COMMITTEE ON
ENERGY & COMMERCE
CHAIRMAN FRANK PALLONE, JR.

MEMORANDUM

March 2, 2020

To: Subcommittee on Environment and Climate Change Members and Staff

Fr: Committee on Energy and Commerce Staff

Re: Hearing on "Reduce, Reuse, Recycle, Reform: Addressing America's Plastic Waste Crisis"

On **Wednesday, March 4, 2020, at 10:30 a.m. in room 2322 of the Rayburn House Office Building**, the Subcommittee on Environment and Climate Change will hold a hearing entitled, "Reduce, Reuse, Recycle, Reform: Addressing America's Plastic Waste Crisis." The hearing will focus on issues related to recycling and waste management in the United States, including impacts on climate and the environment.

I. BACKGROUND

The Environmental Protection Agency (EPA) regulates household, industrial, and manufacturing wastes under the Resource Conservation and Recovery Act (RCRA) of 1976. RCRA amended and substantially expanded the Solid Waste Disposal Act of 1965.[1] RCRA aims to reduce waste and protect the public from waste disposal hazards through various measures. These measures include defining solid and hazardous waste; authorizing EPA to set standards for facilities that generate or manage hazardous waste; establishing a permit program for hazardous waste treatment, storage, and disposal facilities; and authorizing EPA to set criteria for disposal facilities that accept municipal solid waste.[2]

Hazardous waste is managed at the federal level under Subtitle C of RCRA, while the management of non-hazardous solid waste is primarily delegated to the states.[3] Subtitle D of RCRA provides state and local governments with authority to regulate non-hazardous waste, including management of recycling programs.[4] This hearing will focus on non-hazardous waste management.

---

[1] Pub. L. No. 89-272 (1965) and Pub. L. No. 94-580 (1976).

[2] Congressional Research Service, *Environmental Laws: Summaries of Major Statutes Administered by the Environmental Protection Agency* (Dec. 20, 2013) (RL30798).

[3] For additional information on waste regulation, including the definitions of hazardous and non-hazardous solid waste, see note 2 at 52.

[4] *See* note 2.

II. CLIMATE IMPACTS OF PLASTICS AND RECYCLING

EPA estimates that recycling, composting, and incineration with energy recovery (also known as waste-to-energy) collectively reduced U.S. greenhouse gas (GHG) emissions by nearly 185 million metric tons of carbon dioxide equivalent ($MMTCO_2e$) in 2017.[5]

The climate impacts of waste disposal depend on whether waste is recycled, incinerated (with or without energy recovery), landfilled, or composted. According to the Center for International Environmental Law (CIEL), recycling has the greatest emissions reduction potential among plastic waste disposal options (resulting in net negative emissions).[6] Landfills and incineration, in contrast, produce net positive emissions. Decomposition of waste in landfills produces methane, a potential GHG, while incineration produces carbon dioxide as a byproduct.

Although recycling has the potential to reduce emissions from plastic waste disposal, practical challenges – including sorting and contamination[7] – limit the amount of plastic that is ultimately recycled. Research suggests that just nine percent of all plastic waste ever produced has been recycled; another 79 percent ended up in landfills or as litter, while 12 percent was incinerated.[8] In the United States, plastic waste disposal resulted in a net GHG emissions increase in 2017.[9]

CIEL estimates that lifecycle emissions[10] from plastics exceeded 850 $MMTCO_2e$ in 2019, equivalent to the GHG emissions from 189 coal-fired power plants. By 2050, CIEL projects lifecycle emissions from plastics to exceed 2,800 $MMTCO_2e$, accounting for as much as 13 percent of the global carbon budget through that year.[11] Increased demand for petrochemicals, which are used as a feedstock to produce plastics, will drive emissions growth. Petrochemicals currently account for 12 percent of global oil demand, but that figure is expected to increase to 50 percent by 2050 as demand for plastics rises.[12] A recent study identified 88

[5] U.S. EPA, *Advancing Sustainable Materials Management: 2017 Fact Sheet* (Nov. 2019).

[6] Center for International Environmental Law, *Plastic & Climate: The Hidden Costs of a Plastic Planet* (May 2019).

[7] "Contamination" occurs when non-recyclable waste is mixed with recyclable materials, rendering the entire waste stream unusable.

[8] Roland Geyer, et al., *Production, use, and fate of all plastics ever made*, Science Advances (Jun. 19, 2017).

[9] *See* note 5 at 13.

[10] Lifecycle emissions include fossil fuel extraction and transport; refining and manufacture; disposal; and degradation in the environment. *See* note 6.

[11] *See* note 6 at 1 and 2.

[12] International Energy Agency, *The Future of Petrochemicals* (iea.org/reports/the-future-of-petrochemicals) (Oct. 2018).

petrochemical projects either in planning or under construction in the United States, which, if completed, will emit the equivalent GHG emissions of 38 coal-fired power plants each year.[13]

The environmental impacts of waste management are not limited to climate change. Incineration, for instance, can release toxic pollutants into the air, while landfills pose risks to both local air quality and water resources. Incinerators and landfills are disproportionately built near communities of color and low-income populations.[14]

III. RECYCLING AND WASTE MANAGEMENT IN THE UNITED STATES

The United States generated 268 million tons of municipal solid waste[15] (MSW) in 2017, just over half of which went to landfills.[16] Another 25 percent were recycled, 12.7 percent were incinerated with energy recovery, and about ten percent were composted. Combined recycling and composting rates have gradually increased over time, from 6.4 percent of all MSW generated in 1960 to 35.2 percent in 2017. Despite this trend, recycling rates vary widely across materials. For instance, two-thirds of all paper and paperboard generated were recycled in 2017, while just over eight percent of plastics were recycled.[17]

Furthermore, much of the waste that is disposed of via recycling ultimately ends up in landfills, incinerated, or "downcycled."[18] By one estimate, only two percent of global plastics are recycled into new products with the same functionality; another eight percent are downcycled and the rest is landfilled, incinerated, or left as litter in the environment.[19]

A. <u>Global Challenges</u>

Recycling in the United States has undergone significant changes in recent years, largely driven by policy changes abroad. For decades, China imported most of the world's recycled waste material. The low cost of labor, growing demand for raw materials to produce consumer goods, and relatively lax waste processing standards made China a reliable market for exporting

---

[13] Andrew R. Waxman, et al., *Emissions in the stream: estimating the greenhouse gas impacts of an oil and gas boom*, Environmental Research Letters (Jan. 14, 2020).

[14] *See* note 6.

[15] MSW includes everyday items collected as trash, such as product packaging, bottles and cans, yard trimmings, furniture, clothing, food, newspapers, appliances, and electronics.

[16] *See* note 5.

[17] *Id.*

[18] "Downcycling" is the process of converting waste into new materials of lower quality, lower value, or reduced functionality. Products that use downcycled materials typically end up in landfills when they are disposed. *See, e.g.,* note 19.

[19] Yale University, *How plastics contribute to climate change* (yaleclimateconnections.org/ 2019/08/ how-plastics-contribute-to-climate-change) (Aug. 20, 2019).

recovered waste. Since 1992, China has imported 45 percent of the world's plastic waste.[20] In 2016 alone, it imported two-thirds of global plastic waste.[21]

In 2017, in response to growing environmental concerns and high waste contamination rates, China announced new restrictions on imported waste. In January 2018, China officially banned most waste imports and set new contamination limits on the materials it would accept.[22]

The change in China's waste policy has disrupted the global recycling system.[23] As noted previously, prior to 2018, China imported most of the world's recycled waste, including approximately 31 percent of scrap commodity exports from the United States.[24] Within one year, China cut overall imports of plastic waste by 99 percent,[25] and went from importing 60 percent of the world's plastic waste to less than ten percent.[26] Other waste-importing countries have since attempted to fill the void left by China, but have reached their capacity to handle additional waste.[27]

Without a guaranteed buyer, waste-exporting countries have struggled to manage the recyclable waste they collect. Research suggests that the Chinese ban could displace as much as 111 million metric tons of plastic waste (which otherwise would have been exported to China) by 2030. In the absence of new waste management practices, much of that displaced waste will likely end up in landfills.[28]

B. U.S. Challenges

While China's policy shift presents certain new challenges, it also exposed longstanding issues in the U.S. recycling system. The ability to export vast quantities of waste made recycling simple and profitable, but slowed the development of U.S. markets and infrastructure for

---

[20] Amy L. Brooks, et al., *The Chinese import ban and its impact on global plastic waste trade*, Science Advances (Jun. 20, 2018).

[21] *Plastic Recycling Is Broken. Here's How to Fix It.*, National Geographic (Jun. 20, 2018).

[22] *China says it won't take any more foreign garbage*, Reuters (Jul. 18, 2017).

[23] *Plastics Pile Up as China Refuses to Take the West's Recycling*, The New York Times (Jan. 11, 2018).

[24] Institute of Scrap Recycling Industries, Inc., *China's Scrap Trade Policy* (isri.org/advocacy-compliance/china) (accessed Feb. 24, 2020).

[25] Resource Recycling, *China: Plastic imports down 99 percent, paper down a third* (resource-recycling.com/recycling/2019/01/29/china-plastic-imports-down-99-percent-paper-down-a-third/) (Jan. 29, 2019).

[26] *Why the world's recycling system stopped working*, Financial Times (Oct. 25, 2018).

[27] *See* note 21 and Yale Environment 360, *Piling Up: How China's Ban on Importing Waste Has Stalled Global Recycling* (e360.yale.edu/features/piling-up-how-chinas-ban-on-importing-waste-has-stalled-global-recycling) (Mar. 7, 2019).

[28] *See* note 20.

recovered waste. It similarly allowed consumers to focus on management of their waste, rather than reducing generation of waste in the first place.

In the United States, the growing imbalance between supply and demand for recovered waste has caused the value of recyclable material to plummet.[29] Municipalities – including small and rural towns, in particular – have been hit hardest by the market downturn.[30] Until recently, local governments were typically paid to sell their recyclable waste to processors who, in turn, sold that waste to Chinese importers. Those processors, now lacking buyers, must recover lost profits by charging more to municipal customers.[31]

As a result, many municipalities have scaled back their recycling programs. Some have reduced the types of items they will accept for recycling, while others have canceled their recycling programs altogether.[32] Many local governments are now paying to transport their recovered waste to landfills, or simply instructing households to put certain types of otherwise recyclable materials in the trash.[33]

The expansion of single-stream recycling exacerbated these challenges. Approximately 80 percent of U.S. recycling programs use single-stream recycling, in which all materials – glass, paper, plastic, and aluminum – are collected together, rather than sorted.[34] This approach simplifies recycling for both consumers and waste collectors, but presents challenges for waste-sorting facilities. When combined in a single stream, the various materials mix, break, and contaminate one another; moreover, consumers often inadvertently include unrecyclable (or even hazardous) materials in their recycling.[35] These contaminated waste streams clog processing equipment, lower the value of potentially profitable materials with which they are comingled, and, in some cases, render the entire stream unrecyclable. By one estimate, about one-quarter of the waste in recycling bins is too contaminated and must instead be sent to landfills.[36]

---

[29] *See* note 27.

[30] *How small cities around the country are fighting to save recycling*, Waste Dive (Jan. 28, 2020) (wastedive.com/news/how-small-cities-around-the-country-are-fighting-to-save-recycling/545002).

[31] *See* note 26.

[32] *How many curbside recycling programs have been cut?*, Waste Dive (Feb. 19, 2020) (wastedive.com/news/curbside-recycling-cancellation-tracker/569250).

[33] *Your Recycling Gets Recycled, Right? Maybe, or Maybe Not*, The New York Times (May 29, 2018).

[34] *The Era of Easy Recycling May Be Coming to an End*, FiveThirtyEight (Jan. 10, 2019) (fivethirtyeight.com/features/the-era-of-easy-recycling-may-be-coming-to-an-end).

[35] This phenomenon, in which consumers include materials in their recycling that they mistakenly believe to be recyclable, is known as “wishful” or “aspirational” recycling.

[36] *See* note 34.

These problems are compounded by the lack of domestic markets for recycled materials. When the cost of producing new (or "virgin") materials is lower than the cost of using recovered materials, most producers will choose the less expensive option. Given the relatively low cost of producing virgin plastic, as well as the technical complexity of recycling certain types of plastic, there is often little incentive to use recovered waste.[37]

IV. POLICY SOLUTIONS

Public policy can play a central role in reducing waste and improving the U.S. recycling system. Potential policy mechanisms include:[38]

- Extended producer responsibility (EPR), which shifts the cost of managing post-consumer waste away from municipalities and onto producers;
- Container deposit programs, in which a small fee for packaging is levied at the point of purchase and refunded to the consumer upon return of the original material;
- Post-consumer recycled (PCR) content requirements, which require a minimum amount of recycled material in specified products;
- Fees or taxes on single-use items or certain materials;
- Bans or restrictions on single-use items or certain materials;
- Infrastructure investments to improve waste sorting and processing; and
- Improved labeling and education to clarify recycling rules.

V. WITNESSES

The following witnesses have been invited to testify:

Jenna Jambeck, Ph.D.
Professor, College of Engineering
University of Georgia

Enrique C. Zaldivar, P.E.
General Manager, Los Angeles Sanitation and Environment Bureau
City of Los Angeles

Lynn Hoffman
Co-President
Eureka Recycling

[37] *Economics the key challenge in global recycled plastics markets*, S&P Global Platts (Nov. 26, 2019) (spglobal.com/platts/en/market-insights/latest-news/petrochemicals/112619-commodities-2020-economics-the-key-challenge-in-global-recycled-plastics-markets).

[38] *See, e.g.*, note 6; Ocean Conservancy, *Stemming the Tide: Land-based strategies for a plastic- free ocean* (Sept. 2015); and UCLA School of Law, *Federal Actions to Address Marine Plastic Pollution* (Jan. 2019).

Denise Patel
U.S. Program Director
Global Alliance for Incinerator Alternatives

Keith Christman
Managing Director, Plastic Markets
American Chemistry Council

William H. Johnson
Chief Lobbyist
Institute of Scrap Recycling Industries, Inc.