Trash in America

Moving from Destructive Consumption to a Zero-Waste System

WashPIRG Foundation

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TOXICS ACTION CENTER

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Executive Summary

The United States produces an immense amount of waste.

Natural resources are continually extracted to produce goods that are used in the U.S. – often only briefly – before they are thrown into landfills, incinerators or the natural environment. This system of consumption and disposal results in the waste of precious resources and pollution that threatens our health, environment and global climate.

Because the costs of this system fall on society at large – not on the producers and consumers that drive it – there are few direct incentives for change.

To protect public health and the environment, conserve natural resources and landscapes, and address the mounting crisis of global warming, America should move toward an economic system characterized by zero waste. To achieve that goal, federal, state and local governments should enact policies and programs that incentivize shifting to a "circular," or "closed-loop," economy in which less is consumed and all materials are reused, recycled and composted in a continuous cycle.

The U.S. produces more than 30 percent of the planet's total waste, though it is home to only 4 percent of the world's population.[1] In 2014 alone, the U.S. threw out over 258 million tons of "municipal solid waste," or trash discarded by homes, businesses and institutions, such as universities and libraries.[2] A Columbia University study estimates that Americans throw out 7 pounds of materials per person every day – that's **2,555 pounds of materials per American every year**.[3] Those materials make up only 3 percent of all solid waste in America – the vast majority is generated by industrial processes such as mining, manufacturing and agriculture.[4]

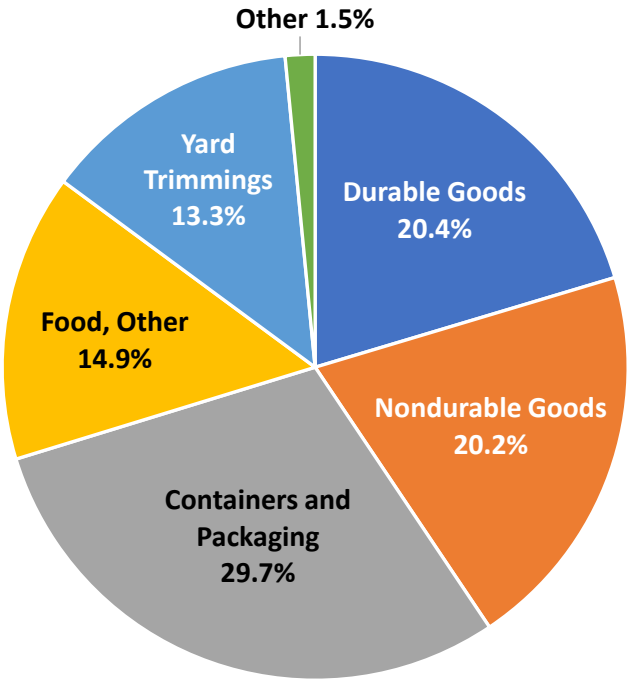
America's garbage largely consists of goods that are used only briefly.

- About 30 percent of all U.S. "garbage"[5] is packaging, which is of little use to consumers and is typically thrown out after a product is purchased.[6]

- Nondurable goods, such as clothing and newspaper, account for an additional 20

5 *In this paper, the terms "garbage" and "trash" will be used in place of "Municipal Solid Waste," which refers to materials discarded by homes, businesses and institutions, such as universities and government agencies.*

Figure ES-1. U.S. Garbage Composition by Product Category, 2014[8]



percent of U.S. garbage, with yard trimmings (13.3 percent) and food and other organic materials (14.9 percent), accounting for a substantial share as well.[7]

- The remainder (20.4 percent) of what homes and businesses throw out is made up of durable goods, like furniture and appliances, many of which could be repaired or repurposed, or have their materials recycled for other uses.

America's trash could be composted and recycled.

- **Food waste and yard trimmings** make up more than a quarter (28.2 percent) of the U.S.' garbage and are organic and easily compostable.

- **Paper and paperboard,** some of which could be composted and the rest of which could be recycled, also make up over a quarter (26.6 percent) of America's trash.

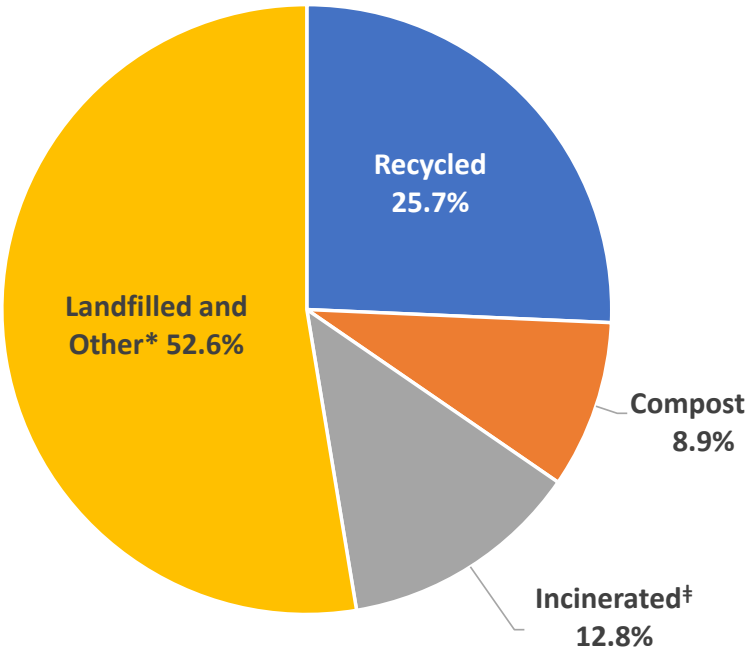
- **Plastics, metals and glass –** another quarter (26.3 percent) of America's garbage – are all readily recyclable.

- **Rubber, wood, leather, and textiles** make up the remainder (15.7 percent) of America's waste and can also be recycled into useful products.

Currently, though, the majority (65.4 percent) of materials discarded by homes and businesses in the U.S. are ultimately dumped into landfills or burned in incinerators. The U.S. only composts and recycles about half that much material at 34.6 percent.[9]

America's "linear" material economy, where materials are extracted, made into goods and disposed of in a one-way street, creates massive environmental and public health impacts.

Figure ES-2. U.S. Garbage Handling, 2014[10]



**"Other" refers to combustion without energy recovery.*
‡"Incinerated" refers to combustion with energy recovery.

- **Global warming pollution**:
  - **About 42 percent of all U.S. greenhouse gas emissions** are created in the process of extracting resources, producing goods, disposing of waste, and transporting materials at every stage of that process.[11] That is far more than transportation (26 percent) or electricity generation (31 percent), which are often cited as the sectors with the highest greenhouse gas emissions in America.[12]
  - Recycling materials uses less energy than producing new ones. Recycling in the U.S. in 2014 alone prevented more greenhouse gas emissions than 38 million passenger cars produce in one year.[13]
- **Air pollution:** Incinerator emissions include heavy metals and mercury, a neurotoxin that impairs brain function, as well as cancer-causing pollutants like dioxin, one of the most toxic substances known to humanity.[14] The extraction and production activities necessitated by dumping and burning materials also cause environmental degradation, air pollution and water contamination.
- **Water contamination**: When garbage, including incinerator ash, breaks down in landfills, the resulting liquids can leach into the environment and threaten drinking water supplies.
- **Ocean pollution**: An estimated 8 million tons of plastic ended up in the oceans in 2010 alone – this plastic persists for hundreds of years and can kill marine animals by entangling them, poisoning them or blocking their digestive tracts.[15] Marine debris is considered one of the great threats to biodiversity.[16]

- **Wasted natural resources**: It took 387 million trees to produce the amount of paper that was landfilled or burned in the U.S. in 2014 alone.[17]

- **Habitat destruction**: As 90 percent of all raw materials extracted for use in the U.S. are ultimately dumped or burned, more and more land is mined, logged and cleared for agriculture to continuously replace those materials.[18] An area the size of Mexico is farmed each year for food that is thrown away worldwide and about 900 million trees are cut down for U.S. paper and pulp mills every year – that's three trees for every American, each year.[19]

There are few direct incentives in America's system of consumption and waste handling to drive individuals and businesses to change their behavior.

The impacts of wasting resources, harming public health and the environment, and endangering future generations through global warming are paid for by society, not by the producers and consumers that drive this system. Because these costs are not embedded in the price of making, purchasing or disposing of goods, there aren't direct incentives for people and businesses to change.

- Producers have few direct incentives to build products to last, to make them easy to repair, to use less packaging, or to make their goods or packaging easy to reuse, recycle or compost. In fact, it is often beneficial for producers to make goods intended to be used once or temporarily so that consumers continually buy more.

- In places where consumers do not directly pay to throw out their garbage, or they pay the same fee regardless of how much they throw out, there are not direct incentives to waste less.

- Producers, waste haulers and landfill and incinerator operators all have a stake in the U.S. waste system continuing to operate as it does now and have lobbied against changes.

America has the tools to shift away from this wasteful, polluting and costly linear system to a circular materials economy that produces zero waste, conserves natural resources, and limits pollution and global warming emissions.

By taking the following steps, the U.S. can transition to a circular economy in which zero waste is created. These steps can be promoted through a variety of policies and programs at the local, state and national levels.

1. Set a goal to achieve zero waste.

2. Make recycling and composting mandatory, universally accessible and less expensive than garbage disposal.

3. Encourage goods to be built to last and easy to reuse, repair, recycle or compost.

4. Ban the sale of single-use items that are not easily recyclable or compostable, including packaging, plastic bags and food service ware.

5. Require producers to take more responsibility for their products during their entire life cycle.

6. Ensure that repair, reuse, recycling, and composting facilities exist to handle the materials stream.

7. Encourage producers to use recycled and reused materials in new products.

8. Price goods to reflect the environmental and public health impacts of their production.

9. As waste is eliminated, ensure that all remaining waste is disposed of safely.

10. Oppose the construction, expansion and subsidization of landfills and incinerators.

A zero-waste economy is possible.

By reducing consumption, increasing the reuse and repair of goods, and recycling and composting all remaining materials, the U.S. can create zero waste. U.S. cities and states, as well as other countries, are already taking strides toward creating zero waste.

- The city of **San Francisco** now diverts **80 percent** of disposed materials from landfills and incinerators thanks to its "Zero Waste by 2020" program.[20] This initiative includes many programs and ordinances, such as a requirement that residents and businesses sort their waste into recycling, composting and garbage bins.[21]

- The state of **Vermont** passed the Universal Recycling Law in 2012, which will phase in policies and programs until all recyclables, leaf and yard debris, food scraps, and other organics are banned from landfills in **2020**.[22]

- Thanks to a variety of policies and programs, such as making manufacturers responsible for disposing of packaging, **Germany** now recycles and composts **87 percent** of discarded materials and has no active landfills.[23]

Introduction

Every morning, Americans across the country stop at a local shop for a cup of coffee – usually served in a disposable cup.

We use the cup while we drink our coffee and then toss it in the trash. The time it takes to drink our coffee, though, is just a brief moment in the history of the materials that went into the creation of the cup – and the degradation of those materials in the environment after it is thrown away.

To produce coffee cups, trees must be cut down and oil extracted from the ground. Those raw materials must be transported to a factory to make paper and plastic, which are then often transported to another factory to be manufactured into a coffee cup. The coffee cup is packaged up with others (often in more paper or plastic) and shipped – often over long distances – to a distributor and finally to a coffee shop.

At the coffee shop, somebody purchases the cup with their coffee and, after drinking it, promptly throws the cup away.

The cup, which is likely not recyclable or compostable, will then be taken with other trash and burned in an incinerator or dumped in a landfill, where the plastic will break down into smaller and smaller bits, but will persist in one form or another, indefinitely.

This process repeats 63 million times every day in America; 441 million times each week and 23 billion times every year.[24]

The story of disposable coffee cups illustrates the absurdity at the center of America's material economy. Natural resources that have taken years or even millennia to create are extracted in order to create goods that are used for mere moments before they are discarded. These materials then persist in the environment as pollution for decades to centuries. Every step in this process has the potential to degrade the environment and create pollution that harms our health and contributes to global warming.

So, why does this system continue? For the most part, it's because its effects – waste management costs, public health threats, natural resources loss and global warming – are paid for by all of us, collectively, and are displaced from the process of making and buying things.

Coffee cups litter the sidewalk by an overflowing trash can. The U.S. discards 63 million coffee cups every day, most of which aren't recyclable or compostable. Photo Credit: Hat4Rain via Flickr, CC BY 2.0.

Because these costs aren't embedded in the price of producing or purchasing something, there are no direct incentives for change. Coffee chains pay peanuts for coffee cups, don't typically pay to dispose of them, and fear that sales would go down if they required customers to carry their own reusable cups. Consumers who buy coffee also don't pay to dispose of the cups, so they have no incentive to bring their own reusable cups. Manufacturers do not have to pay to dispose of the cups either, so they have no incentive to make their cups recyclable or compostable – most are made by lining a paper cup with plastic and the two materials too hard to separate to recycle. So, even consumers who take it upon themselves to try to recycle the cups may wind up frustrated.

There is a better way.

There are proven, common-sense policies that can be enacted at the local, state and national levels that can change this system. For example, San Francisco now requires that all food service packaging sold in the city, like coffee cups, be recyclable or compostable; the states of Hawaii and California and countless communities across the U.S. have banned plastic bags from grocery stores; and Germany has shifted responsibility for the entire life-cycle of packaging to producers, which has dramatically increased recycling rates.[25]

By coming to grips with our nation's absurd, linear materials economy, and by putting the right policies and signals in place, America can move toward a more sustainable future.

An Overview of Solid Waste in America

How Much Solid Waste Does the U.S. Produce?

The U.S. produces more than 30 percent of the planet's total waste, though it is home to only 4 percent of the world's population.[26] Almost all of this waste – 97 percent – is created by industrial processes like mining, manufacturing and agriculture, but complete, up-to-date accountings for industrial waste do not exist.

Based on available data, the categories of solid waste in America, ranked by size are:

1. **Industrial** solid waste: approximately 7.6 billion tons per year (1987 EPA estimate).[27]

2. **Mining and mineral processing** solid waste: 1.8 billion tons per year (early 1990s estimate).[28]

3. **Construction and demolition** debris: 534 million tons in 2014.[29]

4. **Municipal** solid waste or "**garbage**"‡ from homes, businesses and institutions: 258 million tons of garbage in 2014.[30]

5. **Hazardous** waste handled by the Resource Conservation Recovery Act (RCRA): ranged from 20.3 to 28.8 million tons per year from 2001 to 2011.[31]

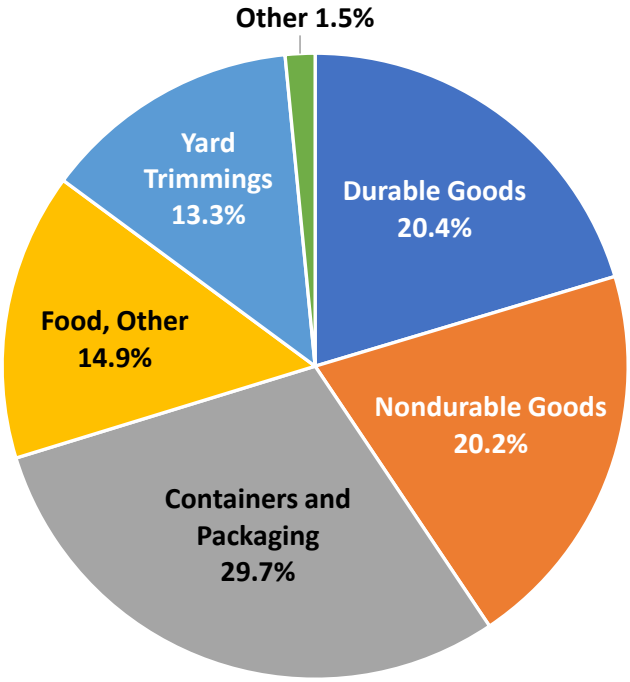
6. **Oil and gas production** solid waste: 286,600 tons per year (1990s estimate).[32]

7. **Mixed wastes**, which include both **radioactive and hazardous** components: About 2,600 tons are handled each year at two facilities in the U.S. specially designed for such wastes.[33]

Americans produce more garbage in their homes, businesses and institutions, such as schools and government offices, than citizens of any other developed country. The EPA estimates that Americans throw out 4.4 pounds of material per person every day, while a Columbia University study estimated that the figure was nearly twice as high: 7 pounds of materials

‡ *In this paper, the terms "garbage" and "trash" will be used in place of "Municipal Solid Waste," which refers to materials discarded by homes, businesses and institutions, such as universities and government agencies.*

Figure 1. U.S. Garbage Composition by Product Category, 2014[38]



per person every day or 2,555 pounds of materials per person every year.[34]

Households, businesses and institutions only throw out 3 percent of all U.S. solid waste, but this consumption and subsequent disposal of goods drives the continual extraction and production activities that generate the other 97 percent.[35] If fewer materials were consumed and if discarded materials were reused, recycled and composted, there would be far less need to extract and produce new materials.

What Does America Throw Away?

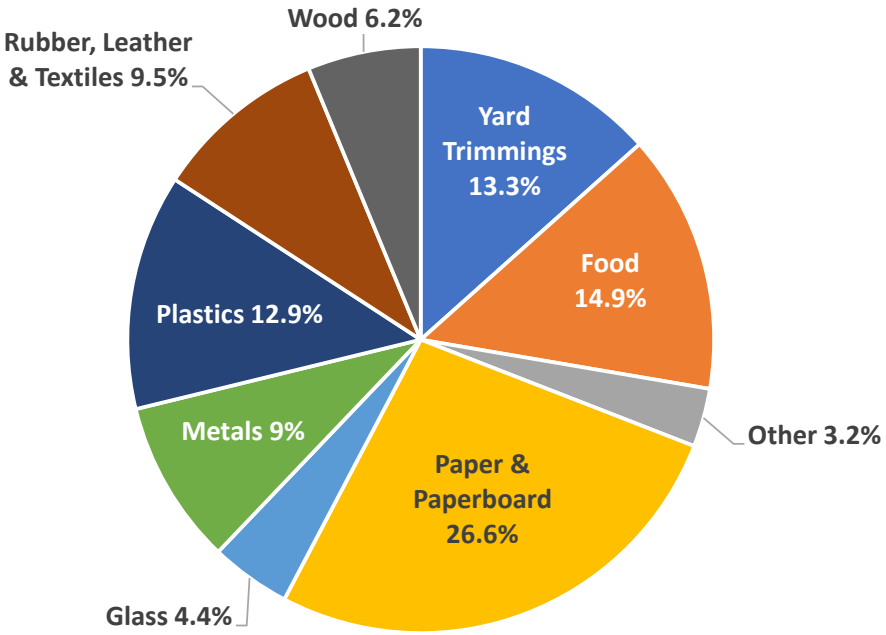
The materials thrown out in the U.S. are largely comprised of goods that are used only briefly – for example, about 30 percent of all U.S. garbage is packaging.[36]

Packaging is the most commonly thrown out item – making up 29.7 percent of U.S. garbage.[37] In other words, nearly one-third of U.S. garbage is generated by materials of little direct use to the consumer. Consumer goods comprise 40.6 percent of garbage – split roughly between durable goods, like furniture and appliances, which are intended to last, and non-durable goods, like newspaper and clothing, which are intended to wear out.

The key components of U.S. municipal garbage are as follows:

1. Packaging: 29.7%
2. Durable Goods (e.g.: furniture, appliances): 20.4%
3. Nondurable Goods (e.g.: clothing, newspaper): 20.2%
4. Food, Other: 14.9%
5. Yard Trimmings: 13.3%
6. Other Goods: 1.5%

Figure 2. U.S. Garbage Composition by Material, 2014[39]



More than one-quarter of discarded materials are organic, and are therefore compostable, while over half are reusable or recyclable. The components of U.S. municipal garbage include:

1. Organic Material (Food & Yard Trimmings): 28.2%
2. Paper & Paperboard: 26.6%
3. Plastics: 12.9%
4. Rubber, Leather and Textiles: 9.5%
5. Metals: 9.0%
6. Wood: 6.2%
7. Glass: 4.4%

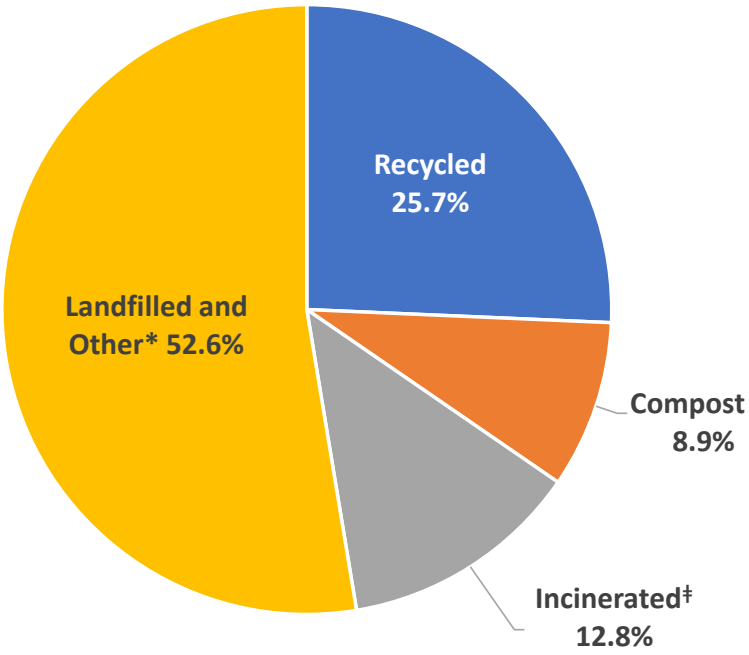
What Does the U.S. Do With its Garbage?

Nearly two-thirds – 65.4 percent – of materials thrown out in the U.S. are ultimately dumped into landfills or burned in incinerators. About half that much material – 34.6 percent – is composted and recycled. A great deal of unaccounted-for trash also ends up loose in the environment in the form of litter.[40]

Because most discarded materials are dumped or burned, there are currently over 2,400 landfills and more than 108 incinerators in the U.S.[42]

The U.S. has made progress in keeping certain types of materials out of landfills and incinerators. For example, several states have paint product stewardship laws, which require paint manufacturers to create programs individually or collectively that make it easy for consumers to drop off their leftover paint.[43] The manu-

Figure 3. U.S. Garbage Handling, 2014[41]



**"Other" refers to combustion without energy recovery.*
‡"Incinerated" refers to combustion with energy recovery.

facturers then must find opportunities for the paint to be reused or must dispose of it in an environmentally safe way.[44] The U.S. also composts 60 percent of yard waste because many communities have specific yard trim pick-up programs.[45]

Other types of discarded materials that are not regulated and do not have collection programs have low recycling rates. For example, citizens are typically responsible for finding collection services for household hazardous wastes like electronics and this results in low recycling rates.[46]

Some discarded materials never make it to a recycling center, landfill or incinerator, but wind up loose in the environment, including in the oceans. All of the world's oceans now contain huge patches of floating garbage. The Eastern Pacific Garbage Patch, for example, is estimated to be about twice the size of Texas and the Southern Pacific Garbage Patch is roughly the size of Mexico.[47] In 2014, a study estimated that there were up to 245,000 tons of floating trash in the world's oceans.[48] Most of this garbage does not float, though, and an estimated 8 million tons of plastic ended up in the ocean from coastal countries during 2010 alone.[49]

What Are the Impacts of America's Waste System?

America's linear economy and waste system create massive environmental and public health impacts.

Global Warming

The U.S. generates more greenhouse gas emissions than any country other than China and thus bears a large amount of responsibility for addressing the crisis of global warming.[50] The activities that the U.S. waste system perpetuates – extracting resources, producing goods, disposing of waste, and transporting materials at every stage of that process – collectively produce **42 percent of all U.S. greenhouse gas emissions**.[51] That is more than any sector traditionally cited as the largest contributor to climate change, such as transportation (26 percent) and electricity generation (31 percent).[52] Cutting back on these activities by consuming less and by reusing, repairing, recycling and composting materials would therefore be one of the most effective strategies to cut global warming pollution.

The consumption of goods that require cutting down trees are doubly impactful because trees absorb carbon from the atmosphere while alive. Making paper from virgin materials for 20 average U.S. office workers produces 8.69 metric tons of CO_2 each year – equivalent to burning over 9,508 pounds of coal.[53]

Using recycled materials instead of virgin materials for manufacturing generally saves energy, producing less global warming pollution.[54] Recycling in the U.S. in 2014 prevented more greenhouse gas emission than 38 million passenger cars produce in a year.[55]

Transporting waste away from households and businesses and pushing it around landfills usually requires diesel-powered vehicles. There is not good data on the total amount of global warming pollution that garbage transportation creates, but one 2003 study found that garbage trucks averaged only 2.8 miles per gallon and logged 3.4 billion miles of travel per year, more than all U.S. transit buses combined.[56] By our calculation, these garbage trucks would emit about 12 million metric tons of carbon dioxide per year – more than the emissions generated by energy use in 1.2 million homes for a year.[57] As landfills reach capacity, waste needs to be transported ever greater distances, compounding this problem. For example, much of New York City's garbage needs to be hauled out of state to places as far away as Ohio and West Virginia.[58]

Our waste continues to contribute to global warming once it reaches landfills. Food waste and yard trimmings, which make up 29.5 percent of what is sent to landfills, often do not decompose in the dark, low-oxygen conditions there.[59] Instead, their degradation in landfills produces methane, a greenhouse gas at least 34 times more potent than carbon dioxide.[60] Landfills generate 2 percent of total U.S. greenhouse gas emissions.[61] If these organic materials were composted instead, they could decompose and reduce landfill methane emissions. Composting also enhances soil, helping microorganisms and plants to grow, which act as carbon sinks – further reducing global warming pollution.

Air Pollution

Incinerators work by burning waste material at extremely high temperatures, producing ash and air pollution. Some of these emissions include cancer-causing and highly toxic pollutants like dioxin, which can cause skin, blood, liver and reproductive problems.[62] Incinerators also release heavy metals and mercury, a neurotoxin that impairs brain function.[63]

Landfills release toxic air pollution, too. Construction and demolition debris that

Air pollution from the Blue Ridge paper mill in the town of Canton, North Carolina. Because the vast majority of manufactured materials in the U.S. are ultimately dumped or burned, new materials, such as paper, need to continually be made through processes that create air, water and global warming pollution. Photo Credit: Doug Bradley via Flickr, CC BY-NC-ND 2.0.

contains drywall can produce toxic hydrogen sulfide gas in landfills.[64] Hydrogen sulfide is a colorless and highly flammable and explosive gas that smells like rotten eggs.[65] Hydrogen sulfide can cause eye and skin irritation; respiratory, cardiovascular, neurological and other problems; cancer; and, in cases of acute exposure, death.[66]

Dumping and burning garbage rather than reusing and recycling materials necessitates perpetual extraction, production and transportation activities, which all create air pollution, too.

Water Contamination

The liquid that filters through landfills – from rainwater, liquid found in garbage, or (when landfill liners leak) groundwater – collects contaminants from throughout the landfill and produces what is called leachate. Some of the chemicals in leachate react with one another and the environment to form new contaminants. Toxic leachate can threaten drinking water supplies, even with modern plastic liners.[67] Of particular concern is the fact that leaching liquids can contain hazardous waste. Old cell phones and other discarded electronics contain cadmium, lead and mercury, which are known human health hazards.[68] There are special landfills and recycling programs for hazardous waste, but they tend to be inconvenient and requirements to use them are often poorly enforced, so a lot of hazardous waste is thrown out with regular trash.[69]

It is common practice to collect leachate for wastewater treatment and release it into surface waters. But a study by the U.S. Geological Survey found that even after leachate was treated through such practices, it still contained contaminants in unsafe levels.[70]

In 2015, a Federal District court ruled

All of the world's oceans now contain huge patches of floating garbage – one about the size of Mexico. Marine debris can poison and entangle animals and block their digestive tracts, causing starvation. Photo Credits, clockwise from top left: Bo Eide via Flickr, CC BY-NC-ND 2.0; International Fund for Animal Welfare via Flickr, CC BY-NC 2.0; Florida Fish and Wildlife Conservation Commission, taken under NOAA research permit #15488, via Flickr, CC BY-NC-ND 2.0; U.S. Fish and Wildlife Service Headquarters via Flickr, CC BY 2.0.

that the Camelot Landfill posed "an imminent and substantial endangerment to the drinking water supplies" of nearby Lewisville, Texas.[71] The contamination found in the town's drinking water included chlorinated hydrocarbons, which can impact central nervous system function and cause liver and kidney damage, cancer and heart arrhythmia.[72] Lewisville's drinking water supply also contained heavy metals, which can cause an array of health effects including kidney damage, bone damage, cancer and impaired brain and nervous system function.[73]

A study of the Woodlawn landfill, a Superfund site in Maryland, found toxic vinyl chloride in nearby groundwater at levels more than 50 times above drinking water standards and thousands of times higher than what is considered to prevent cancer with lifelong exposure.[74] The landfill ceased operations in the early 1980s, but the study found that, due to continual leaching of pollutants into the groundwater, the contamination was not diminishing, even as late as 1997.[75] Vinyl chloride is carcinogenic and can cause liver damage, nerve damage and circulatory problems, as well as other effects.[76]

Ocean Pollution

Much of our trash ends up loose in the environment and eventually in the ocean via stormwater runoff, as a result of littering onshore and at sea, and illegal dumping. Because of this, all of the world's oceans now contain huge patches of floating garbage. The Eastern Pacific Garbage Patch, for example, is estimated to be about twice the size of Texas and the Southern Pa-

cific Garbage Patch is roughly the size of Mexico.[77] In 2014, a study estimated that there were up to 245,000 tons of floating trash in the world's oceans.[78] Most of this garbage does not float, though, and it was estimated that 8 million tons of plastic in total ended up in the ocean from coastal countries in 2010 alone.[79]

Much of the trash that persists in the oceans is plastic. Plastics break down at varying rates into smaller and smaller pieces and eventually into harmful chemicals, which persist indefinitely.[80] Much of the plastic in the oceans is in bits about the size of plankton, while some is in larger pieces, closer to their original forms. All of these bits of plastic are harmful to marine species and marine debris is considered to be one of the major causes of species extinction.[81]

Marine mammals frequently ingest the plastic, mistaking it for food or consuming it inadvertently. Smaller pieces of plastic and chemicals resulting from their degradation are toxic and can harm or kill marine animals.[82] Larger pieces of plastic can block animals' digestive tracts, causing starvation. One study found that over 60 percent of the contents of dead sea turtles' digestive tracts were plastics.[83] This is a problem for people who eat seafood, too. One study found that seafood eaters consume up to 11,000 microplastic particles every year, some of which accumulate in the body over time and may lead to long-term health impacts.[84]

Larger pieces of plastic can also harm or kill marine animals by entangling them. Studies published before 2012 collectively document 57,000 cases of debris entanglement of seals and baleen whales alone.[85]

Wasted Natural Resources

As 90 percent of all raw materials extracted for use in the U.S. are ultimately landfilled or incinerated, more and more resources have to be extracted to replace those materials and produce new goods all the time.[86]

It took 387 million trees to produce the amount of paper that was landfilled or burned in the U.S. in 2014 alone.[87] It will take just as many trees to replace that material each year, when it could be recycled instead.

In 2014, the U.S. only recycled 9.5 percent of its discarded plastic and landfilled and burned over 30 million tons of it. Continual oil extraction will be required to produce that quantity of plastic each year, when, again, it could be recycled instead.[88]

This principle applies to all of the trace minerals and other natural resources that go into products, the vast majority of which are used only once or temporarily.

Habitat Destruction

America's one-way consumption and disposal system also causes habitat destruction.

Every year, 900 million trees are cut down for American paper and pulp mills, many to produce packaging.[89] That is three trees per American, every year.[90] Forests sequester carbon and house rich ecosystems and natural resources that have value far beyond modest conveniences like packaging.

Land is often converted to farmland at the expense of biodiverse forests and critical ecosystems, such as the Amazon and Indonesian rainforests, which are being destroyed for agriculture and palm oil production, respectively. These habitats are critical to planetary health and are being destroyed to produce food, much of which is ultimately wasted. Globally, an area the size of Mexico is farmed each year for food that is thrown away.[91] Because America's food comes from around the world, much of this habitat destruction in other parts of the world is due to American consumption – the average American family spends $1,600 every year on food that does not get eaten.[92]

Why Does the U.S. Throw Out So Much Stuff?

The U.S. throws out immense amounts of materials because material goods are relatively cheap to produce and consume, most goods are made to be used once or temporarily, and there are few direct incentives to repair, reuse, recycle and compost materials.

Goods Are Cheap

Prior to the 20th century, households generated minimal amounts of waste. It wasn't until the late 19th century, for example, that New York began to develop the nation's first comprehensive system of municipal waste collection and disposal.[93]

Before the 20th century, obtaining raw materials was daunting and costly, manufacturing was relatively inefficient, and most people's incomes were low. Packaging was minimal and was often reused for other purposes in the home. Waste was limited because it made economic sense to only buy what you needed, to repurpose everything, and to produce and purchase durable goods that could be easily repaired.

As the 20th century progressed, however, products became more affordable and disposable, and incomes rose, so the barriers to waste fell.

Products became more affordable for several reasons. First, technological advances made the extraction of raw materials cheaper and easier, thus lowering their costs. The cost of industrial minerals, for instance, dropped 43 percent on average from 1900 to 2000, accounting for inflation.[94] Second, new, cheaper materials became available. Modern plastics, most importantly, were invented in the early 1900s and became very inexpensive to produce and ubiquitous as the century progressed. Lastly, most industries, inspired by Henry Ford's assembly line, adopted the practice of mass production, which lowered production costs.

At the same time that product costs were falling, people's incomes were rising, further lowering the barriers to consumption and waste production. The median household income in the U.S. more than doubled in 50 years from $20,102 (in 1997 dollars) in 1947 to $44,568 in 1997.[95]

Most Goods Are Made to Be Used Once or Temporarily

Lower costs and higher incomes allowed more Americans to more easily fulfill their desire for products. To continue to stimulate growth, however, producers came up with creative strategies to expand consumers' definition of their needs to keep them purchasing.

Cheap plastics inspired the invention of disposable goods and packaging. These products, which didn't exist a century ago, are now so ubiquitous that nearly one-third of all materials thrown out come from packaging.[96] In 1956, the editor of National Packaging Magazine declared "the future of plastics is in the trash can."[97] He urged the plastics industry to stop thinking about reusable products and instead to focus on single-use products – things that can be used once and thrown away – because that would create a never-ending sales opportunity. It required behavior change for people to start using disposable goods, but advertising campaigns were effective and now red solo cups and plastic forks are American staples.

Disposability even began to extend to durable goods. "Planned obsolescence" was thought up in the 1920s, when the national automobile market reached saturation. General Motors famously started introducing new design models every year to convince consumers that their cars were out of date so that they would buy new ones. Today, this practice has extended to fashion, smartphones, home décor, and a multitude of other items.

Planned obsolescence doesn't just refer to items going out of style. One might

think that technological advances would lead to longer-lasting products, but that hasn't necessarily been the case. Manufacturers often make products designed to wear out so that they need to be replaced regularly. For example, a German environment agency study revealed that in 2004, 7 percent of large household appliances, like washing machines, were purchased to replace an appliance that had become defective within just five years of being purchased.[98] In 2013, just nine years later, that portion had almost doubled to 13 percent of large household appliances purchased.[99]

Food waste is another largely modern practice. The U.S. currently wastes 40 percent of the food it produces.[100] This waste is in large part due to the development of new fertilizers and pesticides and the spread of industrial farming in the 20th century, which have made it cheaper to produce and consume food. Accounting for inflation, milk, ham and sugar in 2013 cost less than half what they did in 1913, rice cost one-third what it had, and eggs cost only one-quarter what they had a century ago.[101] It is now cost-effective for producers and distributors to throw away food that does not meet high aesthetic standards and to transport food long distances with some of it spoiling along the way. The relatively low cost of food also allows people to buy more than they eat – the average American family spends $1,600 every year on food that does not get eaten.[102]

There Are Few Direct Incentives to Repair, Reuse, Recycle and Compost

America's wasteful system of consumption and disposal continues – even though it harms public health and the environment, wastes natural resources, and contributes to dangerous global warming – because its true costs are spread across society and even across generations. These costs are not felt directly by the producers and consumers that create the problem and thus don't inspire participants in the system to change their behavior.

Producers are typically not responsible for the goods they produce once they are purchased or their warranty runs out, so they do not have to pay to dispose of those goods if they are ultimately thrown out. Producers, therefore, have little incentive to build products to last, to use less packaging, or to make their goods or packaging easy to repair, reuse, recycle or compost. In fact, it is often beneficial for producers to make goods intended to be used once or only temporarily so that consumers continually have to buy more.

Many groups have a vested interest in keeping this system as it is. Manufacturers, distributors, retailers, waste haulers, and incinerator and landfill operators have all lobbied against measures to limit waste like bottle bills, bag bans and recycled packaging content requirements and have lobbied for expansions of their facilities.[103]

In some communities, consumers do not directly pay to throw out their garbage, or they pay the same fee regardless of how much they throw out, so they also have no direct incentives to repair, reuse, recycle, and compost instead of throwing everything in the garbage.

The broader costs of this system – the harm to public health and the environment, the waste of resources, and the endangerment of future generations through global warming – are also displaced and largely invisible. Even Americans who feel the public health impacts of this system or who see the loss of natural areas, may not draw the connections between these burdens and the fact that so many materials are discarded in the U.S.

Moving America to Zero Waste

America has the tools to shift from a wasteful, polluting and costly linear economy to a circular materials economy that produces zero waste.

Students sort their waste at a University of California Irvine sustainability event. Composting and recycling should be mandatory, less expensive than garbage disposal and available everywhere there are trash services – at home, school, work, and in public. Photo Credit: UCI Sustainability via Flickr, CC BY-ND 2.0.

Zero Waste Is Possible

By consuming less, reusing more and redesigning products to be long-lasting and easy to repair, recycle or compost, the U.S. can move toward creating zero waste.

The U.S. currently only diverts 35 percent of discarded materials from landfills and incinerators, but U.S. cities and states, as well as other countries, are taking strides toward zero waste. The following are examples of a city, state and country that are leading the drive toward zero waste – demonstrating the effectiveness of programs and policies that others can adopt to move toward a circular materials economy.

City Leadership: San Francisco

The city of **San Francisco** set a goal of achieving "Zero Waste by 2020" in 2002 and now **diverts 80 percent** of discarded materials from landfills and incinerators.[104] This progress has been achieved through a variety of requirements and programs.

- Every business and resident has three bins for waste:
    - Blue for recyclables
    - Green for organics
    - Black for other garbage
- Residents pay monthly fees for their waste disposal and are charged extra fees for throwing out more than a certain amount in a given month. This practice, typically referred to as "Pay as You Throw," incentivizes residents to consume and dispose less.
- Residents pay twice as much for garbage as for recycling and composting services and can save money by reducing the size of their garbage bins or the frequency with which their garbage is picked up. This encourages residents to compost and recycle everything they can.
- Packaging and food service ware, like plastic forks, that are sold in San Francisco must be recyclable or compostable.
- All checkout bags cost 10 cents and must be reusable, recyclable or compostable.
- Construction and demolition projects must use city-registered haulers and processors, which follow protocols to increase the reuse and recycling of debris.
- Purchasing of bottled and packaged water is discouraged through a series of ordinances.
- New buildings with water fountains must also have water bottle filling stations.
- Products regularly purchased by the city must have recycled content.
- Public works projects must use recycled-content construction materials.

The city employs a variety of enforcement tactics that have been key to the program's success. For example, the city will not pick up contaminated waste bins and will issue fines if residents or businesses continually mis-sort their waste.[105]

San Francisco's zero waste program has been an all-around success. The entire program – from public outreach efforts to hazardous waste collection – is funded through the fees that residents pay to throw out their waste.

State Leadership: Vermont

The state of Vermont passed a Universal Recycling Law in 2012 that phases in landfill bans over a six-year period.[106] By 2020, **all recyclable and compostable materials will be banned from the landfill** with a goal of reducing landfill waste by 25 percent by that time.[107]

- "Pay as You Throw" (PAYT), in which residents are required to pay to dispose of trash by weight or volume is mandatory throughout the state.
- Recycling bins must be provided everywhere there are trash bins.
- Businesses and institutions that produce large amounts of organic waste must compost it if a composting facility exists within 20 miles of their location.
- All transfer stations and drop-off facilities must accept recycling, leaf and yard debris and food scraps.

Vermont is a rural state, so its program can serve as a model for other rural parts of the U.S. During the first measurement period for the program, from 2014 to 2015, trash disposal decreased and recycling and composting rates increased.[108]

PAYT has been a particularly powerful incentive. Just six months after the town of Vernon, Vermont adopted its PAYT

program, it disposed of 58 percent less garbage on average per week.[109] Vernon expects the program will save the town $140,000 per year.[110]

Vermont's recycling program has also led to an unexpected benefit. Because large producers of organic waste, like grocery stores and schools, are required to divert their organics to composting facilities, many are pulling food off the shelves a bit earlier and donating it instead. The Vermont Foodbank reported that food donations increased 25-30 percent in 2015 and another 40 percent in 2016.[111] The quality of food donations has also dramatically improved to include far more fresh foods, like fruits, vegetables and meat.[112]

Vermont also has strong Product Stewardship, or Extended Producer Responsibility, laws, which aim to make producers responsible for their products once consumers are done with them. For example, Vermont has the country's first primary battery law, passed in 2016.[113] This law makes the manufacturers of small, non-rechargeable batteries sold within Vermont responsible for their safe disposal.[114] A strong Architectural Waste Recycling bill, which passed in 2015, diverts much of the construction and demolition waste from landfills and incinerators in Vermont.[115]

National Leadership: Germany

Thanks to policies and programs like the ones below, **Germany** now recycles and composts 87 percent of its garbage, incinerates the remaining 13 percent, and has no active landfills.[116]

- Residents pay much more to dispose of garbage than separated recyclables and organic waste.

- Organics are picked up weekly, paper and packaging are picked up biweekly, and garbage is only collected monthly. This creates an incentive to sort waste properly and to consume goods that can be recycled and composted, so that waste does not pile up in one's home.

- There are uniformly colored bins throughout the country for food waste (brown), paper (blue), packaging (yellow), and garbage (black). This simple, universal system makes sorting easy and habitual.

- If residents do not sort their waste properly, "oops" stickers are put on their bins and they are eventually fined to incentivize compliance.

- Grocery stores are required to collect materials that are hard to dispose of. This has reduced the amount of packaging used and has caused producers to make packaging much easier to recycle.

- Construction debris must be sorted by particular standards before it is disposed of, so it can be easily reused or recycled.

Steps to Achieving a Zero-Waste System

The material economy in the U.S. is linear – natural resources are extracted to produce goods, which are purchased, used and ultimately thrown out. Because most materials are ultimately dumped or burned, this process must repeat from the extraction stage to replace those lost materials. Extract, produce, consume, throw out, repeat – this system is effectively a one-way pipeline that converts natural resources into ever-growing piles of garbage and plumes of incinerator smoke.

It doesn't have to be this way.

Figure 4. Material Economic Systems– Linear Versus Circular

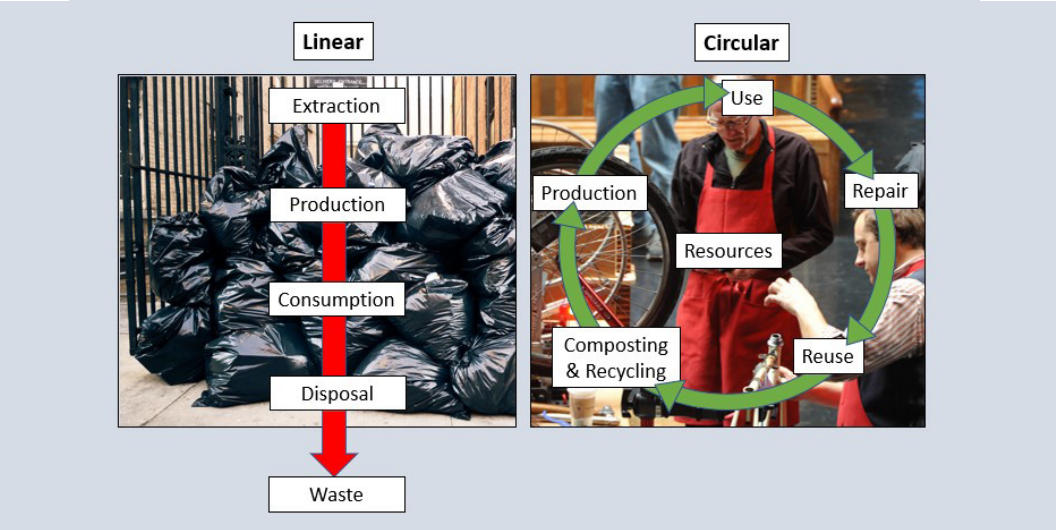


Photo Credit: Adapted from photos by Charley Lhasa (left) and Gregory Hayes (right), via Flickr, CC BY-NC 2.0.

America can create a circular material economy that produces zero waste. The Zero Waste International Alliance established a peer-reviewed, internationally accepted definition of zero waste to help guide businesses, institutions and communities in creating zero-waste goals.

"Zero Waste is a goal that is ethical, economical, efficient and visionary, to guide people in changing their lifestyles and practices to emulate sustainable natural cycles, where all discarded materials are designed to become resources for others to use.

Zero Waste means designing and managing products and processes to systematically avoid and eliminate the volume and toxicity of waste and materials, conserve and recover all resources, and not burn or bury them.

Implementing Zero Waste will eliminate all discharges to land, water or air that are a threat to planetary, human, animal or plant health."[117]

This goal can be achieved by replacing the wasteful linear material economy with a circular, or closed-loop, economic system. In this system, less would be consumed, products would be built to last and be easy to repair and, once they fulfilled their original purpose, would be easily reused, recycled or composted, eliminating the need for harmful landfills and incinerators. Then, new products would be made using the reused and recycled materials, replacing the need for harmful and wasteful extraction processes.

The following steps can help create a zero-waste economy and can be promoted through a variety of policies and programs at the local, state and federal levels.

1. Set a goal to achieve zero waste.

A zero-waste goal is a critical step in driving the adoption of policies and practices that can achieve that aim. It is not enough to set goals to increase recycling and composting rates. To achieve zero waste, products will need to be made using reused and recycled materials and be built to last and easy to repair, reuse, recycle or compost. And it will take policies and support for programs, research and infrastructure to make all of that possible.

2. Make recycling and composting mandatory, universally accessible and less expensive than garbage disposal.

Mandatory recycling and composting laws are among the most effective ways to reduce waste. Through these laws, residents, businesses and institutions are required to recycle and compost all appropriate materials. The burning of plastics for energy recovery should not be considered recycling.

To enact these laws, recycling and composting services must be made available everywhere there are garbage disposal services – at home, work and in public. The state of Vermont, for example, now requires that recycling bins be provided everywhere there are trash bins as part of its Universal Recycling Law.

The success of mandatory recycling and composting programs depends on public education. For instance, in implementing its Universal Recycling Law, Vermont has established an education program in public schools that provides support and materials for teachers, such as sample lesson plans.[118] This program aims to make recycling and composting second nature for children, so that they will influence their families at home and carry this behavior into adulthood.

Mandatory recycling and composting laws need to involve a system of accountability to be effective. In some places, waste haulers can be fined for continually dropping off excessive quantities of garbage in their recycling and composting loads or vice versa. Residents, businesses and institutions can also be issued warnings and fines when they do not sort their waste properly.

It should be more affordable to recycle and compost than to throw materials away to further incentivize consumers to reduce the amount of garbage they produce. In many communities, garbage is collected for free or at a flat "all you can throw" rate, giving consumers no incentive to reduce the amount of waste they produce and throw away. PAYT programs incentivize consumers to waste less and to recycle and compost more. These programs should be implemented everywhere and fees should be sufficient to incentivize composting and recycling.

There are other policies that can incentivize recycling and composting. Bottle bills, for instance, tack a small deposit onto products that come in bottles or cans. If consumers return the bottles and cans to be reused and recycled, they receive the deposit back, providing a direct incentive to return the bottles and cans instead of throwing them away. A 2002 study found that bottle and can recycling rates are more than twice as high in states with bottle bills.[119] Also, the recyclable material collected as a result of bottle bills is of higher quality because it is separated and does not get contaminated by other materials, thereby commanding higher value in the marketplace. This is especially true for glass, which is easily contaminated in single-stream recycling collection. Deposit laws, such as bottle bills, should be extended to other items as well.

3. Encourage goods to be built to last and easy to repair, reuse, recycle or compost.

To move toward zero waste, policy-makers should encourage the production and sale of products that are built to last and easy to repair, reuse, recycle or compost.

When products do break, it should be easy and cost-effective to repair them rather than throw them out. Many products are intentionally or inadvertently made to be difficult or impossible to repair, so they must be replaced when they break. It is also often cheaper to buy new products than to repair existing ones. Policies that require the manufacturers of certain products to warranty their goods for a substantial length of time could encourage the sale of higher-quality

products that are less likely to be thrown away prematurely.

In addition, some manufacturers hold the rights to all of the tools, parts or software needed to fix their products – a situation that can make it difficult or prohibitively expensive for consumers to have products repaired. Policymakers should enact "Right to Repair" reforms to remove these barriers. These reforms require that information, parts and tools needed to repair products be made available to consumers. These reforms also expand consumers' rights to adapt and modify products to extend their useful lives.

Electronics are becoming a notorious example of products that break quickly and are difficult to repair. This is problematic because electronics can leach toxins into the environment when they are disposed of and they often incorporate plastics and rare minerals and metals that require intensive extraction processes. The U.S. EPEAT registry ranks electronics based on how environmentally-friendly they are and consumers, businesses and institutions such as government agencies use these rankings to inform their purchasing decisions. A recent study shows that manufacturers largely control the processes of setting the standards for these rankings, though.[120] This has caused the standards to be too low to spur the development of more sustainable products. For example, manufacturers have blocked attempts to award points to products that are easier to repair, modify or recycle.[121] The U.S. should strengthen the standards used in awarding its EPEAT rankings to encourage the development of longer-lasting electronics that are easier to repair and recycle.

Many products, such as lightweight and flexible packaging, are difficult to recycle. Some products are difficult to recycle because they combine materials. Children's flexible juice packs, for instance, usually combine metal and plastic that are too difficult for recycling facilities to separate. To avoid this, lawmakers should set standards for products sold in the U.S. to be recyclable or compostable. The U.S. should also support research into new materials that are more recyclable or compostable, or less polluting, as well as new recycling applications for discarded materials.

4. Ban the sale of single-use items that are not easily recyclable or compostable, including packaging, plastic bags and food service ware.

Packaging makes up almost one-third of the materials thrown out by homes and businesses in the U.S.[122] Producers should be required to limit the amount of packaging they use and to make all packaging easy to recycle or compost.

Policymakers should tax, limit or ban products with limited usefulness that will most likely end up as waste. Single-use plastic bags, for example, almost all end up as waste and many as litter in our communities and waterways. These items are used for mere moments and then take decades to centuries to break down, harming the environment and our health in the process. To stop this nonsensical cycle, the states of California and Hawaii and many U.S. cities have banned single-use plastic shopping bags. Many other cities, counties and states in the U.S. have programs to limit plastic bags or increase their recycling rates.[123]

Many communities are also banning the sale of polystyrene, commonly referred to as "Styrofoam," a particular brand name. These communities are banning polystyrene, or specific polystyrene products like take-out food containers and packing peanuts, because they are typically not recyclable, do not biodegrade and create harmful litter. In Massachusetts alone, at least 26 towns and cities have banned polystyrene.[124]

The use of disposable food service ware – straws, coffee cups, plastic forks, to-go containers, napkins, paper towels, paper plates, solo cups, etc. – should be limited and all products should be easily recyclable or compostable.

A bulldozer at the Buckhead Mesa Landfill in Arizona. About 30 percent of all U.S. garbage is packaging. If the use of packaging were limited and if all packaging was easily reusable, recyclable or compostable, a significant amount of U.S. waste would be eliminated. Photo credit: Alan Levine via Flickr, CC BY 2.0.

5. Require producers to take more responsibility for their products during their entire life cycle.

Producers are usually not responsible for their products once they are purchased or their warranty runs out, so they do not have to pay to dispose of those products at the end of their useful lives. Producers, therefore, have no financial incentives to use less packaging, to build products to last, or to make their products or packaging easy to repair, reuse, recycle, or compost.

Producers should be required to collect hard-to-recycle products after their useful lives. This will encourage producers to change the design of their products to be easily reusable, repairable, recyclable or compostable and will increase the recycling rates of difficult-to-recycle products. Several states have paint product stewardship laws, which require paint manufacturers to create programs individually or collectively that make it easy for consumers to drop off their leftover paint.[125] The manufacturers then must find opportunities for the paint to be reused or must dispose of it in an environmentally sound way.[126]

Producers should be required to pay for the collection of their products that are already picked up by municipal services, like certain plastics and paper products. This will encourage producers to use less packaging and to build long-lasting products that are easy to reuse and repair, so that less is ultimately thrown out. Some Canadian provinces have adopted programs like this, in which waste collection and disposal are still provided as a public service, but are paid for by producers rather than taxpayers.[127] Because the cost of recycling is higher for hard-to-recycle items, this also incentivizes producers to design containers that are easy to recycle.

6. Ensure that repair, reuse, recycling and composting facilities exist to handle the materials stream.

During the 20th century, the U.S. became ingrained in the practice of disposing of materials as waste. This has led to vast public and private investments in infrastructure to bury and burn waste. The practice of disposing of everything as waste – and the landfills and incinerators that facilitate the practice – need to be seen as outdated and dangerous, and retired. To create a new system, in which all materials are conserved and reused indefinitely, the U.S. needs to commit to new infrastructure – diversion, sorting, recycling and composting facilities.

Programs that guarantee a consistent, high quality stream of materials for reuse, recycling or composting facilities encourage the development of this type of infrastructure. For example, glass recyclers will likely build facilities in states with bottle bills because they are guaranteed an ongoing supply of quality, recyclable glass. Likewise, companies will likely build anaerobic digesters in states that require large institutions to divert organic materials to composting facilities.

Increased recycling and composting rates may not be enough to stimulate the construction of recycling and composting infrastructure initially, so the public sector may need to invest strategically in these facilities to aid in the transition to a zero-waste economy.

7. Encourage producers to use recycled and reused materials in new products.

Encouraging or requiring that new products be made using reused or recycled material helps create a market for those materials, which increases the cost-effectiveness of recycling collection and processing. One way to achieve this is to revise procurement policies at large and/or for public institutions like government agencies and universities. Procurement policies can require institutions to purchase products made with a certain amount of recycled materials. For example, most state agencies are required to purchase copy paper containing recycled content, but most of these requirements could be significantly increased and extended to other products.[128] Institutional policies can also require that a certain amount of reused material be used in construction, like using old ceiling tiles to make asphalt.

Federal, state, and local policies can also require that new products manufactured or sold in their jurisdictions be made using reused or recycled material. Wisconsin, for instance, requires that all plastic containers sold in the state be made with a certain percentage of recycled content.[129]

8. Price goods to reflect the environmental and public health impacts of their production.

The price of goods often does not reflect the impact of their production on the environment or public health. This has led to the proliferation of cheap goods that have serious environmental and public health impacts that society must ultimately pay for.

If products were priced to reflect the environmental and public health impacts of their production, such as the social costs of greenhouse gas emissions or other forms of pollution, consumers would make more thoughtful purchases, which would reduce the amount of materials needlessly thrown out. This would also encourage the development of safer and more environmentally-friendly products and would lower the societal costs of environmental and public health impacts.

9. As waste is eliminated, ensure that all remaining waste is disposed of safely.

It will take time to move toward a circular economy that produces zero waste. During that time, all discarded materials need to be disposed of safely.

To protect the environment and public health, goods that are hazardous during their production, use or disposal should be banned. Mercury, for example, which is toxic to humans, was common in batteries and thermostats until it was largely phased out by legislative bans. There are substances that are still used in products that should also be banned in the U.S. For instance, the U.S. is one of the only industrialized nations that has not completely banned asbestos, which can cause lung cancer, mesothelioma and other chronic respiratory ailments.[130]

U.S. chemical policy should be revised to reduce and ultimately eliminate the presence of toxics in household products. New substances are put out on the market so quickly, that safety precautions tend to lag behind. To address this, the European Union enacted a regulation called REACH, which requires industries to study the risks associated with substances they use and to register that information in a central database, so that safety information is readily available.[131] This regulation also requires the most toxic substances to be phased out and replaced with safer alternatives.[132] The U.S. should enact similar regulations.

Policies can also be enacted to increase the reuse and recycling of hazardous materials. A federal act passed in 1996, for example, required manufacturers to make batteries easier to recycle to prevent them from being dumped into landfills where they can leach hazardous chemicals into the environment.[133] Policies such as this should be enacted for all hazardous materials.

The U.S. also needs to invest in improving overall hazardous waste management, which is regulated under the Resource Conservation and Recovery Act. The American Society of Civil Engineers gave U.S. hazardous waste infrastructure a D+ in 2017 and said that support is needed to develop new methods in manufacturing and hazardous waste management.[134]

10. Oppose the construction, expansion and subsidization of landfills and incinerators.

To encourage the necessary transition to a zero-waste economy and to protect the environment and public health, local and state governments should oppose new or expanded landfills and incinerators.

The incineration industry markets "waste-to-energy" incinerators as renewable energy resources and solutions for America's waste problem. Burning garbage, however, necessitates that new materials be extracted, a process that creates immense amounts of waste and pollution itself. Producing new materials also consumes far more energy than reuse and recycling.[135]

"Waste-to-energy" facilities also claim to incinerate trash safely and to produce less pollution with new technologies, but all are variations on combustion, gasification and pyrolysis, which cause very similar problems.[136] Incineration facilities are also promoted as being superior to landfills, but the ash they produce ultimately ends up in landfills. Furthermore, incinerator ash is toxic and may leach into water supplies when it is dumped in toxic waste landfills.[137]

Incinerators are also often uneconomical. It is far cheaper to dig a hole and landfill waste than it is to build a power plant and run it to burn garbage. As a result, incinerators are often built using public subsidy. The city of Harrisburg, Pennsylvania, for example, filed for bankruptcy in 2011 largely due to a bad incinerator deal.[138]

Because incinerators are so expensive, they need to generate a steady volume of electricity to sell to the grid and need to collect the fees that waste haulers pay to dump their loads there for a long enough time to repay investors. Because of this, incinerators have municipalities sign long-term contracts committing to provide a steady volume of waste, often for 20 to 30 years.[139] If the towns do not provide as much waste as their contract requires, they can be penalized by the incinerator operator. A town in Connecticut was charged $47,000 for not delivering as much waste to an incinerator as its contract required.[140] This need for a continual, consistent waste stream is at odds with efforts to reduce waste. Incinerators also need waste that produces the most energy by weight and volume to be economical. Plastics tend to be best because they are made out of petroleum, so this creates another disincentive for recycling.[141]

Incineration is not a solution to the U.S. waste problem, it is just another form of the same system. These projects should be actively opposed, not encouraged and subsidized.

Towns and cities, states and the U.S. as a whole should adopt these recommendations and follow the leadership of the communities shifting to a circular economy. We have the technology and know-how to make this transformation – to conserve natural resources and energy, to cut pollution and to protect our health, environment and future. Now is the time to commit to making a zero waste America reality.

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