON THE ENVIRONMENT: MUNICIPAL SOLID WASTE, at 1 (2016).

3. *Id.*

4. *Id.*

5. U.S. ENVTL. PROT. AGENCY, EPA530-R-17-01, ADVANCING SUSTAINABLE MATERIALS MANAGEMENT: 2014 FACT SHEET 13 (2016).

6. Paul Muggeridge, *Which Countries Produce the Most Waste?*, WORLD ECON. F. (Aug. 20, 2015), www.weforum.org/agenda/2015/08/which-countries-produce-the-most-waste/.

waste generation rates fell slightly⁷ as a result of the 2008 economic collapse,⁸ per capita recycling has remained steady at only 1.1 pounds per day, or 25 percent, since 2005.⁹ Reports often indicate national recycling rates around 35 percent, but it is important to note that these rates include composting as well as recycling, which augments the statistic.¹⁰ For example, in 2014, the United States generated 258.5 million tons of waste.¹¹ 66.4 million tons were recycled (25.7 percent) and 23 million tons were composted (8.9 percent) for a combined material recovery of 89.4 million tons or 34.6 percent.¹² Composting data may or may not be separated from recycling data and the combination of recycling and composting might be designated as “recovery” or simply “recycling.”¹³ While composting is an important and effective landfill diversion strategy that deserves more attention, this comment focuses on recycling and only includes composting insofar as it is incorporated into recycling data.

The previously mentioned 35 percent recycling rate has plateaued over the past five years¹⁴ and ranks a mere one percent ahead of the global average rate, as reported by the Organization for Economic Cooperation and Development (“OECD”).¹⁵ Meanwhile, Germany is “winning the recycling race” with a 65

7. Daily per capita rates reached a high of 4.7 pounds from 2000-2005 but fell to the current constant of 4.4 pounds. U.S. ENVTL. PROT. AGENCY, *supra* note 5.

8. *See* U.S. ENVTL. PROT. AGENCY, *supra* note 2 (noting that economic growth is correlated with increased consumption).

9. U.S. ENVTL. PROTEC. AGENCY, *supra* note 5.

10. *See, e.g.*, U.S. ENVTL. PROT. AGENCY, *supra* note 5, at 5 (showing a pie chart of MSW management with three categories: combustion with energy recovery (12.8 percent); landfilled (52.6 percent); and recycling and composting (34.6 percent)).

11. U.S. ENVTL. PROT. AGENCY, *supra* note 5, at 11.

12. *Id.*

13. *See, e.g.*, U.S. ENVTL. PROT. AGENCY, EPA530-R-13-001, MUNICIPAL SOLID WASTE IN THE UNITED STATES: 2011 FACTS AND FIGURES (2013) (containing data tables with categories for “recovery for recycling,” “recovery for composting,” “total materials recovery,” as well as a pie chart of MSW management showing how much waste was recovered, combusted with energy recovery, and discarded).

14. U.S. ENVTL. PROT. AGENCY, SUSTAINABLE MATERIALS MANAGEMENT PROGRAM STRATEGIC PLAN: FISCAL YEAR 2017-2022 7 (2015).

15. ORG. FOR ECON. COOP. & DEV., ENVIRONMENT AT A GLANCE 2015: OECD INDICATORS 50 (2015), read.oecd-ilibrary.org/environment/environment-at-a-glance-2015_9789264235199-en#page52. The Organization for Economic Cooperation Development (“OECD”) is a collective of 35 member countries that work together to solve common problems. The OECD also sets international standards, measures progress, and recommends policies in a variety of areas to promote global improvement. Most applicable to this paper, the OECD tracks and reports on the municipal waste practices of its member states. *About the OECD*, ORG. FOR ECON. CO-OPERATION & DEV., www.oecd.org/about/ (last visited Dec. 20, 2018).

percent rate, followed by South Korea at 59 percent.¹⁶ It is time for the United States to take charge of its waste production and start contributing to the global waste reduction effort by increasing its recycling output.

This comment will examine the current recycling framework in the United States as it relates to the country's MSW recycling goals. Section II of this comment explores the history and future outlook of waste management and MSW recycling in the United States. Section III will analyze different recycling initiatives in the United States, while drawing on international practices used in countries with successful recycling programs. Section IV will propose that Congress provide more comprehensive guidelines for states and municipalities to develop their recycling laws. In addition to providing guidelines, Congress needs to ensure that effective recycling programs are available in every municipality. Finally, Section V will conclude the United States needs to implement national recycling policies to catch up with the progress of other developed nations.

II. BACKGROUND

This section examines the history and future of waste management and recycling in the United States. First, it delves into the history of waste management strategies and their development into more environmentally friendly and economically efficient practices during the nineteenth and twentieth centuries. Then it looks at twenty-first century projections and goals as waste management evolves into materials management.

A. *Waste Management and Recycling in the United States: A Look Back*

1. *Nineteenth Century*

In the late nineteenth century, garbage disposal was an individual's responsibility, as cities did not yet have garbage policies in place.¹⁷ Waste was primarily burned or dumped into rivers or oceans.¹⁸ The odor produced by burning waste, combined with the increased production and consumption resulting from the

16. Niall McCarthy, *The Countries Winning the Recycling Race [Infographic]*, FORBES (Mar. 4, 2016), www.forbes.com/sites/niallmccarthy/2016/03/04/the-countries-winning-the-recycling-race-infographic/#5803fc12b3da.

17. Ann E. Carlson, *Recycling Norms*, 89 CALIF. L. REV. 1231, 1254-55 (2001).

18. Lolita Petrova Nikolova, *History of Consumption and Waste, U.S. 1850-1900*, in 1 ENCYCLOPEDIA OF CONSUMPTION AND WASTE 358, 360 (Carl A. Zimring & William L. Rathje eds., 2012).

Industrial Revolution, created a discernable garbage problem, which prompted a shift in responsibility from the individual to the municipality.¹⁹

In 1895, “source separation” was introduced in New York to more efficiently recover anything of value that might be found in household waste.²⁰ Source separation means separating different types of reusable materials from trash and putting each material into a different container for collection.²¹ The theory was that mixed waste (reusable material that has not been separated from garbage) limited disposal options, but through separation at the source, the city could recover part of the costs of collection by selling and reprocessing certain items.²² Though not a novel concept, source separation had never been attempted on such a large scale.²³ To accomplish this feat, forty policemen were sent door-to-door to residences and businesses to explain the new policy of separating different types of waste into individual containers.²⁴ Those who failed to comply with the mandate could be fined or arrested.²⁵ The program was met with resistance at first, but within a couple of years city leaders deemed the program a “moderate success” and cities across the nation began to adopt the strategy.²⁶

2. Twentieth Century

Though urban areas were expanding and multiplying in the early 1900s,²⁷ waste disposal strategies largely remained the responsibility of citizens.²⁸ Municipalities slowly began to institute trash collection, but not until the 1930s did it become widespread as a way to beautify cities and prevent disease.²⁹ Cities now buried waste in addition to continuing to dump it into waters and burn it (now dubbed “incineration”).³⁰ Reuse of materials was all but abandoned in favor of these incineration methods.³¹ In fact, it was

19. Carlson, *supra* note 17, at 1255.

20. MARTIN V. MELOSI, GARBAGE IN THE CITIES 57 (2005).

21. Danielle Peacock, *ReLoop: What is Source Separated Recycling?*, GREENBLUE, greenblue.org/reloop-what-is-source-separated-recycling/ (last visited Oct. 25, 2017).

22. MELOSI, *supra* note 20.

23. *Id.*

24. *Id.*

25. *Id.* at 58.

26. *Id.*

27. *Id.* at 141.

28. Ann Folino White, *History of Consumption and Waste, U.S. 1900-1950*, in 1 ENCYCLOPEDIA OF CONSUMPTION AND WASTE, *supra* note 18, at 361, 361.

29. *Id.* at 364.

30. *Id.* Effectively, cities were directly polluting all aspects of the Earth: land by burying waste; water by dumping waste into rivers, lakes, and oceans; and air through incineration. *Id.*

31. *Id.*

not until 1926 that the term “recycling” was even created.³²

In the 1930s, New York City, New York and Fresno, California implemented a sanitary landfill technique.³³ The same technique gained popularity in Great Britain a decade earlier.³⁴ During World War II, the federal government developed a patriotic campaign to encourage recycling as a social norm.³⁵ However, when the war ended, the “patriotic necessity” to recycle also ended, and the sanitary landfill gained popularity.³⁶

In the 1950s, standards for sanitary landfills were developed and the technique was adopted in many other cities, appearing to be the most economical form of solid waste management.³⁷ Thus, the end of the war and the subsequent economic boom, combined with the rise of sanitary landfills, effectively converted the United States from a recycling society to a “throwaway” society,³⁸ where only six percent of MSW generated was recycled.³⁹

In an effort to protest against overconsumption, recycling developed in the 1960s as a “grassroots method of source reduction”⁴⁰ to combat the national issue of solid waste.⁴¹ But Congress was also concerned with the country’s waste management (or lack thereof), finding that it had become a matter of national concern that necessitated federal action.⁴² Consequently, in 1965, Congress enacted the Solid Waste Disposal Act (“SWDA”). Especially pertinent to recycling, Congress noted in the SWDA that “millions of tons” of reusable materials were going to landfills despite available methods of separating such material, and that recovering these materials could reduce the United States’ dependence on foreign resources while reducing the national debt.⁴³

At the end of the 1960s, environmental issues became

32. Max Liboiron, *Recycling*, in 2 ENCYCLOPEDIA OF CONSUMPTION AND WASTE 735, 735 (Carl A. Zimring & William L. Rathje eds., 2012). At the time, “recycling” described the process of “sending partially refined oil back through the refining process.” *Id.*

33. Sanitary landfill is a waste disposal method based on the principles of engineering and aimed at confining waste to the smallest area and volume and regularly covering it with soil to minimize nuisances or hazards to public health or safety. John M. Bell, *Sanitary Landfill Method of Solid Waste Disposal*, PURDUE ROAD SCH. 110, 112 (1973).

34. Martin V. Melosi, *Down in the Dumps: Is There a Garbage Crisis in America?*, 5 J. POL’Y HIST. 100, 107 (1993).

35. Carlson, *supra* note 17, at 1257.

36. Anthony R. DePaolo, *Plastics Recycling Legislation: Not Just the Same Old Garbage*, 22 B.C. ENVTL. AFF. L. REV. 873, 874 (1995).

37. Melosi, *supra* note 34.

38. DePaolo, *supra* note 36, at 874.

39. U.S. ENVTL. PROT. AGENCY, *supra* note 2, at 2.

40. Melosi, *supra* note 34, at 112.

41. MELOSI, *supra* note 20, at 190.

42. See 42 U.S.C. § 6901(a) (1965) (explaining the problems with solid waste management and Congress’s solution).

43. 42 U.S.C. §6901(c) (1965).

prevalent and too difficult to ignore;⁴⁴ as a result, in 1970, Earth Day⁴⁵ was born. This campaign garnered such widespread support among interest groups and across the political spectrum that it led to the formation of the United States Environmental Protection Agency (“EPA”).⁴⁶ Compounded by public outcry for change, uncertainty that sanitary landfills would be able to handle future demands of waste disposal⁴⁷ caused recycling to become “an essential component of solid-waste management and a cost-effective way to reduce dependence on landfills.”⁴⁸

In 1971, Oregon introduced the first bottle deposit bill which incentivized citizens to recycle beer and soda bottles in exchange for one nickel per container returned.⁴⁹ By 1974, over one hundred

44. See Jack Lewis, *The Spirit of the First Earth Day*, EPA J. (Jan/Feb 1990), archive.epa.gov/epa/aboutepa/spirit-first-earth-day.html (describing environmental concerns of the late 1960s, such as air pollution, noxious fumes, pesticide use, overfishing, and contaminated waters (particularly Cleveland’s Cuyahoga River, which was so toxic it spontaneously combusted), that influenced the necessity for environmental intervention).

45. Earth Day was conceptualized by Wisconsin Senator Gaylord Nelson in reaction to the environmental devastation occurring in the United States. *The History of Earth Day*, EARTH DAY NETWORK, www.earthday.org/about/the-history-of-earth-day/ (last visited Oct. 20, 2017). One of the biggest devastations at the time was the Santa Barbara oil spill of 1969, which released over 3 million gallons of crude oil into the ocean and affected 35 miles of California coastline. See, e.g., Christine Mai-Duc, *The 1969 Santa Barbara Oil Spill that Changed Oil and Gas Exploration Forever*, L.A. TIMES (May 20, 2015), www.latimes.com/local/lanow/la-me-ln-santa-barbara-oil-spill-1969-20150520-htmlstory.html (reminiscing about the 1969 spill in the wake of another, though smaller, spill in the same vicinity in 2015). Modeled after the student anti-war movement, Nelson sought to incorporate environmental protection into the national political agenda through a “national teach-in on the environment,” spurring 20 million U.S. Americans to rally across the country. EARTH DAY NETWORK, *supra* note 45.

46. *Id.* Within a decade, much of the basic environmental protection legislation was passed, including the Clean Air Act, the Water Quality Improvement Act, the Water Pollution and Control Act Amendments, the Resource Recovery Act, the Resource Conservation and Recovery Act, the Toxic Substances Control Act, the Occupational Safety and Health Act, the Federal Environmental Pesticide Control Act, the Endangered Species Act, the Safe Drinking Water Act, the Federal Land Policy and Management Act, and the Surface Mining Control and Reclamation Act. Gaylord Nelson, *Earth Day ’70: What It Meant*, EPA J. (Apr. 1980), archive.epa.gov/epa/aboutepa/earth-day-70-what-it-meant.html.

47. Melosi, *supra* note 34.

48. *Id.* at 112. (quoting ROBERT EMMET LONG, *THE PROBLEM OF SOLID WASTE DISPOSAL* 17 (1989)).

49. Finn Arne Jørgensen, *A Pocket History of Bottle Recycling*, ATLANTIC (Feb. 27, 2013), www.theatlantic.com/technology/archive/2013/02/a-pocket-history-of-bottle-recycling/273575/. By 1980, eight states (Vermont, Connecticut, Delaware, Iowa, Massachusetts, Maine, Michigan, and New York) had also implemented bottle bills. *Id.* As of 2017, California, Connecticut, Hawaii, Iowa, Maine, Massachusetts, Michigan, New York, Oregon, and Vermont have bottle bills, with deposits ranging from 2¢ to 15¢. Jennifer Schultz, *State Beverage Container Deposit Laws*, NAT’L CONF. OF ST. LEGS.

municipalities had some sort of recycling program, primarily motivated by what some called “environmental patriotism.”⁵⁰ During that year, Missouri instituted one of the nation’s first curbside recycling programs, where residents could place their recycling in a bin or wheeled cart on their curb for pick up.⁵¹

While these early recycling programs laid the groundwork for future recycling efforts, they remained merely an alternative to landfilling.⁵² Prior to 1980, fewer than 140 communities had door-to-door collection for recycling.⁵³ But in 1981, Woodbury, New Jersey, instituted the first mandated recycling program in the United States.⁵⁴ The program required separation of “paper products, glass, aluminum, metal, garbage, trash and debris.”⁵⁵ Meanwhile, landfill space was becoming seemingly scarce as the citizen-led Not in My Backyard (“NIMBY”) opposition movement limited potential new landfill sites.⁵⁶

Later on in the decade, the “Garbage Barge” incident of 1987 would dominate media attention and serve as a wake-up call to the public about the nation’s consumption and waste disposal practices.⁵⁷ A barge (actually named the Mobro 4000) carrying six million pounds of garbage from New York⁵⁸ was rejected upon arriving at its destination in North Carolina.⁵⁹ Not only did North Carolina reject the ship, but six other states and three foreign countries rejected it as well.⁶⁰ It spent five months adrift, only to

(Sept. 21, 2017), www.ncsl.org/research/environment-and-natural-resources/state-beverage-container-laws.aspx.

50. Carlson, *supra* note 17, at 1258-59. Environmental patriotism is the concern for the amount of waste that is generated and disposed of. *Id.* The movement believes the “long range stability and well-being of [the] nation” depends on separating, using, and recovering waste. *Id.*

51. *Recycling*, CITY OF UNIV. CITY MO., www.ucitymo.org/691/Recycling (last visited Oct. 25, 2017).

52. Carlson, *supra* note 17, at 1259.

53. Blaise Farina & Carl A. Zimring, *History of Consumption and Waste, U.S., 1950-Present*, in 1 ENCYCLOPEDIA OF CONSUMPTION AND WASTE *supra* note 18, at 364, 368.

54. Mary Ellen Alu, *For Communities Doing It, Recycling Seems Old Hat*, MORNING CALL (Apr. 15, 1990), www.articles.mcall.com/1990-04-15/topic/2748592_1_mandatory-recycling-recycling-habits-woodbury. New Jersey implemented a statewide mandatory recycling law six years later. *Id.*

55. WOODBURY, N.J. CODE § 162-10 (1980).

56. Naomi Krogman, *NIMBY (Not in My Backyard)*, in 2 ENCYCLOPEDIA OF CONSUMPTION AND WASTE *supra* note 32, at 604.

57. Chaz Miller, *The Garbage Barge*, WASTE360 (Feb. 1, 2007), www.waste360.com/mag/waste_garbage_barge_recycling.

58. The garbage was specifically from Long Island, which, at the time only recycled one percent of its waste, but since 2010 recycles about a third of it. Emily C. Dooley & Carl MacGowan, *Long Island’s Infamous Garbage Barge of ’87 Still Influences Laws*, NEWSDAY (Mar. 22, 2017), projects.newsday.com/long-island/long-island-garbage-barge-left-islip-30-years-ago/.

59. Harry Hanbury, *Voyage of the Mobro 4000*, RETROREPORT (May 6, 2013), www.retroreport.org/video/voyage-of-the-mobro-4000/.

60. *Id.*

return to New York for disposal.⁶¹ After that, two-thirds of U.S. Americans opposed landfill siting in their community.⁶² As a result, and due to the (overstated)⁶³ landfill crisis⁶⁴ of the 1980s and 1990s, recycling made a comeback.⁶⁵

The 20th anniversary of Earth Day, Earth Day 1990,⁶⁶ prioritized recycling⁶⁷ and MSW management began to shift away from reliance on landfills, increasingly incorporating recycling into its programs.⁶⁸ In 1991, Wisconsin enacted the “strictest recycling law in the nation” in an effort to reduce its 6.5 million tons of garbage and recover the estimated \$100 million thrown away by landfilling recyclable materials.⁶⁹ The law was comprised of a three-phase ban⁷⁰ to eliminate “newspapers, plastic containers, glass containers, aluminum and steel cans, grass clippings, leaves, used motor oil, and household appliances from landfills” by 1995.⁷¹

61. *Id.*

62. Jonathan Phillip Meyers, Note, *Confronting the Garbage Crisis: Increased Federal Involvement as a Means of Addressing Municipal Solid Waste Disposal*, 79 GEO. L.J. 567, 572 (1991).

63. The “crisis” designation was convenient and simplified complex issues, redirecting the conversation regarding solid waste to that of short term, rather than long term solutions. MELOSI, *supra* note 20, at 195.

64. Waste volume was increasing while landfill space was decreasing. One third of the nation’s landfills were projected to close in the early 1990s with closures to increase to 80 percent of landfills within the following 20 years. Michael R. Harpring, *Out Like Yesterday’s Garbage: Municipal Solid Waste and the Need for Congressional Action*, 40 CATH. U.L. REV. 851, 857 (1991). *See also* MELOSI, *supra* note 20, at 194-95 (describing various studies proclaiming a “trash crisis” due to lack of landfill space and a rising fear of landfill closures).

65. Carlson, *supra* note 17, at 1259-60.

66. Coincidentally, the 20th anniversary of Earth day also followed the largest oil spill in United States coastal waters at the time. *See, e.g. Exxon Valdez Oil Spill*, NOAA OFF. OF RESPONSE AND RESTORATION, www.response.restoration.noaa.gov/oil-and-chemical-spills/significant-incidents/exxon-valdez-oil-spill (last visited Jan. 8, 2019) (describing the aftermath of the Exxon Valdez oil spill of 1989, which leaked 11 million gallons of oil into the ocean off of Alaska’s coast).

67. Press Release, U.S. Env’t. Prot. Agency, Statement on Earth Day 1990 (Apr. 20, 1990) *available at* archive.epa.gov/epa/aboutepa/statement-earth-day-1990.html.

68. A.J. Morrissey & J. Browne, *Waste Management Models and Their Application to Sustainable Waste Management*, 24 WASTE MGMT. 297, 298 (2004).

69. *Wisconsin Begins Mandatory Recycling Program*, KINGMAN DAILY MINER, Jan. 2, 1991, § 1, at 1 *available at* www.news.google.com/newspapers?id=3KtPAAAAIIBAJ&sjid=xFIDAAAAIIBAJ&pg=2229%2C166226.

70. Phase one banned used motor oil, old household appliances, and lead-acid batteries from landfills in 1991; in 1993, phase two banned yard waste; and in 1995 phase three banned newspapers, glass, plastic, aluminum, and steel cans. *Id.* *See* KENDRA BONDERUD, INFORMATIONAL PAPER 70: SOLID WASTE RECYCLING AND WASTE REDUCTION PROGRAMS (Jan. 2013) (detailing the 1991, 1993, and 1995 bans more thoroughly, as well as a 2010 ban on electronics and 2011 clarifying amendments to the ban).

71. KINGMAN DAILY MINER, *supra* note 69.

Meanwhile, California began implementing “comingled”⁷² recycling, where all recyclable materials are placed into the same bin, separate from other waste, to be recycled, to make recycling easier for consumers.⁷³ Because the various materials must still be separated in order to be reused, material recovery facilities (“MRFs”)⁷⁴ were created to take on the burden. In 1995, across the nation, the number of curbside recycling programs skyrocketed to over 7,000 programs.⁷⁵ These efforts resulted in great progress: in less than a decade, the amount of MSW the country was recycling had almost quadrupled!⁷⁶

B. Waste Management and Recycling in the United States: A Look Forward

1. Twenty-First Century

While the MSW recycling rate increased in the 1990s, it fell about eight percent in the 2000s.⁷⁷ The decline could be attributed to the variations⁷⁸ and fluctuations in curbside recycling programs.⁷⁹ This is surprising because during the early twenty-first century, the linear “cradle-to-grave” approach transitioned to a cyclical “cradle-to-cradle” model analyzing the lifecycle of materials.⁸⁰ The cradle-to-cradle approach highlights closed loop

72. Also referred to as “single-stream” recycling.

73. Sarah Laskow, *Single-Stream Recycling is Easier for Consumers, but is it Better?*, ATLANTIC (Sept. 18, 2014), www.theatlantic.com/technology/archive/2014/09/single-stream-recycling-is-easier-for-consumers-but-is-it-better/380368/. See also Carlson, *supra* note 17, at 1275-78 (elaborating on how decreasing effort needed to recycle increase participation).

74. Pronounced “murf.” Rick LeBlanc, *What is a Materials Recovery Facility (MRF) and How Does it Work?*, THE BALANCE (Nov. 3, 2016), www.thebalance.com/what-is-material-recovery-center-2877733. MRFs are categorized as either “dirty” or “clean” based on materials it separates: dirty MRFs sort through mixed waste to recover materials that have been missed by consumers or not separated at all, whereas clean MRFs sort through comingled recyclable materials. *Id.*

75. U.S. ENVTL. PROT. AGENCY, EPA530-S-97-015, CHARACTERIZATION OF MUNICIPAL SOLID WASTE IN THE UNITED STATES: 1996 UPDATE 2 (1997).

76. Carlson, *supra* note 17, at 1261. In 1990, the recycling rate of MSW was eight percent but by 1998 it had increased to 30 percent. *Id.*

77. Seejeen Park & Frances. S. Berry, *Analyzing Effective Municipal Solid Waste Recycling Programs: The Case of County-Level MSW Recycling Performance in Florida, USA*, 31-9 WASTE MGMT. & RES. 896, 896 (2013).

78. See THE RECYCLING P'SHIP, THE 2016 STATE OF CURBSIDE REPORT 5 (2017) (explaining that inconsistency among curbside program education leads to confusion and frustration among recyclers).

79. See, e.g., U.S. ENVTL. PROT. AGENCY, EPA-530-F-07-030, MUNICIPAL SOLID WASTE GENERATION, RECYCLING AND DISPOSAL IN THE UNITED STATES: FACTS AND FIGURES FOR 2006 8 (2007) (comparing the number of nationwide curbside recycling programs in 2002 and 2006).

80. Noah Sachs, *Planning the Funeral at the Birth: Extended Producer*

cycles where a discarded material is used in another product or process.⁸¹ It often takes the form of product take-back legislation or container deposits.⁸² Additionally, the EPA was advocating for recycling as a way to reduce greenhouse gas (“GHG”) emissions and fight climate change.⁸³

Fortunately, recycling flourished in some cities during the early 2000s. San Francisco, California fully embraced recycling, setting a goal in 2002 of Zero Waste by 2020.⁸⁴ Since then, more and more cities are joining the movement.⁸⁵ While definitions of zero waste vary between cities and organizations, “zero waste” is generally not intended to be taken literally because waste production is an inevitable part of any living organism’s function.⁸⁶ Instead, cities and organizations tend to use the term to describe landfill diversion of at least 90 percent and emphasize closed-loop systems or whole system approaches.⁸⁷ Since setting the first zero waste goal in 2002, San Francisco, in 2007, pioneered the disposable plastic bag ban.⁸⁸ As a result, San Francisco now boasts an 80

Responsibility in the European Union and the United States, 30 HARV. ENVTL. L. REV. 51, 53 (2006). The linear model involves (1) resource extraction; (2) manufacturing; (3) distribution; (4) consumption; and (5) resource destruction. *Zero Waste: The Choice for a Sustainable Community*, ECO-CYCLE, www.ecocycle.org/zerowaste (last visited Jan. 8, 2019).

81. Aimee Dars Ellis, *Packaging and Product Containers*, in 2 ENCYCLOPEDIA OF CONSUMPTION AND WASTE *supra* note 32, at 649.

82. Sachs, *supra* note 80.

83. U.S. ENVTL. PROT. AGENCY, EPA 530-E-03-002, REDUCING WASTE CAN MAKE A DIFFERENCE (2003). Landfills contribute almost one-fifth of methane gas emissions, putting it in the top three emitters in the United States. Justin Worland, *How Your Trash is Contributing to Climate Change*, TIME (Sept. 22, 2015), www.time.com/4042559/trash-climate-change-landfill. Methane follows carbon dioxide in terms of amount emitted, but methane is 25 times more damaging. *Id.*

84. *Zero Waste Case Study: San Francisco*, U.S. ENVTL. PROT. AGENCY, www.epa.gov/transforming-waste-tool/zero-waste-case-study-san-francisco (last visited Jan. 10, 2019). As San Francisco’s Zero Waste deadline approaches, the City has been forced to extend its deadline to 2030. Ellen Airhart, *San Francisco’s Dream of ‘Zero Waste’ Lands in the Dumpster*, WIRED (Sept. 28, 2018, 8:00 AM), www.wired.com/story/san-franciscos-dream-of-zero-waste-lands-in-the-dumpster. Reasons for the extension include challenges posed by single-use plastics, items that cannot be recycled, and China’s recycling ban. *Id.*

85. *See, e.g.*, David Bodamer, *10 Major U.S. Cities with Zero Waste Goals*, WASTE360 (July 27, 2015), www.waste360.com/waste-reduction/10-major-us-cities-zero-waste-goals (ranking cities with zero waste goals by 2014 population estimates); Lesley, Lammers, *Will These 10 U.S. Cities Achieve Zero Waste?*, EARTH911 (Feb. 3, 2016), earth911.com/business-policy/will-these-10-u-s-cities-achieve-zero-waste (detailing zero waste goals of five cities in California, two in Colorado, three in Texas, as well as six other cities in other states).

86. Robert Krausz, *Zero Waste*, in 2 ENCYCLOPEDIA OF CONSUMPTION AND WASTE *supra* note 32, at 1015.

87. *How Communities Have Defined Zero Waste*, U.S. ENVTL. PROT. AGENCY, www.epa.gov/transforming-waste-tool/how-communities-have-defined-zero-waste (last visited Oct. 29, 2017).

88. Chris Clarke, *5 Cities That Are Recycling Superstars*, TAKEPART (Sept.

percent recycling rate.⁸⁹

2. From Waste Management to Materials Management

Beginning in 2009, the EPA began to adjust its waste management strategy to fit within a framework of Sustainable Materials Management (“SMM”).⁹⁰ “Materials” include “everything that is extracted or derived from natural resources,” whether they are organic or inorganic.⁹¹ SMM moves beyond “Reduce, Reuse, Recycle,”⁹² focusing on “long-term system sustainability,” as opposed to managing an environmental impact.⁹³ It applies a holistic approach to waste management by evaluating social, environmental, and economic factors of material consumption with the purpose of using and reusing materials as productively and sustainably as possible.⁹⁴ The program aims to “conserve resources, reduce waste, slow climate change and minimize the environmental impacts of the materials we use.”⁹⁵ SMM is based on a four-tiered hierarchy that recognizes that multiple approaches are required for sustainable and effective waste management, but that particular approaches are more environmentally friendly and should be utilized when possible.⁹⁶ The most preferred waste management method is source reduction and reuse, followed by recycling and composting, then energy recovery.⁹⁷ Treatment and disposal is the least preferred waste management method.⁹⁸ Data collection regarding MSW generation, recycling, and disposal is an integral part of SMM.⁹⁹

17, 2014) takepart.com/article/2014/09/17/5-cities-are-recycling-superstars.

89. *Id.* San Francisco’s goal was to achieve a 90% recycling rate in 18 years. U.S. Env’tl. Protection Agency, *supra* note 84. It managed to reach an 80% rate in 10 years. Clarke, *supra* note 88.

90. U.S. ENVTL. PROT. AGENCY, *supra* note 14, at 2.

91. U.S. ENVTL. PROT. AGENCY, EPA530-R-09-009, SUSTAINABLE MATERIALS MANAGEMENT: THE ROAD AHEAD 11 (2009).

92. U.S. ENVTL. PROT. AGENCY, *supra* note 5, at 19.

93. U.S. ENVTL. PROT. AGENCY, *supra* note 91, at 15.

94. U.S. ENVTL. PROT. AGENCY, EPA530-R-17-002, ADVANCING SUSTAINABLE MATERIALS MANAGEMENT: 2016 RECYCLING ECONOMIC INFORMATION (REI) REPORT 2 (2016).

95. U.S. ENVTL. PROT. AGENCY, *supra* note 14, at 2.

96. *Sustainable Materials Management: Non-Hazardous Materials and Waste Management Hierarchy*, ENVTL. PROT. AGENCY, www.epa.gov/smm/sustainable-materials-management-non-hazardous-materials-and-waste-management-hierarchy (last visited Oct. 24, 2017) [hereinafter *Waste Management Hierarchy*].

97. *But cf.* Lamanna, *supra* note 1 (arguing that waste to energy initiatives should be a priority of the United States’ waste management and landfill diversion strategy as opposed to one of the least preferred methods).

98. ENVTL. PROT. AGENCY, *supra* note 96.

99. U.S. ENVTL. PROT. AGENCY, EPA-530-F-14-001, MUNICIPAL SOLID WASTE GENERATION, RECYCLING AND DISPOSAL IN THE UNITED STATES: FACTS AND FIGURES FOR 2012 13 (2014).

The definition of recycling under the SMM approach has been reworked to incorporate material transformation into new products.¹⁰⁰ The purpose of including material transformation in recycling's definition is to emphasize reducing the use of virgin raw materials in product manufacturing.¹⁰¹ The 2017-2022 SMM Program focuses on three Strategic Priority Areas: (1) the built environment; (2) sustainable food management; and (3) sustainable packaging.¹⁰² The objective of SMM is "decreas[ing] the disposal rate" through "source reduction, reuse, recycling, and prevention."¹⁰³ As a result of the program, the EPA anticipates an increase across many recycling indicators: quantity collected per capita, yield rate (i.e. quality), average pounds per year collected from households, and collection access and participation.¹⁰⁴ The EPA has clearly emphasized landfill diversion as a top priority, but the agency continues to function merely as support for state and local governments.¹⁰⁵

III. ANALYSIS

This section will first explore the federal government's authority to regulate recycling. Next, it will evaluate some of the recycling strategies implemented throughout the United States, as well as the system used by the recycling leader, Germany. Finally, this section will examine why recycling in the United States is stagnating.

A. Federal Authority to Regulate Recycling

1. The Resource Conservation and Recovery Act

The foundation of SMM comes from the Resource Conservation and Recovery Act ("RCRA"), enacted in 1976 to regulate solid waste disposal and amend the Solid Waste Disposal Act ("SWDA").¹⁰⁶ The

100. U.S. ENVTL. PROT. AGENCY, *supra* note 94, at 3.

101. *Id.*

102. U.S. ENVTL. PROT. AGENCY, *supra* note 14, at 3.

103. *Id.* Other objectives include environmental impact reduction over the life cycle of materials, augmented socio-economic benefits, and more widespread and inclusive implementation of program policies, practices and incentives. *Id.*

104. *Id.*

105. Carlson, *supra* note 17, at 1262.

106. Resource Conservation and Recovery Act, 42 U.S.C. §§ 6901 *et seq.* (1984). The RCRA only regulates solid wastes. Kenneth M. Kastner, *Recycling and the Definition of Solid Waste*, in THE RCRA PRAC. MANUAL 29, 29 (Theodore L. Garrett ed., 3d ed. 2013). To be classified as solid waste, a material must be physically solid (*see* 42 U.S.C. § 6903(27) (defining and providing examples of what it means for a material to be solid)), discarded, and not excluded from regulation. Kastner, *supra*, at 31. The EPA's authority with regard to recyclable materials is based on the "counterintuitive presumption" that materials that

RCRA's principal focus is on hazardous waste regulation, however, in 1988, it was amended to include Subtitle D.¹⁰⁷ This amendment contains provisions that allow the EPA to regulate non-hazardous waste, though the EPA does so minimally.¹⁰⁸ Subtitle D primarily functions to regulate MSW landfills in terms of location, structure, and procedure for operation and closure.¹⁰⁹ Despite having authority under the RCRA, the federal government does not regulate MSW disposal or recycling, leaving it to state and local governments to regulate and enforce.¹¹⁰

2. *The Commerce Clause*

The federal government has authority to regulate recycling based on Congress's broad authority under the Commerce Clause.¹¹¹ Per the Dormant Commerce Clause, the Supreme Court has consistently treated solid waste as commerce.¹¹² Because recyclable materials are deemed solid waste under the RCRA,¹¹³ it too falls within Congress's scope of regulation.¹¹⁴ Furthermore, in *Hodel v. Va. Surface Mining & Reclamation Ass'n*, the Supreme Court held that "the power conferred by the Commerce Clause [is] broad enough to permit congressional regulation of activities causing air or water pollution, or other environmental hazards that may have effects in more than one State."¹¹⁵ Waste disposal strategies can cause pollution or other environmental hazards,¹¹⁶ therefore Congress is authorized to regulate recycling as a method of waste disposal.

may be reused and recycled are considered to be discarded. *Id.* But, to avoid overregulation and ensure regulation of disposed of products as opposed to materials still in the manufacturing process, the EPA created exclusions based on the type of recycled material and the process for recycling it. *Id.*

107. Harpring, *supra* note 64, at 852-53.

108. *Id.*

109. Hannah McCrea, Note, *Germany's "Take-Back" Approach to Waste Management: Is There a Legal Basis for Adoption in the United States?*, 23 GEO. INT'L ENVTL. L. REV. 513, 517 (2011).

110. Harpring, *supra* note 64, at 862-63.

111. McCrea, *supra* note 109, at 522.

112. *Id.* at 523. *See also* Fort Gratiot Sanitary Landfill v. Mich. Dep't of Nat. Res., 504 U.S. 353, 359 (1992) (explaining that even though solid waste has no value, it is nonetheless an article of commerce and its regulation is subject to the Commerce Clause).

113. The EPA regulates recyclable materials as solid waste.

114. Kastner, *supra* note 106, and accompanying text.

115. *Hodel v. Va. Surface Mining & Reclamation Ass'n*, 452 U.S. 264, 282 (1981).

116. *See* Lewis, *supra* note 44 and accompanying text. Need explanatory parenthetical

3. *The Environmental Protection Agency*

In 2007, the Supreme Court held that “the EPA had the authority to regulate GHG emissions¹¹⁷ if it found them [to be] a threat to human health.”¹¹⁸ Subsequently, in 2009, the EPA confirmed the link between GHG emissions and human health in its 133-page response to the 2007 Supreme Court decision.¹¹⁹ It is well-documented that recycling reduces GHGs,¹²⁰ thereby putting recycling regulation within the purview of the EPA.

Nonetheless, a member of Congress has introduced a bill every year since 2009 attempting to rescind the EPA’s authority to regulate GHGs.¹²¹ While each year the various bills were defeated due to lack of support from Democrats, Republicans now control Congress and the White House making rescission more probable.¹²² Even so, with an intact filibuster and enough Democrats in Congress, stripping the EPA’s authority to regulate GHGs is still relatively unlikely.¹²³ But even if an act, such as the Stopping EPA Overreach Act of 2017¹²⁴ is enacted, the Federal Government retains authority to regulate recycling through the RCRA and the Commerce Clause.

117. Greenhouse gases “trap heat in the atmosphere.” *Overview of Greenhouse Gases*, ENVTL. PROT. AGENCY, www.epa.gov/ghgemissions/overview-greenhouse-gases (last visited Dec. 19, 2018). GHGs include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and fluorinated gases. *Id.*

118. Stephen T. Schroth, *Environmental Protection Agency, U.S.*, 1 ENCYCLOPEDIA OF GLOBAL WARMING AND CLIMATE CHANGE 524, 524 (S. George Philander ed., 2d ed. 2012) (citing *Massachusetts v. EPA*, 549 U.S. 497 (2007)).

119. Schroth, *supra* note 118; Robin Bravender, *EPA Finds Six Greenhouse Gases Endanger Human Health*, SCI. AM. (Apr. 17, 2009), scientificamerican.com/article/epa-greenhouse-gasses-endanger/.

120. *See, e.g.*, U.S. ENVTL. PROT. AGENCY, *supra* note 5, at 15 (showing how recycling specific materials has greenhouse gas benefits and equating those benefits with the equivalent number of cars removed from the road each year).

121. Natasha Geiling, *What Happens if the EPA is Stripped of its Power to Fight Climate Change?*, THINK PROGRESS (Apr. 3, 2017, 4:21 PM), thinkprogress.org/congress-epa-clean-air-act-greenhouse-gas-legal-7b1882673927.

122. *Id.*

123. A bill to curb the EPA’s authority to regulate GHGs was introduced in the House of Representatives on January 24, 2017 and was referred to four committees and one subcommittee. *All Actions H.R. 637 – 115th Congress (2017-2018)*, CONGRESS.GOV, www.congress.gov/bill/115th-congress/house-bill/637/all-actions?overview=closed#tabs (last visited Apr. 9, 2018). The congressional session ended without taking further action on the bill. *Id.*

124. The Stopping EPA Overreach Act of 2017 would prohibit federal regulatory agencies from regulating greenhouse gases, reclassify the term ‘air pollutant’ to exclude carbon dioxide, water vapor, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, or sulfur hexafluoride, and revoke any authority of various environmental acts as requiring regulation of climate change. Stopping EPA Overreach Act of 2017, H.R. 637, 115th Cong. (2017).

B. Recycling in the United States: “The Only Standard is That There is No Standard”¹²⁵

Six percent of U.S. Americans, the equivalent of about 20 million people, do not have access to recycling.¹²⁶ The United States government provides few federal recycling regulations, leaving waste management entirely up to the states. While some states have enacted statewide regulations, other states further delegate recycling standards to counties or even individual cities.¹²⁷ This means that what may be recyclable in one city may not be recyclable in a neighboring city – even if the recycling goes to the same sorting facility!¹²⁸ Such widespread variations create confusion and counterproductively discourage recycling participation.¹²⁹

Some argue the current recycling system is designed for failure.¹³⁰ Twenty-two percent of U.S. Americans say their community does not encourage recycling.¹³¹ Conversely, only 28 percent believe their community strongly encourages recycling.¹³² It is estimated that a single household produces 800 to 1000 pounds of recyclables annually, yet only 357 pounds actually gets recycled.¹³³ While the EPA would like to see higher recycling performance, it is not taking the necessary action to effectuate the increase.

1. Curbside Recycling

“Curbside recycling” refers to programs where recycling is collected from single-family homes, often from bins, bags, or carts at the curb of the residence.¹³⁴ A recent study by the Sustainable Packaging Coalition determined that 73 percent of the United States has access to curbside recycling, but only about half have automatic curbside access.¹³⁵ Automatic curbside recycling means

125. THE RECYCLING P'SHIP, *supra* note 78, at 11.

126. SUSTAINABLE PACKAGING COAL., 2015-16 CENTRALIZED STUDY ON AVAILABILITY OF RECYCLING 16 (2016).

127. THE RECYCLING P'SHIP, *supra* note 78, at 11.

128. See Jennifer A. Haugh, *Decisions, Decisions: Cleaning Up America's Recycling Confusion*, 11 KENNEDY SCH. REV. 32, 34 (2011) (explaining that, despite recyclables being taken to the same sorting facility, phone books may be recycled in Cary, North Carolina, but not in Durham, North Carolina, less than 20 minutes away).

129. *Id.*

130. *Id.*

131. Drew DeSilver, *Perceptions and Realities of Recycling Vary Widely from Place to Place*, PEW RES. CTR. (Oct. 7, 2016), www.pewresearch.org/fact-tank/2016/10/07/perceptions-and-realities-of-recycling-vary-widely-from-place-to-place/.

132. *Id.*

133. THE RECYCLING P'SHIP, *supra* note 78, at 10.

134. *Id.* at 6.

135. SUSTAINABLE PACKAGING COAL., *supra* note 126.

that recycling services, including bins or carts, are a standard part of residential waste collection services, whether they are provided by the municipality or through a contractor.¹³⁶

Other curbside programs are primarily subscription-based, meaning residents are individually responsible for hiring a private recycling provider and costs may or may not be bundled with trash collection.¹³⁷ Some of these programs, however, are opt-in programs, which require an individual to sign up for the program and potentially pay an extra fee.¹³⁸ However, fewer than one-third of residents are estimated to opt-in or subscribe to recycling programs.¹³⁹ Meanwhile, 93 percent of communities that collect over 400 pounds of recycling per household per year (considered to be “high-performing communities”) provide automatic collection.¹⁴⁰ Furthermore, 84 percent of U.S. Americans who believe their community strongly encourages recycling have curbside programs.¹⁴¹

Consistent with study results, residents of rural towns in West Virginia and Ohio say not having curbside recycling service in addition to their curbside garbage service impacts whether they recycle.¹⁴² Curbside recycling can be problematic for rural communities because there is a decreased volume of recyclable materials, making it difficult for haulers to generate a profit.¹⁴³ Additionally, the diesel fuel required to pick up recycling from rural areas may offset the environmental benefits of recycling.¹⁴⁴ But the driving force for the lack of recycling options in rural communities is economic.¹⁴⁵ There may not be recycling facilities close enough to provide a service, or residents may not be willing to pay for recycling services because they would be cost-prohibitive.¹⁴⁶

A “hub and spoke” method of recycling may help ease the

136. *Id.* at 7.

137. *Id.*

138. *Id.* at 7, 14. 21 percent of U.S. Americans have access to subscription programs while six percent must opt into a recycling program. *Id.* at 14.

139. SUSTAINABLE PACKAGING COAL., *supra* note 126, at 17. An estimated 38 percent of residents to opt into recycling programs, where available, while an estimated 30 percent subscribe to recycling programs. *Id.*

140. THE RECYCLING P'SHIP, *supra* note 78, at 16.

141. DeSilver, *supra* note 131.

142. Janelle Patterson, *Recycling a Challenge for Rural Washington County Residents*, PARKERSBURG NEWS AND SENTINEL (Mar. 17, 2018), newsandsentinel.com/news/local-news/2018/03/recycling-a-struggle-for-rural-washington-county-residents/.

143. ABC4 News, *Recycle This: Recycling in Rural Communities*, GOOD4UTAH.COM (Apr. 27, 2015, 3:05 PM), www.good4utah.com/news/local-utah-state-news-/recycle-this-recycling-in-rural-communities/205965234.

144. Cassidy Riley, *Rural Residents Face Limits to Recycling*, GAZETTE (Feb. 14, 2015) www.thegazette.com/subject/news/rural-residents-face-limits-to-recycling-20150214.

145. *Id.*

146. *Id.*

financial burden. In this system, “hubs” are central pooling stations typically located in larger communities that process the recycling and benefit from its value.¹⁴⁷ “Spokes” extend to rural areas to provide the recyclable materials to the hub.¹⁴⁸ Because it is the hubs, not the spokes, that benefit from the recyclables, the spokes are not liable for any operating expenses of the hub’s recycling facility.¹⁴⁹ According to an evaluation of the system’s implementation in New Mexico, the hub and spoke method “greatly reduce[s] transportation requirements and increase[s] overall efficiency of program operations from both a capital and operational cost perspective.”¹⁵⁰ As a result of New Mexico’s “Hub & Spoke” program, rural access to recycling increased from 81 communities to 196 communities within 30 miles in a short five-year period.¹⁵¹

2. Landfill Bans

Landfill bans prohibit certain materials from being disposed of via landfill.¹⁵² Every state in the United States except Montana has some sort of landfill ban in effect.¹⁵³ Banned materials, and the bans themselves, vary from state to state and even vary within states.¹⁵⁴ For example, in Arkansas, landfills may not have the same requirements because of the state’s landfill classification structure.¹⁵⁵ As a result, materials banned from some landfills may be exempt for other landfills.¹⁵⁶ In Delaware, some materials are not explicitly banned, but are instead characterized as hazardous waste

147. Mallory Szczepanski, *The Benefits of a Hub and Spoke Recycling System*, WASTE360 (Jan. 19, 2018), www.waste360.com/business/benefits-hub-and-spoke-recycling-system.

148. *Id.*

149. *Id.*

150. SCS ENG’RS, RURAL IOWA HUB AND SPOKE RECYCLING PROJECT FINAL REPORT 18 (2017). New Mexico’s Hub & Spoke project was created in response to the state’s 2007 Solid Waste Management Plan which made access to recycling the number one priority because access was the biggest barrier to recycling. *Id.* 85 percent of New Mexico’s communities are classified as rural. *Id.* at 21.

151. *Id.* at 22.

152. Trey Granger, *What’s Banned in Landfills: A State-by-State Guide*, EARTH911 (Nov. 27, 2017), earth911.com/business-policy/landfill-bans/. The most commonly banned material is lead acid batteries, such as car batteries. *Id.* 45 states prohibit lead acid battery disposal in landfills. NE. RECYCLING COUNCIL, DISPOSAL BANS & MANDATORY RECYCLING IN THE UNITED STATES 2 (2017). Other commonly banned materials include waste oil, tires, liquid wastes, and untreated infectious wastes. *Id.*

153. *Id.* at 1. The prevalence of rural and small towns in Montana make it difficult for the state to implement cost effective options for landfills, and instead it heavily regulates some materials rather than banning them completely. *Id.* at 82.

154. *See id.* (listing materials banned from landfills in each state).

155. NE. RECYCLING COUNCIL, *supra* note 152 at 10.

156. *Id.*

and banned by default under the RCRA.¹⁵⁷ In Ohio, the bans apply to the disposal facility rather than the hauler or generator.¹⁵⁸

Enforcement of landfill bans also varies. In Massachusetts, solid waste disposal facilities must submit waste ban compliance plans detailing ban enforcement strategies to the Massachusetts Department of Environmental Protection (“MassDEP”).¹⁵⁹ MassDEP also provides guidelines and training protocol resources for waste hauler employees of all functions.¹⁶⁰ In addition to waste inspection by the facility, MassDEP inspects solid waste facilities to ensure compliance and to hold facility operators, solid waste haulers, and solid waste generators responsible.¹⁶¹ Conversely, in Indiana, e-waste¹⁶² is banned from MSW, but neither waste collectors nor disposal facilities are required to enforce the ban.¹⁶³

3. Mandatory Recycling

Though landfill bans keep certain materials out of landfills, banned materials are not necessarily required to be recycled.¹⁶⁴ While 49 states have landfill bans, only 22 states have mandatory recycling laws.¹⁶⁵ Mandatory recycling laws impose fines for putting particular materials in the garbage bin rather than a recycling bin.¹⁶⁶ Because mandatory recycling requires people to ensure recyclables are not in with the trash, it would seem that garbage cans would be subject to inspection, and the process of ensuring compliance could potentially be a violation of an individual’s constitutional right to privacy. However, in *California v. Greenwood*, the Supreme Court reasoned that “plastic garbage bags left on or at the side of a public street are readily accessible to

157. *Id.* at 25.

158. *Id.* at 108.

159. MASS. DEP’T OF ENVTL. PROT., FACT SHEET: YOUR MUNICIPALITY AND WASTE BAN COMPLIANCE 1 (2017).

160. *See, e.g.*, MASS. DEP’T OF ENVTL. PROT., REVISED GUIDANCE FOR SOLID WASTE HANDLING AND DISPOSAL FACILITIES ON COMPLIANCE WITH MASSDEP’S WASTE BANS (2014) [hereinafter GUIDANCE FOR FACILITY COMPLIANCE] (advising solid waste handling and disposal facilities of how to comply with waste ban updates, including waste ban plans, monitoring, inspecting, recordkeeping and enforcement). *See also* MASS. DEP’T OF ENVTL. PROT., GUIDANCE BRIEF: HAULERS & WASTE BAN COMPLIANCE 1 (2017) [hereinafter GUIDANCE BRIEF FOR HAULER COMPLIANCE] (summarizing compliance procedure and policy examples).

161. *Id.*

162. E-waste is the common shorthand of “electronic waste” and describes electronics that are discarded or otherwise nearing the end of their lifecycle. *Understanding E-Waste*, Informational tab under *Cleaning Up Electronic Waste (E-Waste)*, ENVTL. PROT. AGENCY, www.epa.gov/international-cooperation/cleaning-electronic-waste-e-waste (last visited Dec. 19, 2018).

163. NE. RECYCLING COUNCIL, *supra* note 153, at 47.

164. Trey Granger, *supra* note 152.

165. *Id.*

166. *Id.*

animals, children, scavengers, snoops, and other members of the public.”¹⁶⁷ Moreover, there is no reasonable expectation of privacy in discarded items that are left “in an area particularly suited for public inspection . . . for the express purpose of having strangers take it.”¹⁶⁸

In 1999, the Village of Hamburg, New York (“the Village”) amended its Solid Waste Policy in response to a study showing residents were not complying with the mandated recycling provisions in the Municipal Solid Waste Law.¹⁶⁹ The amendment provided garbage collection only if the garbage was placed in clear bags so the Village could monitor recycling compliance without ripping open the bags to inspect the contents.¹⁷⁰ The amendment was challenged as an unconstitutional exercise of police power in violation of residents’ right to privacy.¹⁷¹ The Supreme Court of New York, Appellate Division held that the amendment “bears a reasonable relation to the public good” by promoting public health, safety and welfare, and conservation of energy and natural resources and is therefore constitutional.¹⁷²

In 2006, Seattle, Washington enacted mandatory recycling legislation that prohibited basic recyclables¹⁷³ from landfill disposal.¹⁷⁴ If recyclable materials comprise more than 10 percent of the garbage container, haulers will refuse the container and leave a tag to let the owner know.¹⁷⁵ The third tag received imposes a \$50 fine.¹⁷⁶ The program experienced quick success with 90 percent apartment and business compliance within months of implementation.¹⁷⁷ The program in Seattle is an example of successful enforcement strategies and privacy protection working

167. California v. Greenwood, 486 U.S. 35, 40 (1988).

168. *Id.*

169. Dobrzanski v. Village of Hamburg, 277 A.D.2d 1005, 1006 (App. Div. 2000).

170. *Id.* at 1005, 1006.

171. *Id.* at 1005.

172. *Id.* at 1006.

173. Paper, cardboard, aluminum, glass, and plastic. Jennifer Langston, *Mandatory Recycling Program Working Well*, SEATTLE PI (Mar. 14, 2006), www.seattlepi.com/local/article/Mandatory-recycling-program-working-well-1198413.php.

174. *Id.*

175. *Id.*

176. *Id.* The fine applies to businesses and apartments; residential households do not receive a fine, but their garbage will be tagged for sorting for the following week’s pickup. *Id.*

177. Michele Talsma Everson, *Mandate vs. Volunteer: What Works Better for Recycling?*, EARTH911 (Sep. 21, 2009), www.earth911.com/inspire/getting-involved/mandate-vs-volunteer-what-works-better-for-recycling/. Within the first two months, tags for apartments decreased from 71 tags in January to 44 in February. Langston, *supra* note 173. Tags for commercial businesses dropped from 10 to two during that time period, and garbage left behind at households fell from 227 cans to 133 cans (out of the over 150,000 cans collected each week). *Id.*

seamlessly together for the greater good.¹⁷⁸ The Seattle strategy is not to police recycling, but rather encourage better recycling practices.¹⁷⁹

4. *Incentivizing Recycling*

In the United States, most consumers treat waste disposal with an “out of sight, out of mind” mentality because they are not held accountable for the costs of disposing the materials they purchase.¹⁸⁰ Instead, the costs are externalized and placed on society, leading to a disregard of consumption practices and misappropriation of resources.¹⁸¹ Holding consumers accountable requires consumers to internalize the costs of their consumption in the form of fees.¹⁸² Such fees may take the form of disposal fees based on the amount of trash a household produces; “advanced disposal fees,” which incorporate the disposal fee into the purchase price of the item purchased;¹⁸³ or container deposits, which may be refunded when the container is returned.¹⁸⁴

a. *Pay-As-You-Throw*

Regardless of trash output, residents typically pay for waste removal through property taxes or a fixed fee.¹⁸⁵ But many communities have begun treating waste collection like other utilities by charging households a variable rate based on the amount of garbage generated, a method called “Pay-As-You-Throw” (“PAYT”).¹⁸⁶ PAYT has been touted as “the secret to sustainable behavior change” by incentivizing consumers to internalize disposal costs.¹⁸⁷ Communities that have implemented PAYT have been better able to handle increased MSW generation, rising costs of

178. *Id.*

179. *Id.*

180. McCrea, *supra* note 109, at 516.

181. *Id.*

182. *Id.*

183. Incorporating the disposal fee into the purchase price disincentives illegal dumping in an effort to avoid fees. *Id.*

184. *Id.* Consumers may return containers to retail stores, redemption centers, or reverse vending machines to receive their deposit refund. *What is a Bottle Bill?*, BOTTLE BILL RES. GUIDE, www.bottlebill.org/about/whatis.htm (last visited Dec. 19, 2018). The retailer then recovers the deposit plus a “handling fee” ranging from one to three cents from the distributor. *Id.*

185. *Pay-As-You-Throw*, U.S. ENVTL. PROT. AGENCY, archive.epa.gov/wastes/conserve/tools/payt/web/html/index.html (last updated Feb. 21, 2016) [hereinafter EPA, *Pay-As-You-Throw*].

186. *Id.* The fee is typically based on number of bags or cans of waste, or by weight. *Id.*

187. Kristen Brown, *PAYT is SMART*, FORESTER DAILY NEWS (Nov. 1, 2010), foresternetwork.com/daily/waste/payt-is-smart/.

disposal, and uncertain MSW budgets.¹⁸⁸ Communities with a PAYT system generate half the waste and save on disposal costs compared to communities that have not implemented PAYT.¹⁸⁹ The EPA has endorsed PAYT programs for their ability to integrate environmental sustainability, economic sustainability, and equity.¹⁹⁰ The positive effects of PAYT programs include: increased recycling and reduced waste, which leads to resource conservation and GHG emission reduction; revenue generation, which can offset waste collection costs, including recycling; and fairness to residents.¹⁹¹

But PAYT programs vary by community.¹⁹² The most effective option involves the “bag” method where waste is disposed of in special bags.¹⁹³ An effective bag strategy incorporates the advanced disposal fee concept. The price of the bag includes the cost of the bag and the cost to collect and dispose of it.¹⁹⁴ In turn, revenue from the sale of the bags goes toward providing trash services.¹⁹⁵ The main concern for PAYT programs is illegal dumping and the impact on low-income residents.¹⁹⁶ But many PAYT communities have not encountered illegal dumping problems, especially because there are legal waste reduction options (such as recycling and composting) available.¹⁹⁷ Additionally, PAYT communities provide coupons or voucher programs to assist low-income residents with the expense.¹⁹⁸ In fact, PAYT and other bag-based programs are embraced by community residents who view the system as fair and affordable.¹⁹⁹

b. Bottle Bills

Beverage bottles comprise more than 80 percent of containers sold in the United States.²⁰⁰ But because beverages are often

188. U.S. ENVTL. PROT. AGENCY, EPA530-F-97-0007, PAY-AS-YOU-THROW SUCCESS STORIES 1 (1997).

189. Brown, *supra* note 187.

190. EPA *Pay-As-You-Throw*, *supra* note 185.

191. *Id.*

192. See *Pay-As-You-Throw 101*, WASTEZERO, wastezero.com/the-trash-problem/pay-as-you-throw-101/ (last visited Nov. 19, 2017) (differentiating between cash, variable rate cart, overflow, tag, and bag PAYT methods).

193. *Id.*

194. *Pay-As-You-Throw*, WASTEZERO, wastezero.com/our-solutions/pay-as-you-throw/ (last visited Nov. 19, 2017).

195. *Id.*

196. U.S. ENVTL. PROT. AGENCY, EPA530-F-96-028, PAY-AS-YOU-THROW: THROW AWAY LESS AND SAVE 2 (1997).

197. *Id.*

198. *Id.*

199. *Pay-As-You-Throw 101*, *supra* note 192. See also Brown, *supra* note 187 (praising PAYT programs throughout the country).

200. *Bottle Bill Frequently Asked Questions*, BOTTLE BILL RES. GUIDE, www.bottlebill.org/about/faqs.htm (last visited Oct. 28, 2017).

consumed and emptied away from home, they are not captured in curbside collection programs and are more likely to be littered.²⁰¹ Container deposit laws, or “bottle bills,” incentivize the recycling of aluminum, polyethylene terephthalate (PET) plastic,²⁰² and glass beverage containers, thereby reducing littering and landfilling.²⁰³ They increase the purchase price of the beverage by the deposit amount, but consumers are refunded the deposit upon returning the container.²⁰⁴

Though most states have proposed container deposit laws,²⁰⁵ only 10 states currently have beverage container deposit laws.²⁰⁶ Much like the curbside recycling programs discussed above, there is little uniformity in beverage container deposit laws amongst the states that have enacted them.²⁰⁷ Only three states have comprehensive bottle bills that include most PET beverage containers, whether they contain carbonated or noncarbonated drinks.²⁰⁸ Four states only include carbonated beverages.²⁰⁹ The remaining three states only include containers of carbonated beverages and water, ignoring other non-carbonated beverage containers.²¹⁰

From 2000 to 2010, beverage container recycling remained constant at 39 percent.²¹¹ However, rates in states with beverage container deposits doubled and sometimes tripled the rate of states without such deposits.²¹² Moreover, despite the states with bottle bills only comprising 28 percent of the population, they were

201. *Bottle Bill Frequently Asked Questions*, *supra* note 200. Plastic bottles make up 40 percent to 60 percent of litter. *Id.*

202. Many product containers are made out of PET: beverage bottles, shampoo bottles, honey bottles, soap bottles, peanut butter jars, salad dressing, etc. but only beverage bottles qualify for the deposit program. *See PET Bottles*, U. S. PLASTIC CORP., www.usplastic.com/catalog/default.aspx?catid=678 (last visited Oct. 29, 2017) (selling various types of PET bottles).

203. *Bottle Bill Frequently Asked Questions*, *supra* note 200.

204. W. Kip Viscusi et al., *Discontinuous Behavioral Responses to Recycling Laws and Plastic Water Bottle Deposits*, 15 AM. L. ECON. REV. 110, 121 (2013).

205. *Proposed Laws*, BOTTLE BILL RES. GUIDE, www.bottlebill.org/legislation/campaigns.htm (last visited Oct. 29, 2017).

206. Schultz, *supra* note 49 and accompanying text.

207. *See Bottle Bills in the USA: All US Bottle Bills*, BOTTLE BILL RES. GUIDE, www.bottlebill.org/legislation/usa/allstates.htm (last visited Jan. 28, 2018) (differentiating state bottle bills by various categories including beverages covered, containers covered, and deposit amounts).

208. JENNY GITLITZ, CONTAINER RECYCLING INSTITUTE, *BOTTLED UP: BEVERAGE CONTAINER RECYCLING STAGNATES (2000-2010)* 9 (2013). These states are California, Hawaii, and Maine. *Id.*

209. *Id.* The carbonated-only states are Michigan, Iowa, Massachusetts, and Vermont.

210. *Id.* The water-inclusive states are Oregon, New York, and Connecticut. *Id.*

211. *Id.* at 8.

212. *Id.* States with container deposit laws had recycling rates of 66 percent to 96 percent whereas those without had a recycling rate of 30 percent. *Id.* at 9.

responsible for recycling almost half of the containers recycled in 2010.²¹³ Between 2000 and 2010, non-alcoholic sales growth consisted entirely of non-carbonated beverages, with bottled water sales (which contributed the majority of the growth) quadrupling.²¹⁴ It makes sense then, that bottle bills that allow refunds for deposits on water bottles increase water bottle recycling by two out of ten water bottles.²¹⁵

Container deposits are so effective at recovering containers for recycling that instituting a 5-cents deposit on all carbonated and non-carbonated beverages nationwide would probably cause the bottle recycling rate to skyrocket to 75 percent.²¹⁶ If the deposit was 10-cents, recycling would further increase to 80 percent or even 90 percent.²¹⁷ But, so far, national bottle bill legislation has been unsuccessful.

In 2003, the National Beverage Producer Responsibility Act of 2003 was proposed as an amendment to the SWDA to incentivize recycling by providing 10 cents deposit refunds for beverage containers, whether alcoholic or non-alcoholic, carbonated or non-carbonated, with the exception of dairy.²¹⁸ However, the act failed to make it past its referral to the Senate Committee on Environment and Public Works.²¹⁹ Similarly, the Bottle Recycling Climate Protection Act of 2009, which would require a 5-cents deposit, saw no further action after being referred to the House Committee of Energy and Commerce.²²⁰ The bill was reintroduced in 2012, but again was referred to the House Committee of Energy and Commerce with no further action.²²¹

Much of the pushback against bottle bills is because the deposit is viewed as a tax.²²² Additionally, Keep America Beautiful (“KAB”), though seemingly an environmental organization, was created in 1953 by the packaging and container industries to prevent legislation restricting package manufacturing.²²³ It was KAB that

213. *Id.* at 16.

214. *Id.* at 12.

215. Viscusi et al., *supra* note 204, at 128.

216. GITLITZ, *supra* note 208, at 21.

217. *Id.*

218. National Beverage Producer Responsibility Act of 2003, S. 1867, 108th Cong. (2003).

219. *Id.*

220. Bottle Recycling Climate Protection Act of 2009, H.R. 2046, 111st Cong. § 12001(1) (2009); PUBLIC BILLS AND RESOLUTIONS, 155 CONG. REC. H. 4685, 4686 (2009).

221. Bottle Recycling Climate Protection Act of 2012, H.R. 6531, 112nd Cong. (2012); PUBLIC BILLS AND RESOLUTIONS, 158 CONG. REC. H. 6273, 6275 (2012).

222. Katherine Boyle, *New Bottle Deposit, Bag Tax Bills Touted for Combatting Pollution*, N.Y. TIMES (Apr. 23, 2009), www.nytimes.com/gwire/2009/04/23/23greenwire-new-bottle-deposit-and-bag-tax-bills-touted-for-10641.html.

223. Robin Nagle, *Politics of Waste*, in 2 ENCYCLOPEDIA OF CONSUMPTION

shifted the responsibility of product waste from manufactures to consumers through its slogan, “People start pollution; people can stop it.”²²⁴ KAB is a major opponent of container deposit laws, despite the effectiveness of the legislation.

C. Recycling Practices of an Industry Leader

Germany has one of the most successful recycling campaigns in the world, recycling over 66 percent of its MSW.²²⁵ Much of its success is attributed to the prevalence – and number – of collection bins.²²⁶ Waste is collected in six color-coded bins:²²⁷ black (or grey)²²⁸ for general waste, blue for paper and cardboard, yellow for plastic and packaging materials, white for clear glass, green for colored glass, and brown for organics composting.²²⁹ By pre-sorting recycling, Germany saves money and reduces contamination of recycling product.²³⁰ Furthermore, the waste pickup schedule prioritizes recycling over landfilling: food waste is collected weekly, paper and packaging (blue and yellow bins) are collected every other week, and garbage is collected monthly.²³¹ Germany also employs a container deposit system for glass, aluminum, and plastic beverage containers, with a recovery or redemption rate of over 96 percent.²³² The high capture rate is largely due to deposit bottles being unrecyclable.

The national Government, Federal States, and local authorities all share responsibility for Germany’s waste management.²³³ The National Ministry of Environment sets standards and goals, and drafts national legislation, which Federal

AND WASTE *supra* note 32, at 678.

224. *Id.* One of the early spokespeople for the campaign was Ronald Reagan, then a “relatively unknown” actor. *Id.*

225. Brian Brassaw, *Germany: A Recycling Program That Actually Works*, EARTH911 (July 11, 2017), earth911.com/business-policy/recycling-in-germany/.

226. Melissa Eddy, *Germany Gleefully Leads List of World’s Top Recyclers*, N.Y. TIMES (Nov. 28, 2016), www.nytimes.com/2016/11/28/world/what-in-the-world/germany-gleefully-leads-list-of-worlds-top-recyclers.html.

227. Sometimes colored bags are used in lieu of bins. American Women’s Club of Cologne, *All About Recycling in Germany*, HOW TO GER., www.howtogermany.com/pages/recycling.html (last visited Nov. 19, 2017).

228. *Id.*

229. *E.g.* Brassaw, *supra* note 225 (describing the what materials go in each bin). *See also* Eddy, *supra* note 226 (expanding slightly on materials that can be recycled in the various bins).

230. Eddy, *supra* note 226.

231. *Waste Management in Germany, 87% Recycling Rate*, WE FUTURE RECYCLE (July 15, 2015), wefuturecycle.com/2015/07/15/waste-management-in-germany-87-recycling-rate/.

232. *Beverage Container Legislation Around the World: Germany*, BOTTLE BILL RES. GUIDE, www.bottlebill.org/legislation/world/germany.htm (last visited Nov. 19, 2017).

233. N. IR. ASSEMBLY, NIAR 485-16, RECYCLING IN GERMANY, at 3 (2017).

States use to implement regional waste management plans.²³⁴ The local authorities are responsible for collecting and transporting waste, and constructing and operating disposal facilities.²³⁵ Germany has a waste hierarchy, similar to the United States' Sustainable Materials Management hierarchy, that prioritizes waste prevention, reuse, and recycling (including energy recovery) above disposal.²³⁶ However, Germany has demonstrated its commitment to the hierarchy through its implementation of measurable waste management initiatives.²³⁷ Additionally, Germany continuously sets goals to keep waste management on track.²³⁸

D. Recycling Roadblocks

1. Doubts as to Recycling's Effectiveness

In the 1990s, there was a landfill crisis; today, is there a recycling crisis? Some economists dispute the effectiveness of recycling, arguing that even after considering the sale of recycled material and the increased space available in landfills by diverting recyclables, it is still cheaper to landfill recyclable materials.²³⁹ Recycling is like any commodity; it is expected to fluctuate.²⁴⁰ It is also expected to adapt and rebound.²⁴¹

Glass, a material commonly associated with recycling, is difficult to recycle in a cost-effective way.²⁴² The actual process of recycling glass is straightforward but tends to result in a loss of \$300 per ton recycled.²⁴³ Contamination and a limited market for glass forces many recycling centers to pay to offload the glass they

234. *Id.*

235. *Id.*

236. *Waste Management in Germany*, UMWELTBUNDESAMT (Jan. 20, 2014), www.umweltbundesamt.de/en/topics/waste-resources/waste-management.

237. See Brassaw, *supra* note 225 (describing Germany's waste management initiatives that have contributed to the country's recycling success).

238. See *Waste Management – What is Important to Know?*, FED. MINISTRY FOR THE ENV'T, NATURE CONSERVATION, BLDG. AND NUCLEAR SAFETY, www.bmu.de/en/topics/water-waste-soil/waste-management/waste-management-what-is-important-to-know/ (last updated July 7, 2017) (setting Germany's latest goal at achieving “almost complete high-quality recovery, of municipal waste at least, by 2020”).

239. Héctor R. Reyes, *Sustainable Waste Management*, in 2 *ENCYCLOPEDIA OF CONSUMPTION AND WASTE* *supra* note 32, at 890.

240. Luke Whelan, *4 Big Recycling Myths Tossed Out*, MOTHER JONES (July 13, 2015), www.motherjones.com/environment/2015/07/recycling-myths-blue-bins/.

241. *Id.*

242. Michele Nestor, *Can We Rescue Glass Recycling?*, WASTE360 (Feb. 4, 2016), www.waste360.com/glass/can-we-rescue-glass-recycling.

243. Sarah Laskow, *Who Will Pay America's \$1.5 Billion Recycling Bill?*, NEXT CITY (Feb. 9, 2015), nextcity.org/features/view/cost-of-recycling-america-extended-producer-responsibility-cities.

produce.²⁴⁴ Moreover, the weight of glass makes it expensive to transport.²⁴⁵

Landfilling glass, on the other hand, has fewer environmental risks because glass does not decompose and therefore does not release any gas or produce contaminants.²⁴⁶ Recycling glass also has environmental benefits. The 37 percent of glass that was recycled in 2010 had energy equivalent savings of 7.5 trillion BTUs²⁴⁷ and prevented one million tons of GHG emissions.²⁴⁸ When containers are “wasted” (e.g. landfilled), they must be replaced with a container made from virgin materials.²⁴⁹ It costs 13 trillion BTUs, which could have powered almost 150 thousand homes for a year, to replace wasted glass.²⁵⁰ Replacing wasted glass also results in approximately 1.7 million tons of GHG emissions.²⁵¹

Skeptics further argue that MSW only contributes three percent of the United States’ total waste and even 100 percent diversion would have, at most, a minimal impact due to the small ratio.²⁵² However, as more and more states move toward a zero-waste mentality, there is potential to “radically increase environmental benefits.”²⁵³ Zero waste systems reimagine current waste disposal systems and resource use to develop better systems.²⁵⁴ The new systems use waste, rather than natural resources, to create new products, which generates less pollution and grows the local economy.²⁵⁵ “Reducing, redesigning, reusing, refilling, regenerating, recycling, repairing, reclaiming, refurbishing, restoring, recharging, remanufacturing, reselling, deconstruction, and composting” are all elements of zero waste, and each works to prevent waste from being landfilled or otherwise pollute the environment.²⁵⁶

244. Will Flower, *Focusing on the Economics of Glass Recycling*, WASTE360 (Oct. 1, 2015), www.waste360.com/glass/focusing-economics-glass-recycling.

245. *Id.*

246. *Id.*

247. The annual amount of energy used by almost 84 thousand homes. GITLITZ, *supra* note 208, at 28. “BTU” means British thermal unit and is used to measure “the heat content of fuels or energy sources. U.S. Energy Info. Admin., *British Thermal Units (Btu)*, U.S. DEP’T OF ENERGY, www.eia.gov/energyexplained/index.php?page=about_btu (last updated Aug. 8, 2018). One BTU equals the “energy released by burning a match.” *Id.*

248. *Id.* at 19.

249. *Id.* at 20.

250. *Id.* at 19.

251. *Id.*

252. Nagle, *supra* note 223, at 682.

253. Liboiron, *supra* note 32, at 738.

254. ECO-CYCLE, *supra* note 80.

255. *Id.*

256. Michael Jessen, *The Ripple Effect of Zero Waste*, RECYCLING COUNCIL OF B.C., www.rcbc.ca/resources/articles (last visited Dec. 20, 2018).

2. Political Hindrance

Another barrier to comprehensive recycling legislation is the current political climate. As the political right began to gain governmental power, pressure for waste disposal policies was also increasing.²⁵⁷ The Republican Party is not known for its environmental progressiveness, and with control of the White House and Congress during George W. Bush's presidency, legislation was, unsurprisingly and unfortunately, unlikely.²⁵⁸ For over 15 years, no major environmental legislation had been passed.²⁵⁹ The nation is now in a similar, but more extreme situation under the Trump Administration, which serves as a major hurdle for progressive, Earth-saving legislation.²⁶⁰

Thus, proponents may have to set aside the environmental benefits of recycling and focus on the economic benefits. For every 1000 tons of materials recycled, 1.57 jobs are created and \$14,101 are collected in tax revenue.²⁶¹ More recycling activity will lead to more jobs and more revenue. It is time for Congress to realize the economic impact of recycling that it recognized²⁶² over fifty years ago when it created the SWDA. If the United States is to keep up with, much less lead, other nations in recycling rates, citizens must channel their inner Gaylord Nelson and rally for change.²⁶³

3. China's Ban on Imported Recycling

China is the world's largest importer of recyclable materials, but in July 2017, it announced a ban on importing 24 types of materials including paper and plastic.²⁶⁴ The purpose of China's ban is to crack down on pollution.²⁶⁵ There is too much contamination (both hazardous and nonhazardous) in imported recyclable material

257. Sachs, *supra* note 80, at 87.

258. *Id.*

259. *Id.*

260. *E.g.* Chloe Farand, *COP23: UN Summit Shows How Donald Trump is Doing More Damage to World's Climate Than We Ever Realised*, INDEPENDENT (Nov. 18, 2017), www.independent.co.uk/news/world/politics/cop23-un-climate-change-summit-bonn-donald-trump-paris-agreement-us-pope-francis-a8061256.html (discussing the effect of President Trump's withdrawal from the Paris Agreement and noting that the United States is the only country not contributing to the global effort to combat climate change).

261. U.S. ENVTL. PROT. AGENCY, *supra* note 94, at 6.

262. 42 U.S.C. §6901(c) (1965).

263. *See generally* McCarthy, *supra* note 16 (ranking the United States 18th in percentage of MSW recycled and composted).

264. Anna Johansson, *How is China's Recycling Ban Affecting U.S. Cities?*, EARTH911 (Feb. 6, 2018), earth911.com/business-policy/china-ban-cities/; Eric Roston, *Why iPhones are Being Recycled and Bottles Aren't*, BLOOMBERG BUSINESSWEEK (Jan. 28, 2018), www.bloomberg.com/news/articles/2018-01-29/why-iphones-are-being-recycled-and-bottles-aren-t-quicktake-q-a.

265. *Id.*

resulting in an inability to reuse it.²⁶⁶ Current contamination levels in the United States are about 25 percent.²⁶⁷ China now requires the contamination level to be down to 0.3 percent.²⁶⁸

The United States exports close to one-third of its recycling, and nearly half of it went to China.²⁶⁹ Now, recycling companies are struggling to fill the gap. Some companies have found other countries to import recycling, but not to the degree that China previously did.²⁷⁰ Other companies are becoming more stringent or looking for other ways to comply with China's strict standards.²⁷¹ Worst of all, some are landfilling their recyclable materials because there is nowhere else to put them.²⁷² In the words of an Oregon recycling company employee, "[recycling] has no value. There is no demand for it in the marketplace. It's garbage."²⁷³ Hope is not lost. Some states are working to develop domestic markets for materials.²⁷⁴ Some cities are tackling the issue on the front end by enforcing plastic bag bans.²⁷⁵

While China's recycling import ban severely impacts the United States' recycling industry, the recycling industry should not bear the burden of the consequences alone. Environmentalists

266. *Id.* A common contaminant of recycling is food remnants (i.e. a greasy pizza box). Rayne Ellis, *Recycling in the United States is in Serious Trouble. How Does it Work?*, MASHABLE (Aug. 18, 2018), mashable.com/2018/08/18/how-recycling-works/#gz6L_y3qmqR. Contaminants interfere with the refining process used in recycling materials. *Id.*

267. *Id.* One out of four items in the recycling bin belongs in the trash. *Id.*

268. *Id.*

269. Cassandra Profita & Jes Burns, *Recycling Chaos in U.S. as China Bans 'Foreign Waste'*, NPR (Dec. 9, 2017, 8:00 AM), www.npr.org/2017/12/09/568797388/recycling-chaos-in-u-s-as-china-bans-foreign-waste.

269. Johansson, *supra* note 264.

270. Johansson, *supra* note 264.

271. Recycling companies may supply a separate bin for paper only, add cameras to collection trucks to monitor trash in recycling bins. Profita & Burns, *supra* note 269. Some are even considering robotic solutions to sorting recyclable materials. *Id.*

272. Profita & Burns, *supra* note 269.; Liz Greene, *China's Recycling Ban: What Do We Do with Our Plastics Now?*, EARTH911 (Mar. 15, 2018), earth911.com/business-policy/china-ban-plastics/.

273. *Id.*

274. See Cody Boteler & Cole Rosengren, *What Chinese Import Policies Mean for All 50 States*, WASTE DIVE, www.wastedive.com/news/what-chinese-import-policies-mean-for-all-50-states/510751/ (last updated Apr. 3, 2019) (tracking the impact of China's recycling ban on each of the 50 states). Waste Management, the largest waste company in the United States, has already been creating domestic markets for its plastic and felt little impact from the ban. Adele Peters, *China Doesn't Want Our Trash Anymore, So We Need to Recycle Smarter*, FAST CO. (Dec. 15, 2017), www.fastcompany.com/40507352/china-doesnt-want-our-trash-anymore-so-we-need-to-recycle-smarter. Seventeen paper mills in the United States and Canada have pledged "to expand their capacity to use recycled paper." Chaz Miller, *2018: A Dramatic Year for Recycling*, WASTE360 (Dec. 17, 2018), www.waste360.com/recycling/2018-dramatic-year-recycling.

275. Johansson, *supra* note 264.

argue that this problem calls for more proactive production and consumption measures, rather than reactive waste management and recycling strategies.²⁷⁶ Others are hopeful that China's ban will catalyze more progressive disposal and recycling systems throughout the world.²⁷⁷ In 2016, the United States paid China \$5.6 billion to recycle its waste.²⁷⁸ Because China does not accept major materials like plastic, the United States can reinvest the money into its own recycling initiatives.

IV. PROPOSAL

This section proposes solutions for the United States to increase its recycling rate. First, it recommends expanding the Sustainable Materials Management framework to incorporate effective MSW recycling initiatives used by U.S. cities and other countries. Next, it suggests national strategies aimed at boosting the United States' recycling rate to demonstrate that the U.S. can be an industry leader in recycling.

A. *Sustainable Materials Management Revisited*

The EPA's four-year SMM plan does not specifically aim to minimize waste impact through MSW recycling.²⁷⁹ Yet, MSW recycling has the potential to greatly affect the way the United States handles waste. It can also reduce GHG emissions and protect the environment.²⁸⁰ Increased MSW recycling should be an objective in the next fiscal period's strategic plan, to not only recover resources, but also to recover revenue.

State and local governments, and some foreign governments, have set their own recycling goals. It is important, however, that the success of cities, like San Francisco, that are making great strides in high-rate recycling, serve as a motivator for other cities and the nation, rather than an excuse not to contribute to the recycling effort.²⁸¹ This is because research indicates that recycling rates over 80 percent will significantly slow the depletion of natural resources.²⁸² Therefore, the EPA should set national recycling goals

276. Roston, *supra* note 264. The plethora of recycling that is being stored or landfilled is a result of consumers buying too much stuff and manufactures for producing single-use products or products made to last for only a couple years. *Id.*

277. Profita & Burns, *supra* note 269.

278. Peters, *supra* note 274.

279. See U.S. ENVTL. PROT. AGENCY, *supra* note 10 (outlining the objectives of the SMM strategic plan for 2017-2022).

280. Worland, *supra* note 83.

281. Dr. Steffen Lehmann, *Resource Recovery and Materials Flow in the City: Zero Waste and Sustainable Consumption as Paradigms in Urban Development*, 11 SUSTAINABLE DEV. L. & POL'Y 28, 29 (2010).

282. *Id.*

for the United States, and these goals should be regularly updated. Recycling goals should follow the SMART strategy and be specific, measurable, attainable, relevant, and time-based.²⁸³ Using these criteria, the EPA can develop an actionable plan to incorporate into the next SMM plan.

The EPA (and other organizations) should also consistently evaluate waste disposal strategies. Recycling and composting data should be separated to more accurately depict each method's effectiveness, ultimately contributing to the "measurable" element of a SMART goal. Composting data inflates the touted recycling rate,²⁸⁴ which may contribute to the lack of recycling initiative throughout the nation because the rate is perceived to be higher than it is. With more accurate data, more effective measures can be taken to strengthen the waste management approach. It will be clear how the nation is progressing to reach the goals that it sets and evident whether the strategies in place are effective.

B. National Recycling Initiative

Some cities in the United States have developed successful recycling programs, but progressive recycling efforts are concentrated on the East and West Coasts, with a few programs sprinkled throughout the middle of the country.²⁸⁵ Nationwide implementation would have a more profound effect and improve the United States' recycling and waste management reputation. The federal government has the authority to legislate recycling, and, like Germany, it can do so broadly while leaving more specific implementation strategies to the states.²⁸⁶ National recycling legislation would fill the "large void of state leadership" found in non-coastal states.²⁸⁷

1. Curbside Recycling

Studies have shown automatic curbside recycling programs are more effective at capturing recycling than opt-in or subscription-based programs by almost 100 pounds of recycling per household per year.²⁸⁸ Moreover, implementation is relatively easy because the collection method, whether public or private, single- or dual-

283. Darrell Zahorsky, *5 Elements of a SMART Business Goal*, THE BALANCE, www.thebalance.com/elements-of-a-smart-business-goal-2951530 (last updated Jan. 8, 2018).

284. U.S. ENVTL. PROT. AGENCY, *supra* note 13.

285. Kate Bailey, *Zero Waste for the Rest of Us*, WASTE360 (June 22, 2017), www.waste360.com/waste-reduction/zero-waste-rest-us. "Households on the coasts recycle significantly more pounds per person than in the middle of the country." *Id.*

286. N. IR. ASSEMBLY, *supra* note 233.

287. Bailey, *supra* note 285.

288. THE RECYCLING P'SHIP, *supra* note 78, at 19.

stream,²⁸⁹ cart or bin, does not matter.²⁹⁰ The city need only bundle recycling collection with garbage collection for recycling programs that are currently opt-in or subscription-based.²⁹¹

To offset the high economic burden of recycling access, rural communities can be included through the “hub and spoke” method already in place for garbage collection.²⁹² Public and private operations could work together to expand their reach and increase efficiency.²⁹³ The hub and spoke strategy allows residents in rural communities who want to recycle a financially feasible recycling option.²⁹⁴ Simultaneously, the consolidation of materials from the spokes create enough volume for the hubs to process and market the material in an economically feasible way.²⁹⁵ This method can also be used to collect hard-to-recycle materials such as electronics, mattresses, and Styrofoam.²⁹⁶

2. Landfill Bans

Uniform landfill bans will provide waste generators with standards for what can, and must, be recycled. However, uniform landfill bans do not necessarily have to apply all landfills. Implementing specific criteria for materials banned from certain types of landfills should reduce the confusion for solid waste disposal facilities and haulers through standardization.²⁹⁷ Landfill

289. There is much debate over whether single or dual stream recycling has greater benefits. Rick LeBlanc, *Single and Dual Stream Recycling*, THE BALANCE, www.thebalance.com/single-and-dual-stream-recycling-2877722 (last updated Jan. 1, 2019). On the one hand, single stream recycling is desirable for consumers because they need only put all recyclable materials in one container – it is less effort. *Id.* But dual stream recycling reduces the potential for contamination, resulting in higher quality recovery. *Id.*

290. THE RECYCLING P'SHIP, *supra* note 78, at 19.

291. *Id.*

292. *Id.* at 20.

293. SCS ENG'RS, *supra* note 150, at 41.

294. See ABC4 News, *supra* note 143 (explaining that residents of rural communities in Utah “want to do the right thing, they want to recycle and they think it should just be a given everywhere”). See also Valerie Bauerlein, *Recycling Vexes Rural Areas*, WALL STREET J. (Jun 17, 2014), www.wsj.com/articles/recycling-vexes-rural-areas-1403050978 (stressing the difficulties of providing recycling in rural communities, such as in Lynn Haven, Florida, where “[p]eople want recycling, [b]ut it doesn’t make financial sense”).

295. Szczepanski, *supra* note 147. The estimated value of Iowa’s recoverable materials that were instead landfilled in 2016 is estimated to be \$60 million. Arlene Karidis, *Results from Iowa Waste Characterization Study Jump-Start Diversion Conversations*, WASTE360 (Jan. 18, 2018), www.waste360.com/waste-reduction/results-iowa-waste-characterization-study-jump-start-diversion-conversations.

296. Bailey, *supra* note 285

297. There are three types of landfill bans implemented throughout the world: bans based on waste source, bans based on waste type, and bans based on waste properties. ELEANOR DAWKINS & PETER ALLAN, DEPT OF SUSTAINABILITY, ENV'T, WATER, POPULATION AND CMTYS.: LANDFILL BAN

bans can also serve as starting points for mandatory recycling legislation. Requiring recycling of items prohibited from landfills is the logical next step to increasing recycling output.

Landfill operators may object and point out that separate collection of banned materials (such as yard waste) requires more haulers, which emit greenhouse gases.²⁹⁸ After all, fewer trucks mean less fuel and fewer fees.²⁹⁹ However, banning certain materials from landfills saves landfill space and extends the life of the landfill.³⁰⁰ Through the demand for landfill bans, Lincoln, Nebraska learned that this method of waste management is “not only good for our environment, it is good for our city’s bottom line.”³⁰¹

3. Mandatory Recycling

Like landfill bans, mandatory recycling does not need to apply to everyone or every material. Many cities with mandatory recycling use a “meet-in-the-middle” strategy that applies to businesses and apartment complexes, but not individual households.³⁰² This approach can serve as a starting point for increasing the nation’s recycling rate. It can also assuage individuals with the rebellious mentality that they do not want to be told what to do, even if they participate in the activity voluntarily.³⁰³ State and local governments can have the option to mandate recycling among households, but eventually, as a culture of recycling is cultivated, the goal is to incorporate single-family residences nationally.

INVESTIGATION 7 (2010). Waste source bans use the waste stream (e.g. MSW, commercial waste, or construction and demolition waste) to define the ban. *Id.* Waste type bans identify a particular material and are typically coupled with a level of “recoverability”. *Id.* Waste property bans are based on physical or biological properties of the waste (e.g. combustibility). *Id.*

298. Rachael Zimlich, *Why Iowa Overturned its Ban on Landfilling Yard Waste*, WASTE360 (July 21, 2015), www.waste360.com/yard-waste/why-iowa-overturned-its-ban-landfilling-yard-waste.

299. *Id.* Iowa’s overturn of its yard waste ban is expected to save \$2 million. *Id.* But the overturn also caused a shortage of compost. Emma Husar, *More Initiative Will Kick in to Reduce Waste Going into the Iowa City Landfill*, LITTLE VILLAGE (Aug. 16, 2017), littlevillagemag.com/more-initiatives-will-kick-in-to-reduce-waste-going-into-the-iowa-city-landfill/.

300. Nancy Hicks, *City Will Ban Cardboard at Landfill*, LINCOLN J. STAR (Jan. 20, 2017), journalstar.com/news/local/govt-and-politics/city-will-ban-cardboard-at-landfill/article_b4bca420-ee7c-5730-a623-3817cd3813dc.html.

301. *Id.* Residents of Lincoln, Nebraska petitioned to get the mayor’s original landfill ban, which would ban paper products such as cardboard and newspaper from landfills, on the city ballot. *Id.* Newcomers to the city “were surprised that [it] did not have a well-established recycling program.” *Id.*

302. Everson, *supra* note 177.

303. See Michael Munger, *The Economic Case Against Mandatory Recycling*, TIME (Oct. 21, 2015), time.com/collection-post/4058368/michael-munger-should-recycling-be-mandatory/ (explaining that he voluntarily recycles but does not want to be required to recycle).

The biggest hurdle to mandatory recycling is the prospective cost. Recycling seems to be less cost-effective than landfilling.³⁰⁴ This view is what prompted New York City to suspend its glass and plastic recycling in 2002.³⁰⁵ The city expected the cut to save \$40 million, but quickly discovered that recycling was more cost-effective, and restored its full recycling program within a year and a half.³⁰⁶ Just as impressively, Seattle's mandatory paper and bottle recycling saved the city \$200 million in landfill fees.³⁰⁷

4. *Bottle Bill*

It is time for a national bottle bill, particularly one that includes non-carbonated beverages.³⁰⁸ The groundwork has already been laid by the National Beverage Producer Responsibility Act of 2003 and Bottle Recycling Climate Protection Act of 2009 and 2012. As the proposed bills point out, a nationwide system of container recycling "is consistent with the intent of the SWDA."³⁰⁹ Moreover, container deposits complement curbside recycling, ensuring maximum landfill diversion and material recovery.³¹⁰

States that have combined deposits with curbside programs saw beverage container recycling rates increase by more than two and half times curbside only programs.³¹¹ Bottle bills are demonstrably successful at increasing recycling, and the projected effect of a nationwide bill makes it worthy of implementation.³¹² Previously proposed national bills allow exemptions for states that already have beverage container deposits, meet minimum beverage container deposit standards, or have a law requiring 70 percent recovery rate.³¹³

If people think the deposit is a tax, there will be strong opposition, thus, public education about the bottle bill will be key

304. *Id.*

305. MARK IZEMAN & VIRALI GOKALDAS, *RECYCLING RETURNS* iv (2004).

306. *Id.*

307. Mayor Ed Murray, *The Benefits of Compulsory Recycling Programs*, TIME (Oct. 21, 2015), time.com/collection-post/4075286/seattle-recycling/.

308. GITLITZ, *supra* note 208. See also *Quotes from Bottle Bill Supporters*, BOTTLE BILL RES. GUIDE, www.bottlebill.org/about/benefits/support-quotes.htm (last visited Nov. 19, 2017) (quoting the owner of Mountaintown Spring Water, Andrew Swandander's, support for expanded bottle bills as he laments about seeing his bottled water products littered and notes that carbonated beverages are not littered).

309. Bottle Recycling Climate Protection Act of 2012, H.R. 6531, 112nd Cong. §2(9) (2012).

310. *Bottle Bills Complement Curbside Recycling Programs*, BOTTLE BILL RES. GUIDE, www.bottlebill.org/about/benefits/curbside.htm (last visited Nov. 19, 2017). Deposit programs only target beverage containers, whereas curbside recycling programs include other recyclable containers. *Id.*

311. *Id.*

312. GITLITZ, *supra* note 208, at 21.

313. H.R. 6531, *supra* note 221, at §12007.

for enactment.³¹⁴ It must be made abundantly clear to both citizens and lawmakers that a container deposit is not a tax.³¹⁵ Deposit systems are funded by beverage producers and consumers, rather than by taxpayers alone.³¹⁶ The dual funding serves to reduce the container recovery cost per unit.³¹⁷ The city of Seattle, Washington, after implementing a bottle bill, discovered that it would not significantly impact City costs, and the additional diverted materials would save the city \$237,000 to \$633,000.³¹⁸ Consumers are incentivized to claim the deposit refund by returning containers, but unclaimed deposits provide revenue to state governments.³¹⁹

Meanwhile, Iowa lawmakers debate the future of the state's bottle bill.³²⁰ The main argument against the deposit is that curbside recycling programs decrease participation in the deposit redemption.³²¹ But 30 percent of Iowans want to keep the law, and 27 percent favor expansion to include juice and water bottles.³²² The program still has strong participation³²³ and though participation has declined, the unclaimed deposits contribute to Iowa's revenue.³²⁴

Diverted material savings combined with unclaimed deposit revenue should provide enough economic incentive for legislators to support a national bottle bill. But, the public also strongly supports a bottle bill.³²⁵ Since 1989, over 70 percent of U.S. Americans have supported bottle bills either nationwide or in their state.³²⁶ Container deposits also have industry support, with companies such as the Aluminum Association and the Glass Packaging Institute acknowledging that bottle bills would help them reach their

314. See e.g. *Bottle Bill Myths and Facts*, BOTTLE BILL RES. GUIDE, www.bottlebill.org/about/mythfact.htm (last accessed Jan. 10, 2019) (debunking myths about container deposit system and supplying factually accurate information).

315. Boyle, *supra* note 222.

316. BOTTLE BILL RES. GUIDE, *supra* note 310.

317. *Id.* The net cost per unit in deposit states was 53¢ compared to \$1.25 in non-deposit states.

318. *Id.*

319. Susan Haigh, *Several States Consider Tossing Bottle Deposit Programs*, SEATTLE TIMES (Apr. 25, 2017), www.seattletimes.com/business/bottle-redemption-programs-on-statehouse-chopping-blocks/. In Connecticut, that means an additional \$34 million each year. *Id.*

320. Brianne Pfannenstiel, *Lawmakers Continue to Debate Future of Iowa's "Bottle Bill" Without Resolution*, DES MOINES REG. (Mar. 20, 2018), www.desmoinesregister.com/story/news/politics/2018/03/20/lawmakers-continue-debate-future-iowas-bottle-bill-without-resolution/442697002/.

321. *Id.* Participation is down to 71 percent from 86 percent in 2007. *Id.*

322. *Id.*

323. *Id.*

324. See Haigh, *supra* note 319 (explaining that unclaimed deposits create revenue for the state).

325. *Opinion Polls*, BOTTLE BILL RES. GUIDE, www.bottlebill.org/about/benefits/support-polls.htm (last visited Nov. 19, 2017).

326. *Id.*

recycling targets.³²⁷

5. *Pay-As-You-Throw*

The federal government should seek to effectuate societal changes in behavior toward recycling, like that which is now present in Germany.³²⁸ As previously noted, Pay-As-You-Throw (“PAYT”) programs have been praised as capable of creating such behavioral change.³²⁹ Those who previously did not care about their waste habits have a new attitude post-PAYT implementation.³³⁰ PAYT positively influences consumer purchasing behavior and provides direct economic payback to consumers.³³¹ Cities that have implemented PAYT programs have found it to be “win-win,” resulting in both an increased recycling rate and economic stability.³³² The program can also subsidize the cost of waste disposal.³³³

The biggest concern with PAYT implementation is that requiring residents to pay for their waste disposal could increase illegal dumping.³³⁴ In most communities with PAYT programs, however, this has not been the case, especially when there are other legal disposal and recycling options.³³⁵ Coupons or vouchers can subsidize the cost in low-income communities.³³⁶ Thus, PAYT is a realistic option for nationwide implementation.

V. CONCLUSION

Recycling has a long history in the United States. Over the past

327. *Industry support for Bottle Bills*, BOTTLE BILL RES. GUIDE, www.bottlebill.org/about/benefits/support-industry.htm (last visited Nov. 19, 2017).

328. Germans are not legally obligated to sort their waste, but it has become so ingrained in their way of life, they often correct other who are not recycling properly. Marie Look, *Trash Planet: Germany*, EARTH911 (July 13, 2009), earth911.com/earth-watch/trash-planet-germany/.

329. Brown, *supra* note 187.

330. Christina DiMartino, *Does Pay-As-You-Throw Pay Off?*, WASTE360 (June 1, 2000), www.waste360.com/mag/waste_payasyou_throw_pay.

331. U.S. ENVTL. PROT. AGENCY, *Paying for Waste Disposal*, U.S. ARCHIVE DOCUMENT, archive.epa.gov/wastes/consERVE/tools/payt/web/pdf/benefits.pdf (last visited Jan. 23, 2018).

332. *Id.* at 13. A study in Colorado found that, on average, communities with PAYT programs generated 49 percent less waste than communities without the program. KATE BAILEY & DANNY KATZ, *THE STATE OF RECYCLING IN COLORADO 10* (2017).

333. NE. MICH. COUNCIL OF GOV'TS, *RECYCLING IN MICHIGAN: SUCCESSFUL RECYCLING PROGRAMS, BEST PRACTICES, AND DIVERSION POTENTIAL 50* (2016). The City of Grand Rapids' collection of garbage and yard waste is fully funded by PAYT user fees. *Id.*

334. U.S. ENVTL. PROT. AGENCY, *supra* note 196.

335. *Id.*

336. *Id.*

few decades, the country's recycling rate has plateaued.³³⁷ The United States has fallen behind many nations and has barely exceeded the global recycling rate average.³³⁸ Though recycling has demonstrated environmental benefits, if monumental change is expected under the current administration, advocates may have better luck promoting the economic initiatives of recycling programs.

The United States has the potential to significantly increase its recycling rate and many options to begin the process. A national recycling initiative does not mean there will be extensive government intrusion. The federal government can merely provide the guidelines (in a more effective way than it currently does now) for state and local governments to implement and enforce.

With a national automatic curbside recycling program, state or local governments can determine what will work best for their residents: single- or dual- stream collection, and bins or carts. Rural communities can be included in the recycling initiative by utilizing the hub and spoke strategy. Most states have some sort of landfill ban, but the lack of uniformity causes great confusion among residents and haulers. Implementing uniform landfill bans across the nation for certain landfills and materials can alleviate confusion and increase the effectiveness of this recycling approach. National mandatory recycling can also be selectively applied. At least initially, mandated recycling should be imposed for large businesses and apartment facilities.

Congress should emulate Germany's successful recycling program and pass a national container deposit law. Not only would a national bottle bill increase recycling rates, it could generate revenue from unredeemed deposits. A national Pay-As-You-Throw system would increase consumer awareness of their waste consumption and move the nation toward a more sustainable economy. Each of these recycling strategies has the potential to increase the United States' unimpressive recycling rate. Combined, they will generate more profound results, and less garbage.

337. U.S. ENVTL. PROT. AGENCY, *supra* note 10; U.S. ENVTL. PROT. AGENCY, *supra* note 5.

338. McCarthy, *supra* note 16.

