

February 4th, 2021

Re: HB0332

Dear House Economics Matters Committee Members,

As professionals who live, work, teach or hold further ties to Baltimore City and Baltimore County, 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 0332** 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 public health impacts of municipal solid waste incineration in the United States, it is important to examine the historical trends 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 modern pollution control technologies or energy recovery methods (National Research Council, 2000). In 1980, incineration facilities received just 9% of total municipal solid waste, and by 1990 these plants processed 16% of such waste (National Research Council, 2000). From the 1970s until 1996 approximately 300 new incineration facilities were proposed but were not built, often met with assorted countering efforts from business coalitions and neighboring citizen groups (Seldman, 2018a).

After 1996, one new solid waste incinerator was built in the United States, as roughly 150 additional incineration facilities were put forward across the nation but subsequently struck down (Seldman, 2018a). In 2010, a "Waste to Energy" project site called the 'Fairfield Renewable Energy Project' was proposed in Baltimore City's Curtis Bay neighborhood. *Youth led and organized demonstrations against the proposed facility emerged, with community members highlighting the proposed facility's nearby location to their neighborhood schools and homes in this environmental justice community (Fabricant, 2018).* These community protest 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 Baltimore City's Zero Waste future (Fabricant, 2018).

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

It remains significant to highlight the health impacts connected to varying human exposures to pollutions produced from municipal solid waste incineration. The main pollutants released from incinerators include carbon monoxide, carbon dioxide, particulate matter (PM), nitrous oxides, sulfur dioxides, chromium VI, formaldehyde, hydrogen chloride, hydrogen fluoride, lead, mercury and nickel (Maryland Department of the Environment, 2013). Systematic reviews of existing research have clarified specific diseases and further symptoms connected to human exposures to incineration pollution. *Some of these health outcomes specifically include neoplasia, cancer, heart*

attacks, asthma attacks or other respiratory issues resulting in emergency department visits and hospitalizations, compromised neurological conditions or mental health states, congenital abnormalities, miscarriages, infant death and increased risk of general mortality (Franchini, 2004; Mattiello, 20013; Ostro, 2004; Tait, 2020; 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 roughly 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 BRESKO Wheelabrator Incinerator, produces and contributes a sizable portion of air pollution in Baltimore City; the adjoining Curtis Bay neighborhood is one of the top ten zip codes in the United States with the greatest quantity of toxic air pollutants released by such 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 and the following potential health impacts pertaining to such waste management risks have contributed to broader demands for environmental justice, both across the nation and here in Baltimore City (Fabricant, 2018; Rootes, 2009; Thurston 2017). *Reviews of peer-reviewed literature and additional government documents, reports, working and white papers, in addition to evaluations of available data have consistently revealed that waste facilities such as trash incinerators are disproportionately zoned in areas that house residents of color and households with lower reported incomes (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)."

Is Burning Trash Renewable?

Net Reductions in Solid Waste and Principles of Zero Waste

The Maryland Public Service Commission presently classifies "Solar (Tier 1 Solar), Wind, Qualifying Biomass, Methane from a landfill or wastewater treatment plant, Geothermal, Ocean, small Hydroelectric power, Poultry litter-to-energy, Waste-to-energy, and Processed refuse fuel" as eligible Tier 1 renewable sources. *As Maryland ratepayers invested in the appropriate inclusion of renewable sources in the state's RPS, upon examination it is evident some of these fuel sources do not belong with the others.* For instance, a waste management system that relies on a steady,

fixed stream of incoming materials to burn is inherently non-renewable. This form of materials management further runs counter to the energy efficiency aims of the state RPS, especially understanding that trash incineration facilities emit more greenhouse gases per ton than coal, often considered the dirtiest of fossil fuels (Ewall, N.D.).

From the perspective of mitigating the impacts of climate change and protecting public health-- which is at the core of Maryland's RPS and subsequent inclusion of eligible Tier 1 renewable energy sources -- principles such as Zero Waste represent a truly renewable approach to municipal solid waste management. *However, in 2017, the Maryland Department of Legislative Services determined that 10% of Renewable Energy Credits, meant to bolster truly renewable energy sources while advancing renewable job infrastructure in the state, were allocated to trash incineration* (Delegate Mosby, 2019). Considering the greater quantity 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 is needed further support the mitigation and protective public health and climate change goals of the state's RPS (Ewall, N.D.).

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). These incentives towards the production of more solid waste again run counter to the core principle of a renewable approach to solid waste management. Zero Waste initiatives would encourage an overall reduction in the quantity of solid waste generated in the first place, minimizing the resulting products that must be properly managed through reuse, recycling, composting and recovery of solid waste materials through salvage programs (Donahue, 2018). *Specifically, in a 2014 "Waste to Wealth: Baltimore Waste Stream Analysis" report, the Baltimore City Office of Sustainability determined that 82% of household items in Baltimore could either be recycled or composted* (Seldman, 2018). A substantial portion of the municipal solid waste that is presently incinerated could specifically be further diverted and processed into usable compost, supporting 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 for compost generation (Jennifer Kunze, 2019; State of Washington Department of Ecology, Cascadia Consulting Group, 2018).

Many cities, institutions, educational institutes, and organizations across the globe are already striving to and making progress in implementing and achieving Zero Waste goals in their communities. 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 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% in recent years* while efforts are underway to further limit the amount of waste generated across all institutional campuses (Johns Hopkins Office of Sustainability, 2016). Such Zero Waste movements are centered around buying less, including purchasing alternative products with less packaging or which are made of reusable materials, reusing what's already available, while then recycling and composting remaining materials.

Efforts to limit waste streams are multifaceted but principles such as Zero Waste appear to be gaining momentum across the country and state. 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). *In March 2020, Baltimore City's Council adopted council bill 20-0202R for the purpose of calling all affected City agencies, the Board of Estimates and Mayor to formally acknowledge and move forward in implementing Baltimore's community driven 'Fair Development Plan for Zero Waste 2020-2040'* (Baltimore City Council 2020; Fair Development Roundtable, 2020). Community organizers continue to advise Mayor Scott on Zero Waste priority policy recommendations through his environmental transition team. Members from assorted Baltimore institutions remain engaged in community driven, Zero Waste coalitions and look forward to ongoing efforts with our partners across the city.

Job growth amidst the Zero Waste Movement

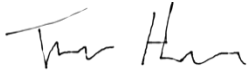
A Zero Waste Future will be beneficial in terms of total jobs generated; implementing Baltimore's Fair Development Plan for Zero Waste would generate approximately 1,800 jobs (Fair Development Roundtable, 2020). More broadly, in Maryland for every 10,000 tons of compostable waste sent to composting facilities a demand for 4.1 full time jobs is generated, as compared to 2.1 jobs at landfills and 1.2 jobs at incinerators needed 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).

Furthermore, reports and assorted investigations have found that reuse management programs, like resource recovery facilities located 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 number of jobs projected from a business-as-usual scenario (Goldstein and Electris, 2011).

As environmental and public health scientists invested in our communities, we hope that this information about public health risks associated with municipal solid waste incineration is useful as you consider **House Bill 0332**.

This letter does not reflect the views of the Johns Hopkins University or the Baltimore City Health Department's Covid-19 Response Program.

Sincerely,



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References

Baltimore City Council (2020). Baltimore's Fair Development Plan for Zero Waste: 2020-2040 and Beyond. Retrieved <https://baltimore.legistar.com/LegislationDetail.aspx?ID=4390594&GUID=1386D7E3-E047-4518-A74F-AF63FEFD7FEC&Options=ID%7CText%7C&Search=>

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_Companded_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

Donaue, 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/

Fair Development Roundtable., Liss, G., Abbe R., Seldman N., Platt B., (2020). *Baltimore's Fair Development Plan for Zero Waste*. <https://cdn.ilsr.org/wp-content/uploads/2020/02/BaltimoreZeroWastePlan2020.pdf>

Franchini, Michela; Rial, Michela; Buiatti, Eva; Bianchi, Fabrizio (2004). "[Health effects of exposure to waste incinerator emissions:a review of epidemiological studies](#)". *Annali dell'Istituto Superiore di Sanita*. 40 (1): 101–115. [ISSN 0021-2571](#). [PMID 15269458](#).

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

Mattiello, Amalia; Chiodini, Paolo; Bianco, Elvira; Forgiione, Nunzia; Flammia, Incoronata; Gallo, Ciro; Pizzuti, Renato; Panico, Salvatore (October 2013). "Health effects associated with the disposal of solid waste in landfills and incinerators in populations living in surrounding areas: a systematic review". *International Journal of Public Health*. 58 (5): 725–735. [doi:10.1007/s00038-013-0496-8](https://doi.org/10.1007/s00038-013-0496-8). [ISSN 1661-8556](#). [PMID 23887611](#). [S2CID 11965218](#)

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>

Tait, Peter W.; Brew, James; Che, Angelina; Costanzo, Adam; Danyluk, Andrew; Davis, Meg; Khalaf, Ahmed; McMahon, Kathryn; Watson, Alastair; Rowcliff, Kirsten; Bowles, Devin (February 2020). "[The health impacts of waste incineration: a systematic review](#)". *Australian and New Zealand Journal of Public Health*. **44** (1): 40-48. doi:[10.1111/1753-6405.12939](https://doi.org/10.1111/1753-6405.12939). ISSN [1326-0200](https://doi.org/10.1111/1753-6405.12939). PMID [31535434](https://pubmed.ncbi.nlm.nih.gov/31535434/). S2CID [202690120](https://pubmed.ncbi.nlm.nih.gov/31535434/).

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>

Thurston, G. (2017). WRITTEN REPORT OF GEORGE D. THURSTON REGARDING THE PUBLIC HEALTH IMPACTS OF AIR EMISSIONS FROM THE WHEELABRATOR FACILITY
<https://www.cbf.org/document-library/cbf-reports/thurston-wheelabrator-health-impacts-2017.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>