

February 20th, 2020

Re: HB 438

Dear House Economic Matters Committee Members,

As professionals working and residing in Baltimore City or Baltimore County, and as Maryland ratepayers, we are respectfully writing to summarize relevant public health knowledge regarding the environmental, health, economic and social impacts associated with municipal solid waste incineration. As you consider **House Bill 438** and the future of municipal solid waste incineration's Tier 1 status in Maryland's Renewable Portfolio Standard (RPS), we hope this public health framework is informative.

Trends of Solid Waste Incineration in the U.S.

To contextualize what is known about the broader environmental, economic, social and public health impacts of municipal solid waste incineration in the United States, it is first important to examine the history and re-emergence of this practice. Rates of waste incineration have fluctuated in the United States across the past few decades (National Research Council, 2000). In 1960, roughly 31% of municipal solid waste was combusted in low-efficiency facilities lacking any modern pollution control technologies or energy recovery methods (National Research Council, 2000). In 1980, although incineration facilities only received 9% of municipal solid waste, by 1990 incineration accounted for 16% of the total waste processed (National Research Council, 2000). From the 1970s until 1996, approximately 300 new incineration facilities were proposed but did not manifest following assorted efforts by business coalitions and citizen groups (Seldman, 2018a). After 1996, only one new solid waste incinerator was built in the United States, although approximately 150 incineration facilities were put forward and struck down (Seldman, 2018a). In 2010, a "Waste to Energy" project site called the 'Fairfield Renewable Energy Project' was proposed in Baltimore's Curtis Bay neighborhood. Extensive youth-lead community organizing and demonstrations emerged against the proposed facility, highlighting the nearby location to neighborhood schools and homes (Fabricant, 2018). These varied, community led efforts in part contributed to the Maryland Department of Environment (MDE) pulling the project permit in 2016, while instigating city-wide interest and efforts relating to a zero waste future in Baltimore City (Fabricant, 2018).

Is Burning Trash Renewable?

The Maryland Public Service Commission classifies "Solar, Wind, Qualifying Biomass, Methane from a landfill or wastewater treatment plant, Geothermal, Ocean, Fuel Cell that produces electricity from a Tier 1 source, Hydroelectric power plants of less than 30 MW capacity, Poultry litter-to-energy, Waste-to-energy, and Refuse-derived fuel" as Tier 1 sources in the states' RPS. One of these fuel sources clearly does not belong with the others. Waste management systems that involve the incineration of municipal solid waste depend on a steady, fixed stream of incoming

materials to burn. A waste management system that relies on the continued practice of consuming, disposing and burning of new products made of finite resources and products is inherently non-renewable and run counter to the state RPS. A substantial portion of the municipal solid waste that is presently incinerated could specifically be diverted into usable compost to promote urban gardens and agriculture (Donahue, 2018). Estimates from the Clean Water Organization, examining national data and waste characterization studies from other states, maintain that 50% of all city municipal solid waste in Baltimore City could be diverted from the incinerator and instead could be used for generating compost (Jennifer Kunze, 2019; State of Washington Department of Ecology, Cascadia Consulting Group, 2018). Furthermore, incineration tends to encourage more rather than less solid waste volume in order to reach and maintain economies of scale for competitive energy production (Donahue, 2018, Seldman, 2018b). Such an incentive towards the production of more solid waste runs counter to the core principle of a renewable approach to solid waste management which would encourage reduction, reuse, recycling, composting and recovery of solid waste materials (Donahue, 2018).

Health Impacts of Air Pollution from Solid Waste Incineration; Community Movements

It is important to highlight that emissions results in health impacts in surrounding communities. The main pollutants released from solid waste incinerators include carbon monoxide, particulate matter (PM), nitrous oxides, sulfur dioxides, chromium VI, formaldehyde, hydrogen chloride, hydrogen fluoride, lead, mercury and nickel (Maryland Department of the Environment, 2013). Some of the health outcomes associated with the type of air pollutants released by incineration facilities include heart attacks, cancer, asthma attacks and resulting emergency department visits or hospitalizations, compromised neurological conditions or mental health states and death (Ostro, 2004; Thompson and Anthony, 2005). It is worth noting that Baltimore City hosts the highest air emissions-related mortality rate in the United States, where every single year 130 out of every 100,000 city residents are likely to die as a result of long-term exposure to air pollution (Caiazzo et al., 2013). *A single stationary source, the Wheelabrator Incinerator, produces and contributes the majority of air pollution in Baltimore City while the Curtis Bay neighborhood adjacent to the facility is one of the top ten zip codes in the United States with the greatest quantity of toxic air pollutants released by stationary facilities (EPA's Toxic Release Inventory, 2016; Caiazzo et al., 2013; Environmental Integrity Project, 2011).*

Investigations by the Environmental Integrity Project have determined that the average rate of asthma-related hospitalizations in Baltimore City is roughly double that of Maryland's average rate, and three times greater than the United States national average rate (Kelly and Burkhart, 2017). Curtis Bay has recently had the worst air quality in the state of Maryland while also being ranked second worst in the country for total toxic air emissions (Environmental Integrity Project, 2012). The rates of asthma and respiratory illness or disease in the Curtis Bay region are amongst the highest in the United States as well (Baltimore City Health Department, 2017). As children are in a more vulnerable physiological state, asthma emerges as the greatest cause of school and sport absenteeism in Baltimore while younger aged children in Baltimore are hospitalized at greater rates than other age groups (Baltimore City Health Department, 2017; Kelly and Burkhart, 2017).

Assorted investigations have documented how the inequitable allocation of environmental exposures pertaining to waste management risks have contributed to broader demands for environmental justice, both across the nation and here in Baltimore (Fabricant, 2018, Rootes 2009). Reviews of both peer-reviewed literature and additional documents including government documents, working papers, white papers, reports and evaluations, amongst others, have found that available data consistently point to waste facilities, including trash incinerators, typically being disproportionately situated in zones with lower income residents or households with ethnic or racial minorities (Martuzzi et al, 2010). Speaking of her neighborhood Curtis Bay, Benjamin Franklin High School graduate and leading community organizer Destiny Watford pointedly stated, “to put an incinerator in a place that already had so much pollution was a violation to our basic human rights (Fabricant, 2018).”

Net Reductions in Solid Waste and Principles of Zero Waste

From the perspective of mitigating the impacts of climate change and protecting public health-- which is at the core of Maryland’s RPS principles and inclusion of eligible Tier 1 renewable energy sources -- principles such as Zero Waste represent a renewable approach of solid waste management. Considering the greater quantities of greenhouse gases that trash incineration releases per unit of energy when compared to coal, one of the most polluting fossil fuels, it remains clear that Zero Waste endeavors support the mitigation and protective public health and climate change goals of the state’s RPS (Ewall, N.D.). Zero Waste practices seek to advance an overall reduction in the quantity of solid waste that is generated in the first place, minimizing the resulting products that must be ultimately managed and properly repurposed or disposed.

In 2017, the Maryland Department of Legislative Services determined that 10% of Renewable Energy Credits, while meant to bolster truly renewable energy sources while advancing renewable job infrastructure in the state, were allocated to trash incineration (Delegate Mosby, 2019). This year’s fiscal note determined that The Baltimore City Council has already adopted Resolution 17-0029R in 2017 and Council Bill 18-0086R in 2018, specifically urging Baltimore to develop a solid waste management plan limiting the use of municipal solid waste incineration while pursuing zero waste strategies (Baltimore City Council 2017, Baltimore City Council 2018). Additional central components to these measures include the deliberate aim to terminate the usage of municipal solid waste incineration by 1/1/2022, amongst other measures aiming to advance citywide zero waste efforts (Baltimore City Council 2017, Baltimore City Council 2018).

Many cities, institutions, educational institutes and organizations across the globe are already striving to and making progress in implementing goals of achieving Zero Waste in their communities. Movements are centered around buying less, including purchasing alternative products with less packaging or which are made of reusable materials, reusing what one already has, while then recycling and composting remaining materials. Baltimore City has already pledged to work towards achieving Zero Waste as part of efforts to become a cleaner, healthier city while simultaneously reducing the quantity of landfill and incineration waste generated (Baltimore Office of Sustainability, 2019).

The Baltimore City Office of Sustainability specifically determined that 82% of household items in Baltimore could either be recycled or composted from a 2014, “Waste to Wealth: Baltimore Waste Stream Analysis” report (Seldman, 2018). Specifically, various institutions within the city, including the Maryland Institute College of Art (MICA) Towson University, the University of Maryland Baltimore County and the Johns Hopkins University, amongst others, are similarly striving towards net reductions in the total amount of waste generated at their campuses. Meaningful efforts are already being realized; the Johns Hopkins Bloomberg School of Public Health has achieved a waste diversion rate of 73.2% while efforts are underway to further limit the amount of waste generated across all institutional campuses (Johns Hopkins Office of Sustainability, 2016).

Legislative efforts in Maryland that banned Styrofoam demonstrate broader momentum to further reduce waste at its source. HB589 being considered this 2020 Spring legislative session would use a phased approach to gradually require large generators of organic waste to divert their waste if appropriate facilities exist nearby. Movements to limit waste streams are multifaceted but principles such as Zero Waste appear to be gaining momentum across the country and state.

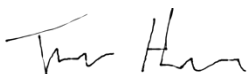
Job growth amidst the Zero Waste Movement

A Zero Waste Future will be beneficial in terms of total jobs generated. Specifically, within Maryland for every 10,000 tons of compostable waste sent to composting facilities a demand for 4.1 full time jobs is generated, as compared to 2.1 jobs at landfills and 1.2 jobs at incinerators to process the same materials (Donahue, 2018). When compared to incineration, recycling similarly produces 10 times more jobs per ton of materials processed (Institute for Local Self-Reliance, 2002). Investigations have revealed that for every \$10 million invested in composting facilities within Maryland, twice as many jobs than landfills and 17 more jobs than incinerators are generated, on a per capital investment basis. (Seldman, 2018b). Other studies modeled that 500 direct jobs would be created if recycling rates were increased, finding that recycling and composting can generate five to ten times more jobs when compared to trash incineration (Seldman, 2018b). Reports have further found that reuse management programs, like resource recovery facilities found across the nation, yield 75 to 250 jobs per every 10,000 tons of materials processed (Seldman, 2018b). The Teamsters Union, amongst other labor groups, have already expressed their interest in the jobs that have and will continue to be generated through the Zero Waste movement across the nation and here in Baltimore. The organization maintains that a 75% diversion rate for municipal solid waste and construction and demolition debris by 2030 would result in 2.3 million jobs, nearly two times the amount of jobs projected from a business as usual scenario (Goldstein and Electris, 2011).

As environmental and public health scientists we hope that this information about public health risks associated with municipal solid waste incineration in Baltimore is useful as you consider **House Bill 438**.

This letter does not reflect the views of the Johns Hopkins University.

Sincerely,



Toby Harris

MHS Student

Environmental Health and Engineering

Johns Hopkins Bloomberg School of Public Health

Baltimore, Maryland, USA



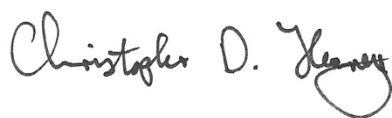
Emma Moynihan, MPH

PhD Student

Environmental Health and Engineering

Johns Hopkins Bloomberg School of Public Health

Baltimore, Maryland, USA



Christopher D. Heaney, PhD, MS

Associate Professor

Environmental Health and Engineering, Epidemiology, International Health

Johns Hopkins Bloomberg School of Public Health

Baltimore, Maryland, USA



Megan Weil Latshaw, PhD, MHS
MHS & ScM Degree Program Director
Environmental Health and Engineering
Johns Hopkins Bloomberg School of Public Health
Baltimore, Maryland, USA



Alina McIntyre
MHS Student
Environmental Health and Engineering
Johns Hopkins Bloomberg School of Public Health
Baltimore, Maryland, USA



Breanne Kincaid
ScM Student
Environmental Health and Engineering
Johns Hopkins Bloomberg School of Public Health
Baltimore, Maryland, USA



Zain Kazi
MHS Student
Environmental Health and Engineering
Johns Hopkins Bloomberg School of Public Health
Baltimore, Maryland, USA

References

- Baltimore City Council. (2017). Informational hearing - moving Baltimore to zero waste. Retrieved from <https://baltimore.legistar.com/LegislationDetail.aspx?ID=3029411&GUID=6550D772-9BD4-4E93-8895-A81B53C31DFE&Options=&Search=>
- Baltimore City Council. (2018). Improving development of a Baltimore city recycling and solid waste management master plan. Retrieved from <https://baltimore.legistar.com/LegislationDetail.aspx?ID=3503406&GUID=66375255-F240-4DDF-8023-6054E2F94786>
- Baltimore City Health Department. Baltimore City 2017 Neighborhood Health Profile. June 2017. [https://health.baltimorecity.gov/sites/default/files/NHP%202017%20-%2004%20Brooklyn-Curtis%20Bay-Hawkins%20Point%20\(rev%206-9-17\).pdf](https://health.baltimorecity.gov/sites/default/files/NHP%202017%20-%2004%20Brooklyn-Curtis%20Bay-Hawkins%20Point%20(rev%206-9-17).pdf)
- Baltimore City Health Department. (2018). Asthma. Retrieved from <https://health.baltimorecity.gov/node/454>
- Baltimore Office of Sustainability (2019). *The 2019 Baltimore Sustainability Plan* . https://www.baltimoresustainability.org/wp-content/uploads/2019/01/SustainabilityPlan_Compressed_01-28-19.pdf
- Brenda Platt, Bobby Bell, and Cameron Harsh, Institute for Local Self Reliance. (2013). *Pay dirt composting in Maryland to reduce waste, create jobs, & protect the bay*. Retrieved from <https://ilsr.org/wp-content/uploads/2013/05/Pay-Dirt-Report.pdf>
- Caiazzo, F., Ashok, A., Waitz, I. A., Yim, S. H., & Barrett, S. R. (2013). *Air pollution and early deaths in the United States*. Part I: Quantifying the impact of major sectors in 2005. *Atmospheric Environment*, 79, 198-208. <http://www.sciencedirect.com/science/article/pii/S1352231013004548>
- Delegate Mosby. (2019). *FISCAL AND POLICY NOTE first reader: Public utilities - renewable energy portfolio standard - tier 1 sources*. Retrieved from http://mgaleg.maryland.gov/2019RS/fnotes/bil_0001/hb0961.pdf
- Donau, M. (2018) Waste Incineration: A Dirty Secret In How States Define Renewable Energy. Institute For Local Self Reliance. <https://ilsr.org/wp-content/uploads/2018/12/ILSRIncinerationFinalDraft-6.pdf>
- Environmental Integrity Project. (2012). *Air Quality Profile of Curtis Bay, Brooklyn and Hawkins point, Maryland*. Retrieved from http://www.environmentalintegrity.org/wp-content/uploads/2016/11/2012-06_Final_Curtis_Bay.pdf

- Environmental Integrity Project. (2011). *Waste-To-Energy: Dirtying Maryland's Air by Seeking a Quick Fix on Renewable Energy* http://environmentalintegrity.org/wp-content/uploads/2011-10_WTE_Incinerator.pdf
- Environmental Protection Agency (2016). *Toxic Release Inventory*. <https://www.epa.gov/toxics-release-inventory-tri-program>
- Ewall, M. *FACT SHEET trash incineration ("Waste-to-energy")*. Energy Justice Network. Retrieved from <http://www.energyjustice.net/files/incineration/trashincineration.pdf>
- Fabricant, N. (2018). The Environmental Justice Movement in South Baltimore: United Workers Take on the Multiple Crises of Capitalism; *New Politics*, 16(4) Retrieved from https://newpol.org/issue_post/environmental-justice-movement-south-baltimore/
- Goldstein, J., & Electric E. (2011). *More Jobs, Less Pollution: Growing the Recycling Economy in the U.S.* Tellus Institute with Sound Resource Management. https://www.nrdc.org/sites/default/files/glo_11111401a.pdf
- Institute for Local Self-Reliance (2000) *Recycling Means Business*. <https://ilsr.org/recycling-means-business/>
- Kelly, L., & Burkhart, K. (2017, December). *Asthma and Air Pollution in Baltimore City*(Rep.). Retrieved <https://www.environmentalintegrity.org/wp-content/uploads/2017/12/Baltimore-Asthma.pdf>
- Kunze, J. (2019). Municipal compost in Baltimore and beyond. Retrieved from <https://www.cleanwateraction.org/2019/05/07/municipal-compost-baltimore-and-beyond>
- Martuzzi M., Mitis F., & Forastiere F, Inequalities, inequities, environmental justice in waste management and health, *European Journal of Public Health*, Volume 20, Issue 1, February 2010, Pages 21–26, <https://doi.org/10.1093/eurpub/ckp216>
- Maryland Department of the Environment. (2013). Frequently Asked Questions About Waste-to-Energy Facilities. http://www.mde.state.md.us/programs/Air/Documents/www.mde.state.md.us/assets/document/Air/MDE_OC_EA_FAQs.pdf
- National Research Council, Commission on Life Sciences, Board on Environmental Studies and Toxicology, & Committee on Health Effects of Waste Incineration. *Waste incineration and public health: Chapter 2 Waste incineration overview*. Washington, DC: Retrieved from <https://www.nap.edu/read/5803/chapter/4>
- Office of Sustainability. Johns Hopkins Sustainability Report. Johns Hopkins University; 2016.
- Ostro, B. (2004). Outdoor air pollution. WHO Environmental Burden of Disease Series, 5. http://www.who.int/quantifying_ehimpacts/publications/ebd5.pdf?ua=1

Seldman, N. (2018a). Anti-garbage incineration around the globe, A review. Retrieved from <https://ilsr.org/global-anti-incineration-2018/>

Seldman, N. (2018b). Report: Why Should Baltimore Recycle More? Retrieved from <https://ilsr.org/wp-content/uploads/2017/03/Why-Should-Baltimore-Recycling-More-Report-final.pdf>

State of Washington Department of Ecology, Cascadia Consulting Group. (2018). *2016 Washington Statewide waste characterization study*. Retrieved from <https://fortress.wa.gov/ecy/publications/documents/1607032.pdf>

Thompson, J., & Anthony, H. (2005). The health effects of waste incinerators. *Journal of Nutritional & Environmental Medicine*, 15(2-3), 115-156.
<http://www.durhamenvironmentwatch.org/Incinerator%20Files/HealthEffectsOfWasteIncinerators.pdf>

Rootes, C. (2009) Environmental movements, waste and waste infrastructure: an introduction, *Environmental Politics*, 18:6, 817-834,
<https://www.tandfonline.com/doi/full/10.1080/09644010903345587>