Testimony to Subcommittee on Climate and Environment
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Introduction

The United States is facing both a climate crisis and a waste crisis. Given that the production and disposal of waste, particularly plastic waste, is a large and growing contributor to the worsening climate crisis, we cannot prevent catastrophic climate change without also addressing the crisis of waste. When measured alone, the processing, breakdown, and burning of waste contributes significantly to climate emissions. In 2018, waste incineration and landfilling made up 98.2% of greenhouse gas emissions (GHG) from waste, making waste the 6th greatest source of GHG emissions in the U.S. after petrochemical-related activities.[1] Waste-to-energy incinerators - which are often touted as a "greener" waste solution - emit more greenhouse gases than coal-fired power plants, per unit of energy generated. That figure increases when more plastic is burned. Moreover, the disposal of waste has polluted our air, land, and water, harmed health, and lowered the standard of living for our communities. Waste is a byproduct of a system designed for overproduction and overconsumption. Therefore, the upstream solutions are just as important as the downstream solutions, perhaps more so. Emissions from waste cannot exist if we do not produce the waste in the first place.

Emissions from Waste

Greenhouse gas emissions and waste production have increased over the past two decades at a time when both need to reach net zero. From 1960-2015, the total U.S. waste stream increased from 88 million tons to 267.8 million tons, nearly doubling the quantity produced per person from 2.68 lbs/person/day to 4.51 lbs/person/day.[2] Over the past 30 years, the amount of food and plastic waste have each nearly doubled while textile waste has tripled.[3] According to the EPA's latest data, only 25% of all municipal solid waste was recycled and only 10% composted.[4] Of the remaining municipal solid waste (MSW), 12.7% or 34 million tons was incinerated and the remaining 52.1%

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[1] "Greenhouse Gas Reporting Program: GHGRP Waste." *United States Environmental Protection Agency*, www.epa.gov/ghgreporting/ghgrp-waste. Accessed 2 March 2020.
[2] "National Overview: Facts and Figures on Materials, Wastes and Recycling." *United States Environmental Protection Agency*, 2019, www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/national-overview-facts-and-figures-materials#NationalPicture. Accessed 2 March 2020.
[3] Ibid.
[4] "Advancing Sustainable Materials Management: 2017 Fact Sheet." *United States Environmental Protection Agency*, 2019, www.epa.gov/sites/production/files/2019-11/documents/2017_facts_and_figures_fact_sheet_final.pdf. Accessed 2 March 2020.

or 139 million tons of household waste was landfilled.[5] While the majority of waste-related GHG emissions came from landfills, incineration accounted for 8.8% of total waste-related GHG emissions.

Decomposing organic waste in landfills is the second-largest contributor to human-related emissions of methane, a greenhouse gas that traps 84 times more heat than carbon dioxide over a 20-year period.[6] Food waste comprises the largest share of landfilled materials at 22%; other organic materials such as yard trimmings and wood comprise another 15%, meaning that over one third of all landfilled materials in the United States could be diverted to compost.[7] While landfill gas capture systems can be useful in mitigating the climate impacts from landfilling, estimates for methane leakage vary significantly,[8] with higher rates of capture in closed landfills.[9] Furthermore, subsidies for systems to convert landfill gas to energy systems potentially discourage separate collection, especially of yard waste and food waste.

Environmental Justice

Incinerators and landfills are most often sited near environmental justice communities or primarily low-income communities and communities of color.[10] In fact, 79% of MSW incinerators are located in environmental justice communities.[11] Along with GHG emissions, MSW incinerators emit co-pollutants that are harmful to human health at greater rates than fossil fuel power plants, including particulate matter, dioxins, lead, and mercury. Ten of the twelve incinerators in the US that produce the greatest amount of lead emissions are in environmental justice communities that are already heavily burdened with pollution.[12] The ash produced from incineration must then be landfilled

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[5] "National Overview: Facts and Figures on Materials, Wastes and Recycling." *United States Environmental Protection Agency*, 2019, www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/national-overview-facts-and-figures-materials#NationalPicture. Accessed 2 March 2020.

[6] "Understanding Global Warming Potentials." *United States Environmental Protection Agency*, www.epa.gov/ghgemissions/understanding-global-warming-potentials. Accessed 2 March 2020.

[7] "Advancing Sustainable Materials Management: 2017 Fact Sheet." *United States Environmental Protection Agency*, 2019, www.epa.gov/sites/production/files/2019-11/documents/2017_facts_and_figures_fact_sheet_final.pdf. Accessed 2 March 2020.

[8] Oonk, Hans. "Efficiency of landfill gas collection for methane emission reduction", *Greenhouse Gas Measurement and Management*, vol. 2, no. 2-3, 2012, pp. 129-145, www.tandfonline.com/doi/full/10.1080/20430779.2012.730798?scroll=top&needAccess=true. Accessed 2 March 2020.

[9] Powell, Jon, Timothy Townsend & Julie Zimmerman. "Estimates of solid waste disposal rates and reduction targets for landfill gas emissions." Nature Climate Change, vol. 6, 2016, pp. 162–165, www.nature.com/articles/nclimate2804. Accessed 2 March 2020.

[10] Bullard, Robert D., Ph.D., Mohai, Paul, Ph.D., Saha, Robin, Ph.D., Wright, Beverly Ph.D. *Toxic Wastes and Race at Twenty 1987-2007.* United Church of Christ, 2007, www.nrdc.org/sites/default/files/toxic-wastes-and-race-at-twenty-1987-2007.pdf. Accessed 2 March 2020.

[11] Based on census tracts where: (a) the percentage of people living below the federal poverty rate is above 25% OR (b) the percentage of people identify as "minority" is above 25 percent. Baptista, Ana and Adrienne Perovich. "U.S. Municipal Solid Waste Incinerators: An Industry in Decline." *The New School: Tishman Environment and Design Center,* May 2019, www.no-burn.org/industryindecline. Accessed 2 March 2020.

[12] Ibid.

adding to the environmental burden of those communities and risking exposure through air and water contamination.[13] These same communities are also the hardest hit by the impacts of climate change whether it is from severe storms and hurricanes, deadly heat waves, wildfires, rising sea level, spikes in food prices, or pollution, allergy, and pollen-induced asthma attacks, and less resilient to these impacts.[14]

The production and disposal of plastics exacerbate both the burden of pollution and that of the climate crisis for every community, and environmental justice communities, in particular.

The Plastic Crisis

Plastic is a pervasive pollutant. Plastic and plastic additives have reached the most remote parts of the Earth and are now found on our beaches, in our soil, in our drinking water, in our food supply, and in our bodies. Moreover, both plastic production and incineration of plastic waste are large contributors of greenhouse gases. Only 9.1% of all plastic produced since 1950 has ever been recycled and 15.5% has been incinerated. As of 2019, the production and incineration of plastic was accountable for more than 850 million metric tons of greenhouse gases to the atmosphere—equal to the emissions from 189 five-hundred-megawatt coal power plants.[15] If growth in plastic production and incineration continues as planned by industry, cumulative greenhouse gas emissions by 2050 will be over 56 gigatons CO2e, or between 10-13 percent of the total remaining global carbon budget to keep global temperature rise below 1.5C.[16] The EPA designates incineration as the worst approach to end-of-life plastic waste management because of its adverse climate impacts.[17]

Despite the significant impact of plastic production, consumption, and disposal to climate, environment, and human health, plastic production and waste has been increasing at an alarming rate. From the period of 1960-2015, plastics in the waste stream grew from 0 to 13.1%, but the steepest climb in plastic waste has occurred in the last 15 years.[18] Yet, faced with an accelerating plastic crisis, fossil fuel and plastics companies plan to expand production. By 2023, the

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[13] Baptista, Ana and Adrienne Perovich. "U.S. Municipal Solid Waste Incinerators: An Industry in Decline." *The New School: Tishman Environment and Design Center*, May 2019, https://www.no-burn.org/industryindecline. Accessed 2 March 2020.

[14] Balbus, John. "Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment. Chapter 14 - Human Health." *U.S. Global Change Research Program*, 2018, nca2018.globalchange.gov/downloads/NCA4_Ch14_Human-Health_Full.pdf. Accessed 2 March 2020.

[15] "Plastic and Climate: The Hidden Costs of a Plastic Planet." Center for International Environmental Law, 2019, www.ciel.org/plasticandclimate. Accessed 2 March 2020. *This report only examined incineration of plastic packaging due to a lack of available data on other types of plastic. Emissions from burning all types of plastic would therefore be much higher.*

[16] Ibidem

[17] "Solid Waste Management and Greenhouse Gases A Life-Cycle Assessment of Emissions and Sinks." *United States Environmental Protection Agency*, Sep 2006, nepis.epa.gov/Exe/ZyPDF.cgi/60000AVO.PDF?Dockey=60000AVO.PDF. Accessed 2 March 2020.

[18] "Greenhouse Gas Reporting Program: GHGRP Waste." United States Environmental Protection Agency, www.epa.gov/ghgreporting/ghgrp-waste. Accessed 2 March 2020.

petrochemical industry plans to build 264 new plastics-related facilities in the U.S.[19] By 2050, fossil fuel companies estimate that the total volume of plastic ever produced will reach 34 billion — over four times what has been produced so far. In short, the petrochemical industry plans to quadruple plastics production in the next several decades.[20]

Even without this increase, our current system of managing plastic waste is failing. Plastic recycling rates, never more than 12%, are now estimated to be as low as 4.4% and recycled plastic simply cannot compete with the lower cost of new plastic made from subsidized natural gas.[21] China's National Sword policy and the recent closure of Asian markets for plastic waste has forced the United States to deal with an unprecedented amount of plastic waste. The combination of cheap, new plastic and lack of end markets for recycling has led to more plastic waste going to landfill and incineration in the U.S., further perpetuating our waste and climate crises.

False Solutions to the Crises

False solutions to the dual crises of waste and climate worsen these problems by contributing to climate change while costing local governments and taxpayers money and undermining real and transformative solutions. Some of the most popular false solutions include incineration, and chemical recycling.

Incineration

Incinerators - which are often touted as a "greener" waste solution - emit more greenhouse gases than coal-fired power plants, per unit of energy generated.[22] Every metric ton of plastic burned in an incinerator results in about 2.7 tons of CO2 emissions, as incineration immediately releases all carbon embedded in plastic to the air[23] As such, incineration should never be classified as a renewable energy source, not only because it produces greenhouse gases, but also because it requires burning a steady supply of non-renewable materials.[24] Moreover, the application of

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[19] Scott, Jennifer. "U.S. Chemical Industry Investment Linked to Shale Gas Tops $164 Billion." Press release, American Chemistry Council, 6 April 2016. www.americanchemistry.com/Media/PressReleasesTranscripts/ACC-news-releases/US-Chemical-Industry-Investment-Linked-to-Shale-Gas-Tops-164-Billion.html. Accessed 2 March 2020.

[20] "Plastic and Climate: The Hidden Costs of a Plastic Planet." Center for International Environmental Law, 2019, www.ciel.org/plasticandclimate. Accessed 2 March 2020.

[21] Dell, Jan. "U.S. Plastic Recycling Rate Projected to Drop to 4.4% in 2018." Plastic Pollution Coalition, 4 Oct. 2018, www.plasticpollutioncoalition.org/blog/2018/10/4/us-plastic-recycling-rate-projected-to-drop-to-44-in-2018?rq=recycling%20rates. Accessed 2 March 2020.

[22] Baptista, Ana and Adrienne Perovich. "U.S. Municipal Solid Waste Incinerators: An Industry in Decline." *The New School: Tishman Environment and Design Center,* May 2019, www.no-burn.org/industryindecline. Accessed 2 March 2020.

[23] "The Circular Economy – A Powerful Force for Climate Mitigation. Transformative innovation for prosperous and low-carbon industry." *Material Economics*, 2018, materialeconomics.com/publications/the-circular-economy-a-powerful-force-for-climate-mitigation-1. Accessed 2 March 2020.

[24] Platt, Brenda et al, "Stop Trashing the Climate." *Institute for Local Self-Reliance, Eco-Cycle, Global Alliance for Incinerator Alternatives*, 2008, ilsr.org/wp-content/uploads/2008/06/fullreport_stoptrashingtheclimate.pdf. Accessed 2 March 2020.

renewable energy subsidies towards incineration facilities diverts funding away from *real* renewable projects.

Incineration is also comparatively more expensive, and contributes very little to the energy grid overall, adding only 0.4% in 2015. Adding to the cost for governments, incinerators compete against landfills for tipping fees - the dollars paid per ton of waste that this delivered to a landfill or incinerator - from municipalities, counties, and businesses, their largest source of revenue. For example, Covanta Corporation collects 71% of revenue from tipping fees and 18% from electricity sales.[25]

In addition, the majority of MSW incinerators, at an average age of 30, are reaching end-of-life and need significant upgrades. Contracts with incinerators in need of capital investments can leave local governments and taxpayers with the costly burden of subsidizing upgrades at a time when local governments face financial challenges for waste collection and recycling operations. Over the last 20 years, 31 MSW incinerators have closed, primarily because of their inability to afford upgrades necessary to meet health protective emissions standards.[26] New incinerators also cost more to build and maintain than other forms of waste disposal. High capital and operating costs are a major reason why only one incinerator has been built in the U.S. since 1997 and why a proposal for a $400 million incinerator in Frederick, Maryland, was canceled.[27]

In many cases, incinerators require governments to produce waste to burn through "put or pay" contracts. This arrangement can obligate governments and taxpayers into a system that requires constantly feeding incinerators and could open them up to penalties and litigation where investments could be made in efforts to reduce waste, recycle, and compost. For example, in 2019, incineration company Wheelabrator sued Baltimore County for $32 million after the county delivered 30% less waste to the Baltimore incinerator than was required through a 2011 contract agreement.[28] Indianapolis paid Covanta half a million dollars per year in penalties for sending less waste to the local incinerator[29] after failing to meet a contract waste quota that led to Indianapolis being named "one of the most wasteful big cities in America".[30]

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[25] "2018 Annual Report." *Covanta.* 2019, www.annualreports.com/HostedData/AnnualReports/PDF/NYSE_CVA_2018.pdf. Accessed 2 March 2020.
[26] Baptista, Ana and Adrienne Perovich. "U.S. Municipal Solid Waste Incinerators: An Industry in Decline." *The New School: Tishman Environment and Design Center,* May 2019, www.no-burn.org/industryindecline. Accessed 2 March 2020.
[27] Jones, Paige. "County scraps plans for waste-to-energy incinerator." The Frederick News-Post, 21 Nov. 2014, www.fredericknewspost.com/news/politics_and_government/county-scraps-plans-for-waste-to-energy-incinerator/article_dff14b7f-a29f-5bcf-a726-9245a1fe8df6.html. Accessed 2 March 2020.
[28] Li, Rina. "Wheelabrator sues Baltimore County over $32M contract dispute." Waste Dive, 16 Apr. 2019, www.wastedive.com/news/wheelabrator-baltimore-lawsuit-contract-dispute/552762/. Accessed 2 March 2020.
[29] Lovely, Lori. "A Dirty MRF for Indy?." MSW Management, 26 Mar. 2015, www.mswmanagement.com/collection/article/13015918/a-dirty-mrf-for-indy. Accessed 2 March 2020.
[30] Bowman, Sarah and Emily Hopkins. "How Indianapolis became one of the most wasteful big cities in America." Indy Star, Jan. 20 2019, www.indystar.com/story/news/environment/2019/01/30/indianapolis-biggest-city-u-s-without-recycling-all/1272400002. Accessed 2 March 2020.

Chemical Recycling

While the world contends with the plastic crisis, the petrochemical industry has proposed refashioning old technologies such as pyrolysis and gasification to convert plastics to fuel under the guise of "chemical recycling". The few facilities that have been built remain in the pilot stage and seem unlikely to address the root causes of plastic pollution while raising concerns about increased climate emissions and toxic waste when compared with plastic reduction and mechanical recycling. The little information that is known about these technologies reveals that it is either energy intensive and produces large quantities of toxic air emissions, liquid effluent, and solid waste, in part because of toxic additives within waste plastic. Once burned, these products cannot be converted back into plastics, and are therefore, not recycling. Plastic-derived fuels also increasingly threaten to displace renewable energy rather than other fossil fuels and undermines our efforts to wean ourselves from fossil fuels.

Where plastics are necessary, they should be designed for safe and easy recycling, without toxic additives. To the extent that chemical recycling may have a role in addressing historical, specialized, or contaminated plastic waste streams, it must not be incentivized to compete with mechanical recycling or other measures higher in the waste hierarchy.

Recommendations:

The recent attention to plastic pollution shines a light on the systemic problems of how waste is created and managed in the United States. In the present system, it is difficult for consumers to avoid plastic. Local governments are tasked with collecting recyclable material but face diminishing markets to sell it. Meanwhile, consumer goods companies and retailers continue to sell products in non-recyclable, single use packages made from cheap, virgin plastic. This system of overproduction and overconsumption will continue to fuel the waste and climate crisis until upstream and downstream solutions are systematically designed to mitigate them.

We recommend the following actions be taken:

1) Ban incineration and minimize landfilling to the greatest extent possible. These waste management practices contribute to the climate crisis and disproportionately impact environmental justice communities. As these facilities close, communities impacted by their pollution should determine how the land will be used in the future either through direct ownership or consultation. Waste-to-energy incineration should never be classified as a renewable energy source, not only because it produces greenhouse gases, but also because it requires burning a steady supply of non-renewable materials.[31] Moreover, the application of renewable energy subsidies towards incineration facilities diverts funding away from *real* renewable projects.

[31] Platt, Brenda et al, "Stop Trashing the Climate." *Institute for Local Self-Reliance, Eco-Cycle, Global Alliance for Incinerator Alternatives*, 2008, ilsr.org/wp-content/uploads/2008/06/fullreport_stoptrashingtheclimate.pdf. Accessed 2 March 2020.

2) Ban the production of single use plastics and plastics that cannot be mechanically recycled and enact a national container deposit program to promote recycling markets. If at the end of a material's life, it cannot be mechanically recycled or composted, and there are no sustainable, reliable, affordable, and safe means of disposing of them - currently there is not - it should not be produced in the first place.
3) Reduce plastic production and level the playing field for upstream and downstream solutions, including halting permits for new and expanding plastic production facilities and ending subsidies for fossil fuel extraction. Any new proposals must require free, prior, and informed consent of indigenous and local communities. Subsidies for oil and gas extraction have led to a glut in virgin plastic from oil and gas that make plastic recycling uncompetitive while flooding the marketplace with more plastic.
4) Incentivize innovation in new local reuse and refill businesses and systems across the country. In environmental justice communities, grants, lending, and incentives should prioritized for low-income and minority communities that have been historically harmed by pollution and disinvestment to build businesses. Focusing on recycling presents a narrow view of the potential to develop a circular economy[32] for zero waste, and history has already shown that recycling alone will not solve the plastic crisis. A true reformation of the waste management system should encourage repair and reuse as well as recycling and composting and should disincentivize the creation of waste that cannot be reused, recycled, or composted.
5) Mandate manufacturers use high levels of recycled content in new products and packaging. All waste should be managed using the waste hierarchy. Where plastics are necessary, they should be designed for safe and easy recycling, without toxic additives. To the extent that chemical recycling may have a role in addressing historical, specialized, or contaminated plastic waste streams, it must not be incentivized to compete with mechanical recycling or other measures higher in the waste hierarchy.
6) Enact waste management policies and investments that prioritize the diversion of organic waste to compost and prevent food waste, to minimize methane from landfills. According to the Tellus Institute, on a per-ton basis, composting sustains at least four times the number of jobs as landfill or incinerator disposal.[33] The expanded use of compost will increase carbon sequestration, produce more nutritious foods, reduce water use, avoid landfill methane and waste incinerator emissions, reduce chemical pesticide and fertilizer reliance, and help prevent nutrient run-off and soil erosion. Markets for quality compost are growing thanks to the expansion of sustainable practices that also mitigate climate impacts such as storm water management, green roofs, rain gardens, erosion and sediment control, and other development.

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[32] The European Commission developed a Circular Economy Action Plan, which sets out to "close the loop of product lifecycles. It puts a major emphasis on finding new, innovative means to move away from a 'take-make-dispose' culture, for instance by recycling and re-using products for longer." ec.europa.eu/commission/priorities/jobs-growth-and-investment/towards-circular-economy_en. Accessed 2 March 2020.

[33] Goldstein, James and Christi Electis. "More Jobs, Less Pollution: Growing the Recycling Economy in the U.S." Tellus Institute with Sound Resource Management, 2011, www.no-burn.org/more-jobs-less-pollution. Accessed 2 March 2020.