Spring 2022

Policy Strategies to Solve the U.S. Recycling Crisis

Flavia M. Scotto d'Antuono
Gettysburg College

Policy Strategies to Solve the U.S. Recycling Crisis

Abstract

Following China's Operation National Sword in 2018, the politics and economics of recycling have increasingly come under scrutiny as many examine whether it remains a worthwhile endeavor. Differences across municipalities, changing prices of goods, contamination, mislabeling, and involvement by the plastics industry has further confused the issue. This paper examines to what extent a national recycling policy would be effective and what form it may take using several case studies - whether it be mandatory recycled content minimums, extended producer responsibility, or allowing the industry to phase out completely,

Keywords

Recycling, Extended producer responsibility, recycled content minimums, Federal recycling policy, public policy, Operation National Sword

Disciplines

Business | Civil Engineering | Environmental Policy | Policy Design, Analysis, and Evaluation

Comments

Written for Public Policy 401: Advanced Topics in Public Policy.

Policy Strategies

to Solve the U.S. Recycling Crisis

Flavia Scotto d'Antuono

Professor Tozzi

May 3rd, 2022

401 Public Policy Capstone

Background

The concept of recycling as it is known today did not exist until a few decades ago. Prior to the implementation of programs, many individuals sought to reduce costs by repurposing items, such as using a worn shirt as a rag (Eldred 2020). Historians like to suggest that secondhand goods and reclaimed items were commonplace for many households because individuals valued material goods differently in the past. America's involvement in World War II necessitated budgeting and resource conservation, prompting interest in certain products such as tin, rubber, steel, paper, and more (NERC 2019). By the 1960s, Americans were becoming increasingly concerned with the human impact on the environment through materials such as Rachel Carson's *Silent Spring* (Eldred 2020). This decade witnessed several cornerstone environmental laws under President Lyndon B. Johnson and President Richard Nixon (Eldred 2020). Several curbside collection systems for various materials emerged, with increased enthusiasm in the 1970s. By the end of the decade, there were said to be 220 curbside collection programs in the Pacific Northwest and New England municipalities, only 60 of which collected multiple material types (NERC 2019). By 2016, there were approximately 56,000 recycling establishments for recycling collection, processing, manufacturing, and reuse and remanufacturing (EPA).

Despite the concept of recycling being increasingly subject to criticism in recent years, recycling remains a very important waste collection process, beneficial for the community and the environment (EPA 2021). First, as a process responsible for the collection and processing of materials into marketable products again, it reduces the amount of waste sent to landfills and incinerators (EPA 2021). In turn, it reduces the need to harvest additional materials, because there is less of a demand for raw materials (North Hill Bottle Depot 2021). When this happens, it

conserves natural resources; specifically timber, water, and minerals, and does not create harmful externalities which impact water and forest systems (North Hill Bottle Depot 2021). It also conserves energy in two ways; making products from recycled materials requires less energy than making them from raw materials, and doing so reduces the energy required for virgin products in general (North Hill Bottle Depot 2021).

There are also several economic considerations for recycling. Though currently under scrutiny for economic infeasibility, the industry provides jobs to many Americans (EPA 2021). The EPA released a report in 2016 accounting for 681,000 jobs, $37.8 billion in wages, and $5.5 billion in tax revenue (EPA 2021). These numbers were calculated prior to Operation National Sword where much of Americans' trash was being exported to China. However, it still underscores the many individuals involved in collection and manufacturing as well as the potential for growth in the American market. The size of the market should prompt interest in policy strategies and solutions that take advantage of its potential.

It is worthwhile to consider why recycling has recently received much scrutiny for its shortcomings and has been reconsidered in many American municipalities. First, many Americans' recyclables are considered trash. One of the main reasons for this is due to contamination. Contaminants can be introduced into the recycling stream in various ways, such as including materials that are not accepted into their curbside recycling program (Recycling Partnership 2018). For example, if a resident places multiple water bottles in a plastic bag for collection to a facility that does not have the means to process plastic bags, the item will be considered trash and managed appropriately. This serves as an obstacle to widespread recycling programs as contamination via acceptable materials varies by locality and by recycling program.

Contaminants are also inadvertently introduced into recycling bins when there are unacceptable amounts of residue, typically from organic products, that render the entire bin trash (Recycling Partnership 2018). Therefore, nonprofits in the U.S. have identified five contaminants common to all municipalities. This includes (1) anything that can become tangled, such as clothes and cords, (2) film plastic, including plastic bags, (3) bagged items such as garbage, (4) hazardous materials such as propane tanks and needles, and finally and most importantly, (5) items that degrade, such as food, liquids, and diapers (Recycling Partnership 2018). An individual can reduce contaminants by cleaning food packaging, separating lids, and investigating the types of plastic that are appropriate to recycle (Kaufman et al 2020). However, many of these actions assume that the consumer is perfect in the sense that he or she is willing to invest the time into educating themselves on how to tailor their habits to their municipality's guidelines. This is yet another issue; as the public generally has been misled and lacks an understanding of how to recycle accordingly.

There are two main issues with contaminants. The first can be contextualized in economic viability, which is the overarching question of recycling in and of itself. When contaminants accumulate in a recycling bin, it can lower the quality of the end product as well as negatively influence the price (Kaufman et al 2020). It can also incur indirect costs when the facility must divert the refuse back to the landfill (Kaufman et al 2020). Secondly, contaminants can become entrapped in the facility's machinery and cause technical issues resulting in malfunction, generally increasing the cost of recyclables (Kaufman et al 2020).

High levels of contamination in recycling bins would have served as a major obstacle to Materials Recovery Facilities, otherwise known as MRFs, in the U.S. However, for many decades, many countries in the Global North were exporting trash and recyclables to China for

disposal (Jain 2020). China was the primary buyer for several reasons. First, countries could export their undesirables to China for minimal shipping costs, the contamination standard was comparatively low, and the country's rapid growth justified the use of waste-to-energy incinerators (Katz 2019). Many municipalities were able to subsidize their recycling program by taking advantage of the market in China, which went unnoticed by many Americans until the dissolution of this process.

China abruptly enacted Operation National Sword in early 2018, effectively banning the import of materials destined for processing within the country (Katz 2019). Because China was importing waste in large containers, many consumers were instructed to participate in "single-stream" recycling programs, where paper, plastics, cans, and bottles could congregate in standard blue bins, increasing the contamination rate (Katz 2019). Additionally, it solidified the idea in many consumers' minds that more items were recyclable than was actually true. China, which had by then established itself as a competitive economy on the world stage, realized that in importing the world's discards, it was also importing a pollution issue (Jain 2020). Further, recycling plastic through incineration poses numerous health threats as it contains hazardous materials such as heavy metals and brominated flame-retardants (Filho et al 2019). China's plastic imports were reduced by 99% percent within a single year and the country's imports of mixed paper have been reduced by a third (Katz 2019). Meanwhile, the U.S. was confronted with the shortcomings of its own recycling infrastructure, having previously exported 70% percent of its plastic collection and significant amounts of other products (Jain 2020).

The plastic industry in the U.S. capitalizes upon mislabeling, undermining the legitimacy of recycling practices while simultaneously contributing to a false narrative in which consumers believe themselves to be doing the correct behavior. This is an important consideration when

analyzing the recycling industry. There are seven plastic resin identification codes; with first one being the most familiar, as it concerns plastic bottles of Polyethylene Terephthalate, otherwise known as PET #1 (Hocevar 2020). The second code refers to High-Density Polyethylene and includes items such as milk jugs, shampoo bottles, and detergent containers (Hocevar 2020). For other codes, many would be shocked to discover that many items traditionally thought of as recyclable, such as yogurt containers, straws, egg cartons, and more, are not designed for much of the country's domestic plastics recycling capacity (Hocevar 2020). Prior to China's ban, the U.S. could accept payment for shipping these materials to China, though much of this was considered refuse and was burned for fuel (Cho 2020). Nonprofits and environmentalists have recently demanded that companies such as Nestlé, Walmart, Procter & Gamble, and Unilever adjust their labels as many of their products are mistakenly believed to be recyclable when coded with the numbers three through seven (Cho 2020).

Producers rely on consumers conflating resin codes with recycling codes in an effort to appear more environmentally-friendly. There is arguably a certain psychology to placing recyclables in a blue bin; it justifies the consumption of plastic, serves as a "feel-good" act, and alleviates the burden of the company from seeing it through its end of life stages. The organization that administers the codes, ASTM International, has defended the system, stating that it was never meant to determine recyclability (Petsko 2020). However, industry documents reveal that lobbyists were requesting the recycling symbol to appear on all plastics as early as 1989 (Romer 2021). As the world seeks alternatives to oil and gas, it is likely that the industry will have to pivot towards plastic production. In fact, there has already been a massive investment of plastic production in the United States due to the funneling of $200 billion dollars into over 340 petrochemical projects (Hocevar 2020). This has enabled the virgin plastics market

to witness historic lows that are oftentimes now cheaper than the processing cost of recovered plastics, further complicating the issue of recycling (Hocevar 2020).

The loss of a market has prompted many questions about the economics of U.S. recycling programs. New York City represents one of many cities across the U.S. that has wrestled with the idea. Talks of suspending the city's recycling collection program began in 2020 with Mayor Bill de Blasio, just two years after China's implementation of Operation National Sword. Like all major cities, NYC was seeking to reduce the annual budget for its many operations as the pandemic warranted emergency spending. Sanitation was also at the forefront of many residents' minds, with the garbage industry already witnessing staffing shortages and complexities with COVID-19 rules. Simplifying the collections process could reinvigorate an industry, not to mention ease the financial troubles in the largest U.S. city (Husock 2020).

One study estimated that eliminating recycling would restore approximately $340 million annually in taxpayers' money (Husock 2020). Many proponents argue that this money can be better invested elsewhere, such as providing other environmental benefits (Husock 2020). New Yorkers generally spend a little over $200 million dollars annually to collect close to 300,000 tons of paper, only to generate $3.6 million dollars back in revenue to culminate in a net loss (Husock 2020). The rate for which paper can be purchased is also declining as well; in 2017, one ton of paper sold for $14 dollars, netting two dollars less per ton just two years later (Husock 2020).

Aside from economics, there are also place-specific and cultural factors that must be considered, especially given that recycling varies by municipality and requires an individual's behavior. Specific to NYC, a 2015 study found that only 15% percent of the Housing Authority's designated places were fitted with recycling bins (Goldenberg and Dunn 2020). The NYCHA

responded by promising to provide all public complexes with bins, though many are a far walk from residents (Husock 2020). It is also reasonable to assume that many residents are simply unwilling to perform the walk to properly dispose of their refuse. Skeptics also refer to the unwillingness of local politicians to charge for garbage collection per bag, as is commonplace in many European cities, citing NYC's impermeable rental culture where many fines would be absorbed by landlords (Husock 2020). Others have suggested that given pressure to complete tasks, especially in such a large city, sanitation workers are pressured to mix refuse rather than take their time with it (Husock 2020). Finally, naming an "Amazon effect," New Yorkers are known for their proclivity toward convenience, which often manifests as takeout containers, cardboard boxes, and similar pulp and paper products (Husock 2020).

Despite the challenges of recycling, it remains a worthwhile concept. The sector is substantial, especially when considering the number of individuals who are employed by recycling centers and other facilities. Many Americans habitually recycle, instilling a domestic environmental ethic that is becoming increasingly prominent in the face of climate change. However, with a lack of a market and adequate infrastructure, coupled with the widespread and variable issue of contaminants and the power of the plastics industry, there are severe problems that will render recycling futile if left unaddressed. The following policy strategies are informed by the successful and multifaceted models undergoing innovation in different municipalities across the country and the globe. While each strategy has its advantages and disadvantages, they seek to subdue or eliminate the aforementioned problems to promote a viable and promising industry in desperate need of reform.

Solution #1 - Do Nothing

There are several policy solutions to address the recycling crisis in the U.S. The first option to consider is a do-nothing policy. Given current trends, there is evidence to suggest that recycling rates in the U.S. could subside in the coming years. It is reasonable to presume that the factors which render the current process a failed system will contribute to its eventual demise, representing the same outcome that would occur if all municipalities in the U.S. chose to terminate their programs.

This policy strategy provides a few different opportunities. First, municipalities can choose a local solution that best suits their needs. This could mean closing altogether, as a California plastic recycling facility did with all of its 284 sites in 2019, or opting for more creative or market-based solutions (Husock 2020). Curbside recycling pick-up programs could be temporarily terminated until market conditions become more favorable (Husock 2020). However, this ignores the many employees who require consistent work conditions and the fact that market conditions may not exhibit any particular pattern, putting the physical infrastructure in place at risk.

Another suggestion is to confine recycling to valuable materials that warrant high prices (Husock 2020). While this does have potential, one member who works in waste management spoke to its challenges. For a curbside recycling program, this would mean that residents would need to be made constantly aware of what commodities are currently being accepted for recycling by their curbside pick-up program (Neiderer 2022). While possible, it can become discouraging to a consumer who is consistently receiving changing information. Market conditions can change by the day, rendering it physically and economically impossible to inform

residents of these changes through physical notices, such as infographics (Neiderer 2022). Given the extensive use of the internet, it is likely more practical to post to a website. The representative of the industry spoke to its utility, with the caveat that in their rural area, it is common for municipalities to have part-time secretaries who are already burdened with several responsibilities. It would require more government funding or grant money to ensure tasks are being fulfilled (Neiderer 2022).

More creative solutions would require the use of several different ideas tailored to the local level. San Francisco is one example, having rightfully earned a reputation as a leader of recycling in America, diverting approximately 80% percent of its waste from landfills as of 2018 (Brigham 2018). The city's Mandatory Recycling and Composting Ordinance of 2009 requires that residents separate recyclables, compostables, and trash from each other, or face fines and penalties (EPA). Trash collection rates are much higher than those for recycling or composting to further incentive residents to minimize waste, another innovative solution that has proved to be an effective market incentive (Brigham 2018). In 2019, the city charged $6.97 dollars for each trash bin (Goldenberg and Dunn 2020). Composting, while not a mainstream system, complements recycling initiatives set forth by San Francisco.

Officials also cited the bin sizes of the receptacles provided to each household as being pertinent to the city's objectives; with a 64-gallon blue recycling bin, a 32-gallon green composting bin, and finally, a small, 16-gallon black trash bin (Brigham 2018). Additionally, customers that were found to have improperly separated trash or left too many contaminants in the recycling to render it useless, received double charges (Goldenberg and Dunn 2020).

The city has also spent a lot of time, money, energy, and resources on educating the public to properly do as is required through the use of promotional images (EPA). Images may

be accompanied by several different languages, namely Chinese and Spanish, of which the customer service operators are proficient in so as to accurately respond to questions (EPA). Also integral is the prohibition of single-use plastic bags, single-use utensils, and other items that come in materials that are difficult to recycle (Goldenberg and Dunn 2020). The city does have a unique circumstance in that San Francisco officials set rates for refuse collection and a company called Recology has absorbed every city permit (EPA). Such a partnership reduces administrative tasks and costs, while enabling collaboration between city officials and management at Recology (Brigham 2018).

Instead of choosing to eliminate the recycling program, the city was able to integrate a few very creative solutions into existing infrastructure, all of which have largely been welcomed by the community. It is empowering to a community to have localized and effective solutions, something that is lacking in the other policy strategies to be proposed. Doing nothing means that cities can adjust, like San Francisco, or alternatively, close their programs and use their funds to invest in other programs. Doing so could potentially save money for a municipality that chooses to divert funds to a more pressing issue, such as their public school or another public good.

The disadvantage to this is that many Americans like recycling and actively participate. Ending a long-standing program makes it more difficult for the many do-gooders who make recycling a part of their everyday routine and contributes to the erosion of an already contentious environmental ethic by the American public (Neiderer 2022). Programs cannot attain recycling goals without proper support though, which is where the next two policy strategies prove to be worthwhile of consideration.

Solution #2 - Extended Producer Responsibility

One solution to mitigating the recycling crisis in the U.S. is through extended producer responsibility programs. Extended producer responsibility (EPR) is a policy approach in which producers are responsible for the treatment or disposal of their products following use by a consumer. A company would do this by paying for a facility to process the post-consumer products or by physically overseeing its end-of-life process (OECD). The easiest way to do this is to charge producers a fee based on certain criteria, such as the number of tons of packaging utilized, which is then collected and audited by a third-party entity that will reimburse municipal programs for their operations (Choi-Shagrin 2021). The rationale for EPR programs is that instead of taxpayers subsidizing ineffective recycling programs, the trouble is instead placed upon the producer of the good. Ideally, producers would respond by promoting product design that is mindful of the environment by reducing waste (OECD). Such a law also incentivizes manufacturers and distributors to educate consumers, engage in public-private partnerships, and become active participants in policies aimed at further creating a circular and closed-loop economy (Martins 2021). Further effective collaboration could come from integrated relationships amongst several key stakeholders; such as manufacturers, brand owners, producers, regulators, distributors, retailers, consumers, residents, taxpayers, municipalities, educators, generators, stewardship agencies, collectors/haulers, receiving sites, processors and recyclers (Diggle and Walker 2020).

EPR programs are not a novel idea; in fact, several states have EPR legislation targeting materials such as paint, batteries, carpet, mattresses, and electronics (Martins 2021). It is estimated that Connecticut, which has EPR programs for mattresses, paints, electronics, and thermostats, has saved 26 million pounds of waste since 2008 (Choi-Shagrin 2021). Bottle

deposit programs, in which consumers can return bottles to facilities in exchange for a small profit, are another example and have proven quite popular and effective. For example, when New York's state legislature sought to propose legislation directed towards EPR for packaging, over 160 organizations responded via written comments urging lawmakers to reject the proposal, yet expand the bottle deposit program given its success (Heffernan and Paben 2022). A representative of the recycling industry reaffirmed the success of these programs, citing its exploration in Pennsylvania following local demand (Neiderer 2022).

New York is one of many states that has recently proposed EPR legislation for packaging materials, alongside California, Maryland, Vermont, Connecticut, Illinois, Washington, and New Jersey (Heffernan and Paben 2022). The state legislatures of Rhode Island, Hawaii, Colorado, Massachusetts, New Hampshire, and Virginia have all witnessed failed efforts at various attempts to move towards implementing EPR programs for packaging (Heffernan and Paben 2022). As of 2021, only Maine and Oregon have been able to pass EPR bills (Heffernan and Paben 2022). There is much momentum in this area for the U.S. given how instrumental and effective EPR legislation has proven to be in other countries, in part or in full, such as Japan, South Korea, and Canada (Choi-Shagrin 2021).

EPR was first implemented in Europe in the early 1990s for beverage packaging (Filho et al 2019). Nearly all of the countries in the European Union now have EPR laws and have observed their recycling rates improve dramatically. One example is Ireland; in 2000, the country's recycling rate was 19% percent, rising to 65% percent just seventeen years later (Choi-Shagrin 2021). Despite these accomplishments, many have suggested that the EPR scheme in the EU lacks harmonization and transparency for differences in goals and scope (Filho et al 2019). This is in part due to the fact that EPR can be implemented with full or partial financial or

operational responsibility, creating unfair competition and an imbalance at the national level and when considering the entire European Union (Filho et al 2019).

Given that EPR programs are at the interface of the public and private sectors, there are several different opportunities, outcomes, and impacts for various stakeholders that must be evaluated to consider the overall effectiveness of such a measure. One key group is the consumers of these products. Historically, recycling has been each individual's responsibility (Valderrama 2021). This has proven detrimental to the recycling industry because for many consumers, the decision to recycle relies on its convenience (Valderrama 2021). As previously suggested, consumers are frustrated because they do not necessarily know how to recycle (Choi-Shagrin 2021). What is recyclable varies based on municipality, there is a lack of education on contaminants, and consumers have been misled to believe their consumption is justifiable so long as they are seemingly doing the right thing. Frustration also comes from the fact that there are fines for using the wrong bin, fees for not using reusable bags, and forfeited deposits for unreturned bottles (Choi-Shagrin 2021). EPR eliminates much of these qualms because it emphasizes the importance of producer responsibilities and roles, rather than the individual's behavior (O'Brien 2021). EPR benefits consumers because it alleviates punishment for errors or negligence in a confusing and cumbersome system (Choi-Shagrin 2021). Additionally, since producers will now finance much of the recycling industry, taxpayers' money can be redirected toward other problem areas.

This was met with much opposition from manufacturers, packaging-industry groups, and retailers. Producers will now be required to support recycling in their local communities, invest in environmentally-friendly package designs, and create resources to educate their consumers, all of which come at additional cost to them. Critics have expressed concern that this will prompt

brands to utilize heavier-weight materials in an effort to consume less plastic, which will create a different problem; increased emissions during transportation (Shelton 2021). Industry representatives have rejected the idea of EPR, citing the excessive government authority and lack of input from the producers (Choi-Shagrin 2021). In a letter to Connecticut lawmakers regarding their consideration of an EPR law, the Institute of Scrap Recycling Industries, Inc. denies EPR programs as none were created in consultation with industry leaders as well (ISRI). Given that there was an emerging theme of frustration of these stakeholders, state lawmakers should ask for representative input so as to mitigate animosity over proposed EPR policies. Those at ISRI also maintain that EPR policies limit competitive markets that ensure low prices for recycled materials, ignore the strengths of the existing recycling industry, and are unconstitutional because it impedes on property rights (ISRI).

The latter argument would likely be commonplace to many states that are not currently considering EPR policies yet would be obligated to under a federal mandate. As of 2021, over 60% percent of EPR bills were created by Democrat representatives, with approximately 30% percent of EPR bills being written by Republicans (Valderrama 2021). Despite there being both interest and practicality in a federally-mandated EPR law as recycling is a bipartisan issue, it is best to provide incentives for states to create their own EPR policies until there is more momentum across the nation. The recycling industry has largely warned against a federal EPR program given current conditions, underscoring the differing infrastructure between rural and urban areas (Neiderer 2022). A federal EPR policy would likely prove costly and would entail sister policies or significant investment to create a common standard in every single locale.

There are also concerns over how this would impact prices. Critics insinuate that consumers will pay for this policy through price increases. However, a study in Oregon found

that on average, consumer prices increased by less than a full cent, at $0.0056 per item (Choi-Shagrin 2021). Additionally, many politicians in favor of EPR legislation have hinted that the laws can be written to prevent price gouging (Choi-Shagrin 2021). To address the concerns of companies, there would need to be regulations to ensure that every brand bears the same cost (Shelton 2021).

Furthermore, despite complaints by industry leaders, dozens of companies, including L'Oreal, Mars Inc, Nestlé, PepsiCo, Coca-Cola, Mondi, and more have endorsed statements by nonprofits calling for the implementation of EPR schemes (Ellen MacArthur Foundation). Companies are becoming increasingly aware of the reputational risk founded in a disregard for the environment in an increasingly climate-concerned and conscientious world. There is a likely possibility that in the future, companies that refuse to comply with state-mandated EPR schemes will anger and distance consumers, forcing them to rethink their strategies and priorities.

While many companies have pledged their support, others have been quietly lobbying against the passage of EPR laws; or have been doing both, likely to appeal to the growing consumer concern for the environment while working to ensure their own priorities are realized. In 2016, Greenpeace revealed documents verifying that Coca-Cola had been advocating against packaging schemes in Europe for two years (McClenaghan 2017). It gives pause to the sincerity of Coca-Cola and other companies' support and willingness to comply in a transparent manner. Members of the recycling industry do feel that it is important for investors to pressure companies and make them aware of their demands, as the most effective recycling solution will come from the private industry. Several studies have reached a similar conclusion, stating that producers are the best-positioned actors to facilitate changes to minimize the negative externalities of the products which they release onto the market (Filho et al 2019).

Solution #3 - Recycled Content Minimums

The next solution is the idea of recycled content minimums, otherwise known as mandatory recycled content laws. Mandatory recycled content legislation is a demand-side policy, meaning it creates demand for materials by requiring producers to include a certain amount of post-consumer recycled content in the packaging of products they offer (Oceana 2022). This has previously existed in the form of a commitment by a company, of which many consumers may be familiar. For example, the Naked Juice Company has made bottles of 100% post-consumer content for all of its juices and smoothies since 2010 (McNees 2022). Beverage companies such as Evian, Nestlé, and Coca-Cola have similar commitments, although with commitments for upcoming years, such as the latter's pledge of using 50% recycled content in all packaging by 2030 (McNees 2022).

States are becoming progressively more willing to pursue this endeavor as well. New Jersey, Washington, and California are examples of states that have approved legislation to require certain plastic products to contain a certain amount of recycled content, though the idea can extend to any material (Quinn 2022). To illustrate an example, California's law, AB478 requires that thermoform plastic containers to contain at least 30% post-consumer recycled plastic by 2030 (LaMotte et al 2022). California's law differs from Washington state's, which has proven more comprehensive and stringent, simultaneously exemplifying how different recycled content minimum laws can take force. SB5022 creates recycled content minimums for several plastic products while also banning other types of plastic, such as polystyrene, or more familiarly, packaging peanuts, used as cushioning material for the shipment of fragile objects (LaMotte et al 2022). Within this law, there is also a ban on single-use plastic products such as

straws and utensils, for takeaway meals at restaurants; this has been implemented as a stand alone bill in some states (LaMotte et al 2022).

New Jersey's legislation requires different percentages of post-consumer recycled content in plastic containers, glass containers, paper and plastic carryout bags, and plastic trash bags (ISRI). As of 2020, there were 17 different bills related to recycling content in packaging across seven states (Felton 2022). Interestingly enough, the Institute of Scrap Recycling Industries (ISRI), despite dismissing EPR programs, published a press release in which it commends New Jersey for its recently passed recycled content law (ISRI). The ISRI applauded the bill for its intent to increase demand for recycled plastics and potential to model legislation for other states seeking similar initiatives (ISRI).

Besides identifying and promoting an old yet undeveloped industry, recycled content minimums underscore the very premise of recycling in the first place; it reduces demand for virgin materials in new products (Oceana 2022). Subsequently, it reduces the emissions associated with material production, resource extraction, and energy consumption (Oceana 2022). It also minimizes the amount of water vital to produce packaging items (Oceana 2022). Oil extraction, a necessary step in the process towards plastic production, is highly polluting, exposing employees to toxic chemicals and a myriad of prospective health issues (Oceana 2022). Reducing its frequency to any degree is a major breakthrough, although, given the proclivity of the plastics industry, executives will make moves to protect the longevity and scope of the industry to the extent possible.

Requiring and enforcing recycled content minimums levels would also prove beneficial because it could level the playing field across all companies when it comes to packaging (Oceana 2022). Companies that operate in several states yet must abide by special circumstances in New

Jersey, Washington, and California are presumably afflicted with unique administrative and financial discrepancies as a result of variable laws. However, there is limited research into how businesses deal with recycled content minimums and the policy in general, emphasizing the need for additional investigation. It is hopeful that in the coming years, stakeholders will be able to speak upon the effects of such laws in the aforementioned three states, which will serve as critical information towards a federal mandate or more comprehensive state guidelines.

Many stakeholders have already presented several of their concerns with such mandates. Much of this has to do with technology. To ensure this policy strategy would be effective, there needs to be an optimized system for collection, sorting, and processing (Oceana 2022). Additionally, the commodity must be present in sufficient quantities to undergo these processes as well and be shipped to its intended destination (Oceana 2022) Recycling industry representatives refer to the need for significant investment in order to do this, citing that China's abrupt absence has revealed the shortcomings of many local programs and facilities (Neiderer 2022). There are also problems that would disrupt the flow of materials and would justify a continuous investment into the plastics introduction and its production, as plastic can only be recycled between two to three times before the polymers break down to the point where it can no longer be utilized (Sedaghat 2018). The life cycle of paper is longer, as the EPA has stated that several paper types can survive between five to seven times in the recycling process (Choi-Shagrin 2021).

Contaminants will remain an issue for recycled content mandates without sister policies, grant money, or aggressive education initiatives (Neiderer 2022). Because recycled content minimum laws simply create a demand for recycled commodities and do not refer to the facility's capabilities themselves, the problem of contaminants remains unchanged yet in need of

being addressed. Quality specifications also vary depending on end use and regulatory requirements, further adding to the complexity of the issue (Felton 2022). It is therefore fair to maintain that recycled content minimums do not alleviate the consumer of the burden of cleaning and caring for their recyclables.

There is also concern over how recycled content minimums would be enforced. There is not yet substantial information to correctly account for patterns or best practices. Nonprofits have advocated for annual reporting based on weights, percentages, formats, and flows (Oceana 2022). It is normal to raise concerns with a business doing an internal review and reporting process, as numbers and data can be manipulated or misrepresented so as to achieve a certain understanding with a government agency. This would call for the use of third-party audits to ensure transparency and accountability as well. Additionally, as with many policies, there should be fees for non-compliance and the prohibition of the sale of products that refuse to comply with set standards (Oceana 2022). In sum, the bill would require manufacturers, distributors, and retailers to revise their supply chains (LaMotte 2021). This can be a costly and time-intensive process, especially for companies that have not mapped their supply chain to date.

The plastics industry has sustained their opinion against recycled content minimums. One industry representative stated that the U.S. would need to build at least 145 mechanical recycling plants to meet 2025 targets, let alone 2030 targets (Petsko 2020). This requires a baseline of 45% compounded annual growth rate (Petsko 2020). Again, this suggests that recycled content minimums cannot be pursued unless coupled with sister policies to target devastating shortcomings.

Many nonprofits recommend that recycled content minimums are not mandated at the federal level. Applying one state's content levels to other areas of the country that lack the

proper infrastructure and interest will be impotent, as there will be an insufficient supply of recyclable material to meet the policy requirement (Oceana 2022). Additionally, it may prove costly to states who will have to buy excess recyclable material from states with more robust programs, many of which could be located far away. This acknowledgment calls for a number of compliance options. For example, there can be an average standard across manufacturers or the ability to compensate for a lack of a target level in a few products by ensuring a higher level in other products where it is more feasible (Hogg 2022). It is also for this reason that recycled content minimums are best executed when paired with "sister policies" (O'Brien 2021). One sister policy is EPR, considered a driver of plastics sustainability because it can help fund local recycling systems and improve collections (Quinn 2022).

Still, other nonprofits and organizations advocate against further exploration of this policy. One report suggests that any benefits that would arise would be from shifts in location rather than creating a demand, recommending instead to consider a tradable credits approach (WWF). For the time being, it is best to permit states to establish their own laws to advance recycling, and the case is no different with recycled content minimums. It is also important for states to create modest targets to ensure feasibility and to allow for the industry to properly adjust and for growth of supply (Oceana 2022). These targets can then be increased incrementally over time. Until there has been sweeping momentum domestically or proven and effective programs to be copied from other countries or regions, it is more economically sensible to simply explore the idea. However, many stakeholders are in agreement that a policy should not be one in which companies can "opt-in." Given that virgin materials are cheaper than recycled materials, it disincentivizes companies from participating and the subsequent look or weight of the packaging to the consumer may change their purchasing habits (Oceana 2022).

Conclusion

Recycling is a broken system in the U.S. The abrupt termination of China's willingness to import a majority of our waste has exposed current recycling infrastructure as insufficient to handle America's recyclables domestically. Additionally, recycling is an incredibly complex issue given differences in processes between municipalities, rapidly changing market values for each commodity, the widespread issue of contamination, overreliance and confusion regarding plastics and single-use items, and a lack of education for consumers. In spite of the many problems, recycling remains integral to the American environmental ethic and can provide many benefits when conserving resources, providing individuals with jobs, and contributing to taxes.

The U.S. is not ready for a federal recycling mandate yet. Differences across municipalities and the varying degrees to which areas may recycle or have the adequate infrastructure would severely inhibit the growth of the industry and would require significant investment by the federal government. Conversely, if left to each individual municipality, governing officials may justify the economic infeasibility of recycling in its current state to close programs. This would have far-reaching and devastating consequences for those who are employed in the industry, as well as the many people who enjoy recycling.

The EPR program has promise. While the U.S. is not ready for a federal mandate regarding EPR given the dismal infrastructure, EPR can support investment into local municipalities and encourage the recycling market. EPR has proven effective in many other countries, which can serve as potential models for state and federal levels of government. As concerns for climate risk grow, consumers are becoming increasingly concerned with sustainability and would welcome this opportunity.

Recycled content minimums are another viable option, however, there is limited research in this area or models to study. A good idea in theory as a demand-side policy, its shortcomings render the idea very unstable, given that it may not provide a steady supply of recyclable material. Recyclable materials do break down regardless, and consumers would still be responsible to properly and adamantly care for their products. Mandates for recycled content minimums should ensure flexibility in how producers can reach certain benchmarks and states should steadily increase their minimum numbers rather than seek unattainable goals.

Works Cited

Brigham, Katie. "How San Francisco Sends Less Trash to the Landfill than Any Other Major U.S. City." *CNBC*, CNBC, 14 July 2018, https://www.cnbc.com/2018/07/13/how-san-francisco-became-a-global-leader-in-waste-management.html.

Cho, Renee. "Recycling in the U.S. Is Broken. How Do We Fix It?" *State of the Planet*, 8 Dec. 2020, https://news.climate.columbia.edu/2020/03/13/fix-recycling-america/.

Choi-schagrin, Winston. "Maine Will Make Companies Pay for Recycling. Here's How It Works." *The New York Times*, The New York Times, 21 July 2021, https://www.nytimes.com/2021/07/21/climate/maine-recycling-law-EPR.html.

Diggle, Avalon and Walker, Tony. "Implementation of Harmonized EPR Strategies to Incentivize Recovery of Single-Use Plastic Packaging Waste in Canada." *Science Direct*, 1 June 2020. https://doi.org/10.1016/j.wasman.2020.05.013.

Eldred, Sheila Mulrooney. "When Did Americans Start Recycling?" *History.com*, A&E Television Networks, 14 Apr. 2020, https://www.history.com/news/recycling-history-america.

"Extended Producer Responsibility." *OECD*, https://www.oecd.org/env/tools-evaluation/extendedproducerresponsibility.htm.

Felton, Dan. "Recycled Content Mandates: Pros and Cons." *Packaging World*, 13 Oct. 2020, https://www.packworld.com/issues/sustainability/article/21197144/recycled-content-mandates-pros-and-cons.

Goldenberg, Sally, and Danielle Dunn. "Wasted Potential: Recycling Progress in Public Housing Eludes City Officials." *POLITICO*, https://www.politico.com/states/new-york/albany/story/2020/01/07/wasted-potential-recycling-progress-in-public-housing-eludes-city-officials-1246328.

Heffernan, Marissa, and Jared Paben. "Why EPR for Packaging Failed in Washington State - Resource Recycling." *Resource Recycling News*, Resource Recycling, 30 Mar. 2022, https://resource-recycling.com/recycling/2022/03/29/why-epr-for-packaging-failed-in-washington-state/.

Hogg, D. et al. "Demand Recycled: Policy Options for Increasing the Demand for Post-Consumer Recycled Materials," Eunomia and World Wildlife Fund, 2018, https://www.wwf.org.uk/sites/default/files/2018-11/Policy%20Options%20for%20PCR_Final%20Version_Clean.pdf

Husock, Howard. "The Smart Way for Post-Coronavirus Pandemic NYC to Save Money: Stop Recycling." *New York Post*, New York Post, 29 May 2020, https://nypost.com/2020/05/16/the-smart-way-for-post-pandemic-nyc-to-save-money-stop-recycling/.

Husock, Howard. "The Declining Case for Municipal Recycling." *Manhattan Institute*, June 23, 2020.

"ISRI Commends New Recycled Content Law in New Jersey." *ISRI*, https://www.isri.org/news-publications/news-details/2022/01/20/isri-commends-new-recycled-content-law-in-new-jersey.

Jein, Aarushi. "Trash Trade Wars: Southeast Asia's Problem with the World's Waste." *Council on Foreign Relations*, Council on Foreign Relations, 8 May 2020, https://www.cfr.org/in-brief/trash-trade-wars-southeast-asias-problem-worlds-waste.

Katz, Cheryl, et al. "Piling up: How China's Ban on Importing Waste Has Stalled Global Recycling." *Yale E360*, 7 Mar. 2019, https://e360.yale.edu/features/piling-up-how-chinas-ban-on-importing-waste-has-stalled-global-recycling.

LaMotte, K. Russell, et al. "Washington State Plastics Bill Imposes Minimum Content Requirements on Many Household and Food Service Products Nicole J. Waxman." *Beveridge & Diamond PC*, 27 Apr. 2021, https://www.bdlaw.com/nicole-j-waxman/publications/washington-state-plastics-bill-imposes-minimum-content-requirements-on-many-household-and-food-service-products/.

LaMotte. "States and Federal Government Continue to Advance Plastics Recycling and Minimum Recycled Content Mandates." *The National Law Review*, 2022, https://www.natlawreview.com/article/states-and-federal-government-continue-to-advance-plastics-recycling-and-minimum.

Martins. "Extended Producer Responsibility Bills Gain Momentum." *Retail Industry Leaders Association*, 2021, https://www.rila.org/blog/2021/04/extended-producer-responsibility-bills.

McClenaghan, Maeve. "Coca Cola and the 'Fight Back' against Plans to Tackle Plastic Waste." *Unearthed*, 14 Sept. 2017, https://unearthed.greenpeace.org/2017/01/25/investigation-coca-cola-fight-back-plans-tackle-plastic-waste/.

McNees, Marissa. "Experts Discuss Pros and Cons of Recycled-Content Mandates." *Recycling Today*, Recycling Today, 11 Jan. 2022, https://www.recyclingtoday.com/article/experts-weigh-in-on-recycled-content-mandates-at-nerc-newmoa-webinar/.

N.A. "A Brief History of Recycling." *Northeast Recycling Council*, https://nerc.org/news-and-updates/blog/nerc-blog/2019/11/19/a-brief-history-of-recycling

N.A. "Results of Recycling Economic Information Study for Recycling Market Development." *EPA*, Environmental Protection Agency, https://archive.epa.gov/wastes/conserve/tools/rmd/web/html/result.html.

Neiderer, Laura. Personal Interview, Conducted by Flavia Scotto. 27 April 2022.

O'Brien, Daniel. "Rethinking Reduce, Reuse, and Recycle: Policies and Programs to Address Waste." *EESI*, 20 Apr. 2021, https://www.eesi.org/briefings/view/042021waste.

Petsko, Emily. "Recycling Myth of the Month: Those Numbered Symbols on Single-Use Plastics Do Not Mean 'You Can Recycle Me'." *Oceana*, 11 Mar. 2020, https://oceana.org/blog/recycling-myth-month-those-numbered-symbols-single-use-plastics-do-not-mean-you-can-recycle-me/.

Quinn, Megan. "Lack of Recycled Resin Could Challenge Company Sustainability Goals." *Supply Chain Dive*, 23 Mar. 2022, https://www.supplychaindive.com/news/2022-plastics-recycling-policy-brand-content-2025/620873/.

"Recommendations for Recycled Content," Oceana, 2022, https://oceanconservancy.org/wp-content/uploads/2022/02/RRS_OceanConReport_Feb2022_Final.pdf

"Recycling Basics." *EPA*, Environmental Protection Agency, https://www.epa.gov/recycle/recycling-basics.

Romer, Jennie. "The History of Plastic Resin Identification Codes in Recycling." *Greenbiz*, https://www.greenbiz.com/article/history-plastic-resin-identification-codes-recycling.

Sedaghat, Lilly. "7 Things You Didn't Know about Plastic (and Recycling)." *National Geographic Society Newsroom*, 13 Apr. 2018, https://blog.nationalgeographic.org/2018/04/04/7-things-you-didnt-know-about-plastic-and-recycling/

Shelton, Suzanne. "The Upsides and Downsides of Maine's New EPR Law." *Greenbiz*, 13 Aug. 2021, https://www.greenbiz.com/article/upsides-and-downsides-maines-new-epr-law.

"US Recyclers Begin Road to Recovery after China Bans Recyclables." *The Recycling Partnership*, 18 Oct. 2018, https://recyclingpartnership.org/us-recyclers-begin-road-to-recovery-after-china-bans-recyclables/.

"Why Is Recycling Important: 10 Benefits of Recycling." *North Hill Bottle Depot*, 22 July 2021, https://northhillbottledepot.ca/why-is-recycling-important-10-benefits-of-recycling/.

Reducing Contamination of Household Recycling, Monash University, Kaufman, S, et al, 2020 Greenpeace, Circular Claims Fall Flat, Hocevar et al 2020 https://www.sciencedirect.com/science/article/pii/S0959652618339799

Valderrama, Gabriella. "Pioneering EPR Policies in the United States," University of Michigan, April 2021, https://closupstage.fordschool.umich.edu/sites/closup/files/2021-06/closup-swp-72-Valderrama-Pioneering-EPR-Policies-in-the-United-States.pdf.