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The State of Recycling National Survey

U.S. PIRG Education Fund

ENVIRONMENT AMERICA RESEARCH & POLICY CENTER

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November 14th, 2019

U.S. PIRG
Education Fund

Acknowledgements

The authors bear responsibility for any factual errors. The recommendations are those of U.S. PIRG Education Fund. The views expressed in this report are those of the authors and do not necessarily reflect the views of our funders.

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Introduction

You toss your plastic water bottle in a recycling bin after coming home from a trip to the beach, hoping the plastic from that bottle will be in next year's plastic bottle, right? It most likely will not. Currently, plastic can only be re-manufactured a limited number of times, at best into a lower quality product because it degrades each time it is recycled.[1] The value of recycled plastic may be low enough that your bottle is instead burned in an incinerator or dumped into a landfill. A few years ago, that plastic might have been sold to China or another foreign nation. However, over the last few years, countries across the Pacific are putting restrictions on importing U.S. waste. Without these export markets, the U.S. recycling industry is in serious trouble, as exemplified by your plastic bottle's likely journey to a landfill or incinerator. Of course, using a reusable water bottle would have avoided this issue, and for that reason, reduction and reuse strategies are preferable to recycling, even when recycling works.

The State of Recycling—A National Survey

Across the United States, our recycling system is faltering. Local governments from Jackson, Mississippi to Sierra Vista, Arizona are ending their curbside recycling programs. Many other municipalities have reduced the list of materials they will accept.[2] [3] Even when recycling does end up in a blue bin, it may be immediately landfilled or burned -- until earlier this year roughly half of Philadelphia's collected recycling was being sent to incinerators.[4] These are not isolated incidents but are increasingly our new normal. What went wrong? Why are we moving backwards on recycling, an important tool for fighting environmental pollution and climate change? And why is plastic to blame?

The collapse of international recycling markets

For decades, one of the United States' largest exports to East Asia by weight was waste.[5] Rapid economic growth, high demand for materials, and cheap labor made it economical for these Asian countries to sort through U.S. recyclables that were often commingled with low-value or unrecyclable materials.[6] And from the U.S. perspective, exporting waste was easier than handling it domestically, so the U.S. sent its waste overseas in massive amounts and counted it as recycled.[7] This arrangement was far from perfect, however. Once these countries had sorted out the valuable materials from the U.S.' recyclables, they would throw out or incinerate the rest—practices detrimental to both public health and the environment.[8][9]

Starting in early 2018, East Asian governments began banning, limiting, or more heavily regulating U.S. recyclable exports.[10] The era of globalized waste trade came to a sudden end and the U.S. was left to deal with its flawed recycling system.

Ongoing structural issues

While many commentators have blamed East Asian import restrictions for our current struggles, the U.S. is at fault for becoming dependent on exporting its recyclables. The United States failed to curb the rise of plastic, failed to build domestic demand for recycled material, and failed to ensure that product designers considered the end life of their products.

Recycled materials lack markets

Recycling depends on the idea that the cost of collecting and sorting certain materials is rational because somebody will want to buy them to make something else. In reality, many plastics have no such market. Without domestic manufacturers creating more goods made from recycled material, we cannot fuel a functional recycling system. If we want to improve our recycling system, we need to use better materials and create a market that is fueled and funded in part by the manufacturers themselves.

Producers aren't held responsible

Currently, most product designers are under no obligation to consider how their products will be disposed of at the end of their useful life. This leads to the creation of unrecyclable products. For example, some flexible drink packaging combines plastic and metal and the two materials are too difficult to separate to be recycled.[11] Other products, like compostable plastic containers, may be technically recyclable or compostable, but they are often incompatible with most recycling and composting programs.[12]

Consumers lack opportunities to recycle and compost

Many municipalities lack curbside recycling, while in areas where it is provided, multi-unit apartments are often left out.[13] As a result of the recent restrictions on recycling exports, additional municipalities have ended their recycling programs. Access to curbside compost is even worse. A 2017 study found that only 326 municipalities out of more than 19,0000 had curbside pickup of food waste, less than 2%.[14] For these activities to increase, recycling and composting must be as easy as tossing things into the trash.

Plastic production has increased

For materials like metal and cardboard, the recycling model has historically worked well. There is a healthy market for used cardboard and aluminum, which reduces the environmental impact of extracting and manufacturing new so-called "virgin" materials.[15]

Plastic is different. Plastic can only be recycled a few times, because it breaks down each time it's recycled. Recycling plastic is also an expensive and complicated process.[16] As more non-recycled plastic has entered our waste stream, our recycling system has struggled to fund

itself. Over the last three decades, the amount of plastic entering our recycling system has increased dramatically. In 1980, 20,000 tons of plastic was recycled. In 2015, that number skyrocketed to more than 3 million tons. And yet, that same year, more than 5 million tons of plastic was burned, while another 26 million tons was landfilled.[17]

Without a market, 8 million tons of plastic waste will continue to find its way into the ocean every year.[18] Ultimately, the best way to handle our plastic waste problem is to dramatically reduce the amount of plastic being produced in the first place.

Consequences of our weak recycling system

In the absence of an effective recycling system, most U.S. waste is landfilled or incinerated instead of recycled, necessitating that new materials be extracted and manufactured.

Trash incinerators

In the wake of recycling export restrictions, many municipalities have begun incinerating their recycling streams instead, a process often termed "waste-to-energy." While touted by supporters as a "renewable" energy source, incineration is extremely harmful to both the environment and local communities. For every metric ton of plastic burned in an incinerator, 1,980 pounds of carbon dioxide (CO_2) equivalent are released—nearly 15 times more than a ton of plastic waste that is landfilled.[19]

The public health effects of incineration are also grave. Emissions include carcinogens and neurotoxins, as well as contaminants that can cause or aggravate respiratory problems, particularly among children, the elderly, and those with pre-existing respiratory problems.[20]

Landfills

Landfills are the most common way of getting rid of waste and, they also pose environmental and public health challenges. As waste, especially organic matter, breaks down in landfills, it generates the greenhouse gasses CO_2 and methane. Twenty percent of all human-caused methane, a greenhouse gas 84-87 times more potent than CO_2 over a 20-year period, has come from landfills.[21] [22] In addition, landfills can leak fluid that contains a "wide variety of hazardous, toxic or carcinogenic chemical contaminants" into groundwater."[23]

The need for more raw materials

When materials are incinerated or landfilled, more virgin materials are needed to create new products. Using virgin materials often entails significant environmental degradation. For example, extracting and transporting natural gas in the U.S. for virgin plastic production emits an estimated 9.5–10.5 million metric tons of CO_2 equivalent per year.[24] Much of this natural gas also comes from fracking, which uses around 3 million gallons of water per well and has been shown to pollute groundwater.[25]

State findings

In 2019, U.S. PIRG Education Fund gathered information from North Carolina, Virginia, Oregon, Pennsylvania, Maryland, Wisconsin, Minnesota, and Illinois. From this survey, it's clear that states vary widely in how successfully they have adjusted to recycling import restrictions in China and elsewhere, if at all. Broadly, states can be divided into three groups: those that have faced recent challenges, those that have always been challenged, and those that seem, for now, least affected.

Based on the latest data, recycling rates in Oregon, Virginia, and Pennsylvania have either declined or the collection of recyclables has been cut back. Recycling companies have increased costs in all three states since China's National Sword program was implemented.[26]

North Carolina, Illinois, and Wisconsin have been less affected by recent challenges, in part because their statewide recycling efforts were minimal to begin with. In 2016–2017, North Carolina's recycling and composting rate held at just 14.9 percent.[27] While statewide data is unavailable for Wisconsin and Illinois, data gathered from municipalities suggests that the amount of recycling and compost collected is below the national average.[28] [29]

Some states have weathered the recycling crisis thus far, including Maryland and Minnesota. From 2015 to 2018 Maryland saw its combined composting and recycling rate rise and reported cutbacks on recycling programs have been minor compared to neighboring Virginia and Pennsylvania.[30] [31] The amount of material recycled and composted in Minnesota rose 11% from 2016 to 2017.[32]

We found that states varied widely in how successfully they reduced the total amount of waste they generated. In 2017, Minnesota offset an increase in total municipal solid waste from 4.7 million tons in 2010 to 5.9 million tons in 2017 with higher recycling rates.[33] In other words, the state burned or landfilled roughly the same amount of trash in 2017 as it had in 2010, despite recycling more of it.[34] In contrast, North Carolina decreased the overall amount of waste

produced from 7.5 pounds per person per day in 2005–2006 to 5.5 in 2016–2017, partly due to local government waste reduction programs.[35]

Information about waste and recycling programs varies greatly between states. While some compile and produce detailed and up-to-date information, others publish almost nothing or provide inconsistent measurements. Michigan, Connecticut, and New Mexico were cut from this report due to a lack of available information. Pennsylvania's most recent available data is from 2016.[36] Data on Illinois and Wisconsin in this report was gathered from a few municipalities, but not enough was available to allow for a comprehensive statewide perspective. Federal recycling rates haven't been updated since 2015.[37] Overall, more up-to-date data collection at the state and federal level is badly needed on this subject.

Almost two years into East Asian waste export restrictions, many states are generating more waste and recycling less of it. While many policies and practices can increase recycling and reduce waste, states have not pursued the changes needed to handle this new situation.

Local Stories

The advent of chemical recycling, government subsidized incineration, microplastic pollution and a lack of recycling infrastructure are issues that affect many areas of the country. Below are case studies that exemplify these national issues.

Why does Minnesota burn so much trash?

Through regulation and financial assistance, Minnesota has supported trash incineration to the detriment of Minnesotans' health and the environment. The state has established a waste hierarchy that places incineration above landfills. Because of this hierarchy, Minnesota's regulators can pressure haulers to send their waste to trash incinerators that generate electricity, rather than to landfills.[38] Since these "waste-to-energy" plants require a constant stream of trash to remain financially viable, the state's regulations act as an indirect financial subsidy. Without intervention, cheaper landfills could drive these incinerators out of business.[39]

Trash incinerators also receive direct financial assistance. In 2010, the Hennepin Energy Recovery Center (HERC) accepted an operating subsidy of $1.8 million, which reflects nearly $5 per ton of waste burned.[40] In return, HERC has released noxious emissions into the local community and greenhouse gases. In 2017 alone, those included carbon monoxide (40 tons), CO_2 equivalent (179,943 tons), hydrochloric acid (42 tons), and nitrogen oxides, which are linked with asthma (412 tons).[41] [42]

Trash incinerators have also been supported by Minnesotans' trash collection bills, including the Red Wing Generating Plant, which released even more CO_2 equivalent (206,472 tons), carbon monoxide (103 tons), and nitrogen oxide (593 tons) in 2017.[43] In 2017, the Red Wing and HERC plants alone emitted greenhouse gasses equivalent to the average annual emissions of more than 76,000 cars.[44]

Instead of subsidizing the hazardous and wasteful process of incineration, the state could choose to invest in measures to reduce waste, improve recycling, and increase composting.

Wisconsin's preemption law allows for more microplastic pollution

Wisconsin's waste system has failed to protect the environment from plastic pollution, which is inundating Lake Michigan. In 2016, Wisconsin Gov. Scott Walker signed a pre-emption law banning local governments from acting to reduce single-use plastic waste, even as the extent of plastic entering the Great Lakes was becoming clearer.[45]

According to recent estimates from the Rochester Institute of Technology, 22 million pounds of plastic annually gets dumped into the Great Lakes annually, with the majority—11.6 million pounds—filling Lake Michigan.[46] After entering the water, this plastic will break down into microplastics and nanoplastics, which are long-lasting and have been found to hurt marine life in laboratory tests.[47]

In addition, microplastics are a large concern because the long-term effects to the environment and people are not yet known.[48] As long as Wisconsin and other states and Canadian provinces bordering Lake Michigan fail to tackle the overuse of plastics, they will be running a massive experiment on the lake and their residents' health.

Oregon battles with a false recycling solution

While all plastics present an environmental risk, polystyrene foam, popularly known as Styrofoam, is one of the most harmful. Its recycling options are even more limited than other common forms of plastic, and the substance often ends up as litter, eventually breaking down and polluting our land and oceans. This is why cities and states across the country are banning its use as a single-use food container.[49]

Last year, a statewide polystyrene ban lost by a single vote in the Oregon Senate. The measure was heavily opposed by the company Agilyx, which claimed polystyrene waste could be recycled in their facility.[50] A closer look reveals that Agilyx and other companies like it are sometimes more akin to fossil-fuel generators than recyclers. Instead of extracting fossil fuels from the ground in Alaska or Saudi Arabia, Agylix extracts fuel from plastics, a down-cycling process at best.[51]

As an alternative, banning polystyrene foam products in favor of better alternatives would prevent this problem entirely. Plastic-to-fuel initiatives, rather than allowing Oregon to protect the environment, are preventing actions to reduce plastic waste.

False waste solutions have been around for a long time, and local and state governments across the country continue to support these processes, despite the problems they cause. Plastic-to-fuel is a new false solution which could hold policymakers back from needed reforms. Avoiding these bad policies requires a broader understanding of our waste system and its impact on public health and the environment, and a reminder that we need to reduce and reuse, before we recycle.

A Virginia county invests in its recycling system

While municipalities in Virginia have instituted major cutbacks in collecting recyclable waste, Page County, located in northern Virginia, has gone a different direction. It has proven that good investments in infrastructure can improve recycling and waste management.

Page County purchased a baler, which compresses and packages material. This machine has made waste easier and cheaper to transport recyclables, and, by lowering transport costs, the county was able to expand the area they can send their recyclables to potential buyers.[52]

The program was so successful that it won an Achievement Award from the Virginia Association of Counties.[53] This success proves that there may be alternatives to ending recycling programs, and investing in infrastructure is one.

Solutions

Reduce, reuse, recycle.

Reduce, reuse, recycle. It's important to remember that recycling is only our third-best option. While recycling reduces our need to produce from virgin materials, it is also a manufacturing process that requires the use of water, energy, and other natural resources. For that reason, we need to redesign our systems to reduce and reuse, first and foremost. The following policies can help us reach our goals:

Reduce	Reuse	Recycle
Ban unnecessary single use plastics such as plastic bags and polystyrene foam food containers.	Pass Right-to-Repair Laws, giving consumers and independent repair shops the ability to fix their stuff when it breaks.	Pass Extended Producer Responsibility Laws that make manufacturers responsible for dealing with the waste their products ultimately become.
Require unnecessary single-use plastic accessories such as straws, utensils and condiment packets, to be given only upon customer request.	Encourage the use of reusable bags and bottles through customer rebates.	Expand curbside recycling and composting efforts.
Oppose the creation of new plastic production infrastructure.	Require sit-down restaurants to use reusable plates and foodware.	Mandate that new products contain a certain percentage of recycled material.
Enact "Pay As You Throw" programs that charge consumers less if they throw out less trash.		Ban food waste from landfills and encourage the creation of a comprehensive composting system.

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