To: Miami-Dade County Board of County Commissioners
From: Michael Ewall, Esq., Executive Director, Energy Justice Network
Date: February 18, 2025
Re: Misinformation on county website promoting incineration

Dear Chair Rodriguez, Vice-Chair McGhee, and members of the Board of Commissioners,

I was asked to respond to some of the many statements on the county's webpage that was set up in late 2024 to sell a new incinerator to the county. Please find my response to six of the statements below, which I have carefully reviewed and researched to better inform you of the choices before you.

Please know that I am available as a resource to provide a well-researched and fact-based alternative to the pro-incinerator side of the story that has predominated among the county administration and its hired consultants.

While you are right to be concerned about the landfills in the county, let this not be a reason to think that incineration is preferred. As you have received in the January 24, 2025 communication from the City of Miramar, one of the three studies that we produced examines the many landfills available to you, and found 12 of them that are better choices than the three in the county.[1]

Please feel free to follow up with any questions.

Sincerely,

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[1] "Most Responsible Landfill Options for Miami-Dade County," Energy Justice Network, Jan. 2025. https://www.energyjustice.net/fl/landfills.pdf

Response to misinformation about "waste-to-energy" (trash incineration) on Miami-Dade County website

In November 2024, Miami-Dade County government put up a webpage titled "**The Future of Solid Waste in Miami-Dade**" to promote so-called "waste-to-energy" (trash incineration), repeating a litany of misinformation supporting the trash incineration industry: https://www.miamidade.gov/global/solidwaste/sustainable-solid-waste/wte-home.page

"Waste-to-energy" (WTE) is an unscientific public relations term that is typically used to describe trash incinerators that recover small amounts of energy in the form of electricity and or steam for heating. All commercial trash incinerators in the U.S. have systems to recover energy, so this is not special or unusual. In fact, energy sales are necessary for such expensive facilities to operate financially, reducing their need for public subsidies.

There is no such thing as "waste-to-energy." Waste is not literally being turned into energy by incinerators, which would violate the laws of physics. Matter cannot be turned into energy without a nuclear reaction, and thankfully, that is not what happens in trash incinerators. In reality, waste is turned into ash and air emissions and every ton that goes in comes out… nearly 30% in the form of ash, and the rest goes up the smokestack.

Yes, a small fraction of the energy in the waste is recovered in the process. However, if the same materials fed to incinerators were recycled and composted, avoiding the need to extract and produce products from raw materials, it would save 3-5 times as much energy as an incinerator can "recover." This is, in part, because much of the energy it takes to mine minerals or grow plants and trees and process them into products is not physically present in the product anymore and cannot be recovered by burning them. To the extent that they compete with recycling and composting, it is more accurate to call trash incinerators "waste-OF-energy" facilities.

Rather than use biased public relations terms, this document properly refers to them as trash incinerators, which the U.S. Environmental Protection Agency says is synonymous with municipal waste combustors, the legal term used to regulate the industry.

COUNTY'S CLAIM:

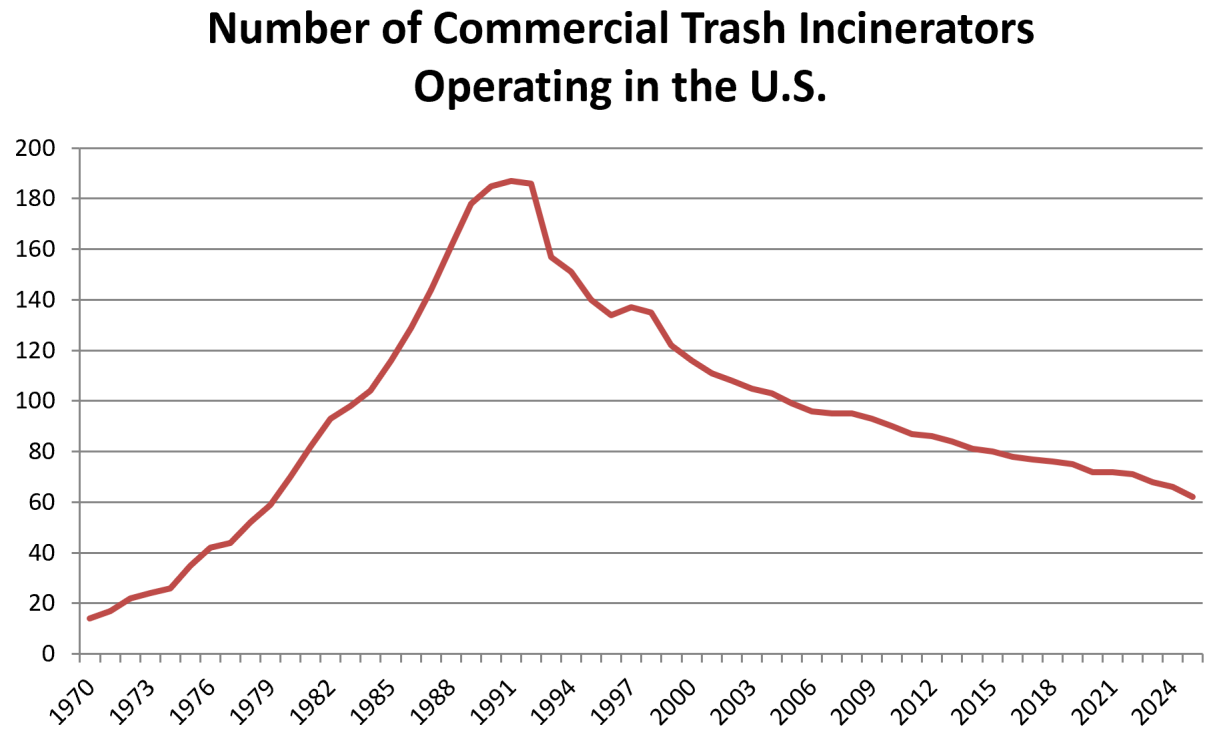
How many waste-to-energy facilities are there nationwide?

Currently, there are 75 facilities in the United States that recover energy from the combustion of municipal solid waste. These facilities exist in 25 states, mainly in the Northeast.

Florida processes more solid waste through waste-to-energy plants in the country than any other state. Our state has plants in Miami-Dade (our current facility is closed as the new one is being planned), Palm Beach, Broward, Hillsborough, Lee, Pinellas and Pasco counties and the City of Tampa.

FACT: This county webpage was created in November 2024. "Currently" at the time, there were only 64 "waste-to-energy" trash incinerators operating in the U.S., not 75. There are now 62 as of mid-February 2025. There have not been as many as 75 operating since 2019, calling into question the reliability of information from the county and its consultants who were unaware of the last 11 incinerator closures in the past five years, one of which is the county's own incinerator that closed after a 3-week fire in February 2023.

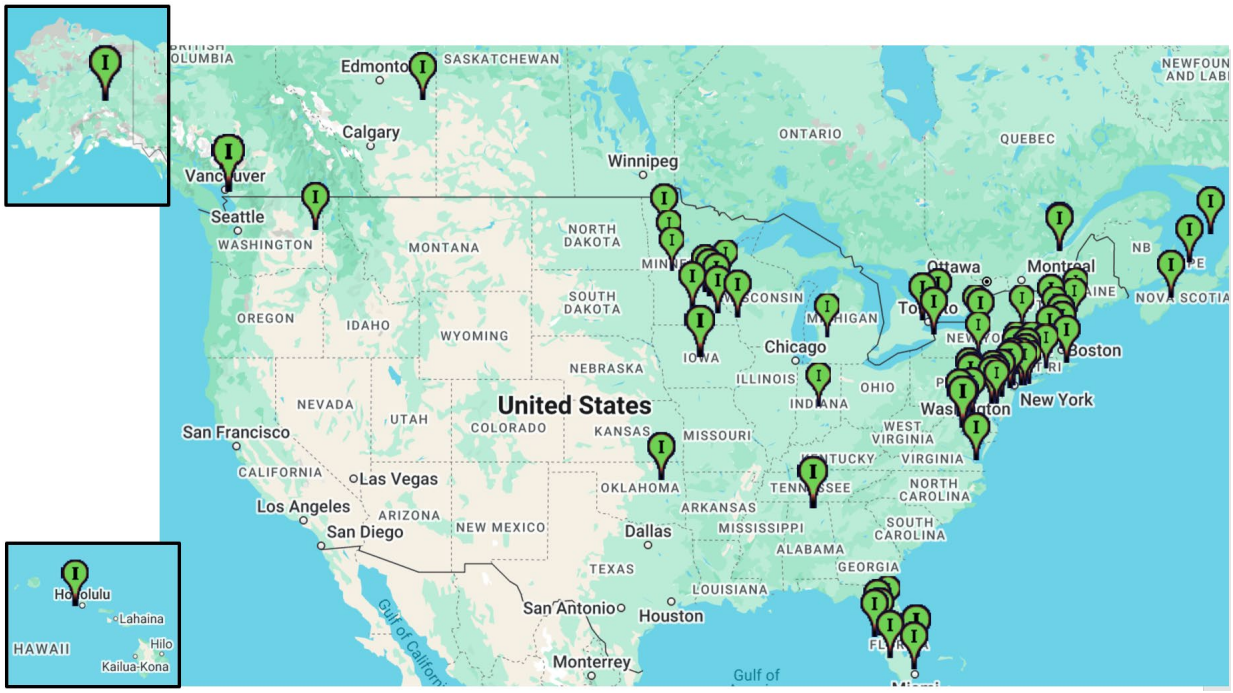
When the website was written, there were only "waste-to-energy" trash incinerators operating in 21 states, not 25. With the closure of the last incinerators in California and Oregon since December 2024, it is now just 19 states: AL, CT, FL, HI, IA, IN, MA, MD, ME, MI, MN, NH, NJ, NY, OK, PA, VA, WA, and WI. There have not been "waste-to-energy" trash incinerators operating in as many as 25 states since 2008, 16 years before the "currently" statement on the county website was written, when such incinerators were still operating in GA, NC, SC, and UT.



Despite hundreds of incinerator siting attempts, no new trash incinerators have been developed at a new site in 30 years, since 1995 when the incinerators in Lisbon, CT and Montgomery County, MD were built. A handful have been rebuilt or expanded in that time, and one new facility was built on an existing site, adjacent to the incinerator in West Palm Beach, FL. With that sole exception, efforts to site, finance and build new incinerators in the U.S. have been abandoned or defeated every time, typically due to high costs, community opposition, or a combination of these factors.

A more accurate description of the geography of trash incinerators is "mainly in the Mid-Atlantic and Northeast plus Florida and Minnesota."

Map of operating commercial trash incinerators in North America
(as of February 17, 2025)



It is true that "Florida processes more solid waste through waste-to-energy [sic] plants in the country than any other state." Florida also had the largest number of operating trash incinerators in the nation (12) until Wheelabrator North Broward closed in 2015, then Bay County Waste Facility closed in 2021, bringing the number to 10, tied with the number still operating in the state of New York. With the closure of the Miami-Dade incinerator, Florida now has nine operating trash incinerators while New York still has ten. However, Florida's are larger, burning more waste than any other state. 20% of all of the trash burned at U.S. incinerators occurs in Florida, significantly more than the 15% burned in the state of New York.

The county's list of Florida counties with trash incinerators is missing Lake County.

COUNTY'S CLAIM:

How many waste-to-energy facilities are there around the world?

Currently around 15% of the of global waste collected is processed in waste-to-energy plants, most of which are located in Japan, the U.S. and Europe. Worldwide there are currently 2,700 waste-to-energy plants. Europe has 400 plants, while the United States has 75; ten of those are in Florida.

The newest waste-to-energy plant will be in Warsaw, Poland which is expected to begin operations in 2024. In the United States, the Palm Beach County Solid Waste Authority (SWA) began commercial operations in 2015. It was the first greenfield waste-to-energy facility to

come online in North America in 20 years. In 2023, Pasco County awarded a contract to Reworld, formerly Covanta, to expand their waste-to-energy facility from 1,050 tons per day to 1,565 tons per day. This expansion will be the first of its kind since the SWA project in 2015.

FACT: Since the website does not show its data sources, it's unclear whether the "currently" 15% figure is any more accurate or up-to-date as the incorrect answers to the previous question. It seems slightly exaggerated, however. According to a 2018 report by the World Bank Group, 11% of waste is incinerated globally with "modern incineration."[2] 2020 data in a 2024 United Nations report puts the figure at 13%.[3] Data from the World Bank Group, listed as last updated on June 4, 2024, also shows the global percentage to be 13%.[4]

It is true that most incinerators are in Japan, the U.S. and Europe. China is also now a major source of waste incinerator, leading the world with 43% of the worlds waste incineration tonnage according to the World Bank Group's 2024 data. Japan and the U.S. are a distant second and third place. The incineration industry has long known and admitted that their market in the U.S. is dead and that their growth market is in Asia, not the U.S. or even Europe.

While incomplete and outdated, the D-Waste Atlas map confirms the general trend of incinerators largely existing in Japan, the U.S., and Europe.[5]

[2] Kaza, Silpa; Yao, Lisa C.; Bhada-Tata, Perinaz; Van Woerden, Frank, "What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050," Urban Development, 2018, Figure 2.12, p. 34. https://openknowledge.worldbank.org/entities/publication/d3f9d45e-115f-559b-b14f-28552410e90a; Summary charts also available at: https://datatopics.worldbank.org/what-a-waste/trends_in_solid_waste_management.html

[3] United Nations Environment Program, "Beyond an Age of Waste - Global Waste Management Outlook 2024," Figure 7, p. 21. https://www.unep.org/resources/global-waste-management-outlook-2024

[4] "Country level dataset," World Bank Group Data Catalogue, Jun. 4, 2024. https://datacatalog.worldbank.org/search/dataset/0039597

[5] http://www.atlas.d-waste.com

The county's claim that there are currently 2,700 incinerators worldwide closely matches an industry research group's statement that, "[a]s of early 2024, there were more than 2,800 WtE plants worldwide."[6] The county's claim that Europe has 400 plants may be understated, as the U.S. Waste-to-Energy Association claims there are 522. However, they also claim that there are 75 in the U.S. when there are now 62.[7] A more current source states that there were 498 in 2022.[8] The county's website also claims that there are ten in Florida when it knows better than anyone that its incinerator burned down in 2023 and is closed for good (any new incinerator would be a separate facility and a decade away), bringing the number in the state down to nine.

The county website mentions that the newest incinerator (in Europe?) will be in Warsaw, Poland, to begin operations in 2024. While this facility would be the largest in Poland, it is 1/5th the size of the 4,000 ton/day incinerator being discussed in Miami-Dade County, and would be illegal to operate in Miami-Dade County because it lacks modern controls for the nitrogen oxides (NOx) that trigger asthma attacks – controls that, among U.S. incinerators, only the newer incinerator in Palm Beach County has installed.[9]

The newer of two incinerators in Palm Beach County, Florida did begin commercial operations in 2015, as claimed, but was not the first "greenfield" incinerator to be built in 20 years. It sits adjacent to another incinerator on the same county property in a waste complex managed by the Palm Beach County Solid Waste Authority. The description of the Pasco County trash incinerator expansion is accurate.

The new incinerator in Palm Beach County is now ten years old and has a track record worth looking at. In its first decade, it racked up at least 176 incidents (emissions limit exceedances, emissions equipment malfunctions, lost emissions data, and more), and this is likely the tip of the iceberg, as there are thousands of files in Florida DEP's system on it, and this reflects just a fraction of them.[10]

It's also worth noting that if a new 4,000 ton/day trash incinerator were built in Miami-Dade County, using the emissions profile of the new facility in Palm Beach County, but with 40% lower emissions on two pollutants that draft new federal regulations would require to be lowered, this new incinerator would be one of the largest industrial air polluters in Miami-Dade County. It would rank #1 in air emissions of ammonia, cadmium, dioxins/furans, hydrochloric acid, and sulfur dioxide, #3 in greenhouse gases and mercury, #4 in nitrogen oxides, #7 in lead and particulate matter, and #9 in carbon monoxide. Dioxins and furans are the most toxic chemicals

[6] https://ecoprog.com/publications/data-wte
[7] https://wte.org
[8] https://www.cewep.eu/waste-to-energy-plants-in-europe-in-2022/
[9] The Warsaw incinerator uses selective non-catalytic reduction (SNCR) for NOx control instead of the modern selective catalytic reduction (SCR) which is far more effective. https://www.doosanlentjes.com/download/pdf/wte/warsaw.pdf
[10] Ewall, Mike, "Operating Track Record of the 'Cleanest and Greenest' Trash Incinerator in the United States – A Critical Review of Select Air Permitting files from Florida Department of Environmental Protection on Palm Beach Renewable Energy Facility 2 in West Palm Beach, Florida," Jan. 2025. https://www.energyjustice.net/fl/wpb2history.pdf

known to science. This proposed incinerator would become responsible for 73% of the dioxin and furan emissions from industry in the county.[11]

COUNTY'S CLAIM:

Who ensures that waste-to-energy is a safe method of waste management?

In Miami-Dade County, the safety and regulation of waste-to-energy facilities are overseen by several agencies.

- The Florida Department of Environmental Protection (FDEP) is responsible for enforcing environmental regulations and permitting waste-to-energy operations.
- DSWM manages waste disposal and recycling efforts, ensuring compliance with local standards.
- The U.S. EPA also plays a role by setting national standards for emissions and waste management practices.

Together, these agencies ensure that waste-to-energy facilities operate safely and meet regulatory requirements.

FACT: Trash incineration is not a safe method of waste management, nor is it properly regulated.

Trash incineration releases large quantities of toxic chemicals – and for many of them, there is no safe dose. Trash incinerators are typically among the largest industrial air polluters in any county, and Miami-Dade County is no exception. The largest industrial air polluters in the county include Titan Cement (a cement kiln that burns waste), the old county trash incinerator that burned down in 2023, and – if built – the new 4,000 ton/day incinerator (if meeting new standards as the cleanest trash incinerator in the nation) would still be among the county's top air pollution sources.[12]

Meeting regulatory requirements does not equate to being "safe." The U.S. EPA does not directly regulate incinerators. Florida DEP does the permitting and enforcement in place of EPA, based on EPA standards. The county Department of Solid Waste Management (DSWM) does not play a role in emissions from incineration and the county's answer is rather vague on how DSWM is helping make incineration "safe."

There are many misconceptions about air pollution regulation. Smokestack industries paint a certain narrative. They claim that they use continuous emissions monitors to measure their pollution and that the state regulatory agencies get this data. They claim that the state

[11] Ewall, Mike, "Quantitative Analysis of Projected Emissions from Proposed Miami-Dade County Trash Incinerator – An Evaluation of Miami-Dade County's Claims that a New 4,000 Ton/Day Mass Burn Incinerator will Result in No Unacceptable Pollution Impacts," Jan. 2025. https://www.energyjustice.net/fl/mdcincin.pdf

[12] Ewall, Mike, "Quantitative Analysis of Projected Emissions from Proposed Miami-Dade County Trash Incinerator – An Evaluation of Miami-Dade County's Claims that a New 4,000 Ton/Day Mass Burn Incinerator will Result in No Unacceptable Pollution Impacts," Jan. 2025. https://www.energyjustice.net/fl/mdcincin.pdf

regulatory agencies subject them to strict standards and would fine them heavily if they exceed a permit limit. They also claim that they are continually well within their permit limits and that staying within permit limits mean that they're safe and clean and do not cause any harm to public health or the environment.

In order to have a protective air pollution regulatory system, the following are needed:

- Strong, protective standards
- Continuous emissions monitoring
- Aggressive enforcement

In Florida, and throughout the U.S., all three links in this chain are broken, making the industry narrative misleading.

Incinerators are not always within permit limits. Violations in the industry are not unusual. Some incinerators are known to provide a check every quarter to the state environmental agency when they submit their quarterly reports of their continuous emissions monitoring data, paying for the violations they've had in that quarter. It is the cost of doing business.

Enforcement is lax and fines are not sufficient to change behavior. State enforcement agencies are notoriously lax and understaffed, and when notices of violation are issued, they're often accompanied by zero fines, or fine amounts are allowed to be negotiated down. Imagine being stopped for speeding and telling the officer that you think you should pay $30, not $150 for a ticket. This actually happens with incinerators and other industrial facilities are issued proposed fines for violations, and agencies allow fines to be negotiated down.

Fines are rarely significant enough to change profitable behaviors. Even "large" fines can amount to just a few days of tipping fee revenue, and are insufficient to cause an incinerator owner to invest in needed boiler upgrades or more protective emissions controls, which are more costly than habitually paying fines. Some states even limit the amount of fines under old laws that ensure that fines are just an annoyance to be budgeted for – a "cost of doing business," rather than a deterrent.[13]

Emissions limits are not strict. State environmental agencies issue air permits with emissions limits for about a dozen select pollutants (not all pollutants). State agencies (and local governments) are empowered by the federal Clean Air Act to adopt more protective standards than the federal minimums.[14] This rarely happens, though, as state agencies and permit limits

[13] For example, in October 2020, the Covanta Plymouth Renewable Energy trash incinerator in Montgomery County, Pennsylvania was fined $218,393 for violations relating to operational problems causing loud noise and burning plastic and electrical fire smells in the community that have been recurring for over three years now. That amount was considered to be a large fine, but amounted to about three days of Covanta's tipping fee revenues, and failed to stop the recurring problems that continue to this day.

[14] The Clean Air Act, at 42 U.S.C. § 7416, states: "Retention of State authority – Except as otherwise provided in sections 119(c), (e), and (f) (as in effect before the date of the enactment of the Clean Air Act Amendments of 1977), 209, 211(c)(4), and 233 (preempting certain State regulation of moving sources) **nothing in this Act shall preclude or deny the right of any State or**

are typically set to the minimum standards in federal regulations. The federal regulations for large municipal waste combustors[15] were last adopted in 2006 and are required by federal law to be updated every five years. However, EPA had to be sued in federal court to enforce this requirement, and finally proposed a new rule in January 2024. That rule was to be finalized by December 2024, but that deadline was extended to December 2025 with the reopening of a comment period. It is unclear whether the rule will be finalized and implemented under the Trump administration. When EPA first proposed these overdue new regulations, during a presentation in early 2023, the agency suggested low, medium, and high levels of emissions reductions for nine pollutants. When EPA's draft rule came out, it became clear that EPA chose the weakest of the three options for eight of the nine regulated pollutants, and the middle option for nitrogen oxides.

Permit limits are not based on health and safety, but are technology-based. Permitted emission limits set by state environmental agencies are not based on health and safety. Arguments that complying with permit limits equates to "no harm to health and the environment" are a fallacy. As some state environmental regulators have admitted, permit limits are technology-based standards, and do not ensure that there will be no harm to public health.[16] Many permit limits also factor in the cost to a facility, allowing companies to choose cheaper control technologies if more protective ones are deemed too expensive.[17]

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political subdivision thereof to adopt or enforce (1) any standard or limitation respecting emissions of air pollutants or (2) any requirement respecting control or abatement of air pollution; except that if an emission standard or limitation is in effect under an applicable implementation plan or under section 111 or 112, such State or political subdivision may not adopt or enforce any emission standard or limitation which is less stringent than the standard or limitation under such plan or section."

[15] Large Municipal Waste Combustors are trash incinerators where each burner can burn more than 250 tons/day – a size which pertains to all of the incinerators discussed here. See: https://www.epa.gov/stationary-sources-air-pollution/large-municipal-waste-combustors-lmwc-new-source-performance

[16] 8/28/2007 Pennsylvania Department of Environmental Protection public hearing on BioNol's proposed natural gas-powered ethanol biorefinery in Clearfield, Pennsylvania. youtu.be/HQtYjEJq4wI When questioned about why residents were told that the proposed air pollution permit means that the facility would be healthy and safe for the community, while permit limits were six times different at a same-sized second ethanol biorefinery proposed eight miles away in Curwensville (but powered by waste coal, not natural gas). DEP's engineer stated: "The quick answer is that our evaluation is based on technology standards, not health standards… The underlying concept around the country is technology based. What is says essentially is that as older plants and older sources fall apart and become useless and are replaced, they need to be replaced with things that are cleaner. …We don't make evaluations of permits based on health standards in a direct fashion. …For some of the large, very large permits like that one [a waste coal burning power plant], there are direct analysis of health issues. In this case, there is none. Typically, for smaller cases like this one, there isn't any. …Are we looking at the cumulative impacts [of multiple large pollution sources] … the answer is 'no.'"

[17] The federal Clean Air Act has several standards that apply, nearly all of which allow for cost considerations. Sections 108-109 set National Ambient Air Quality Standards (NAAQS) for which states must adopt State Implementation Plans to reduce certain pollutants. In areas considered to be in attainment with NAAQS for criterial air pollutants (nitrogen oxides, sulfur dioxide, carbon monoxide, particulate matter, ozone precursors such as volatile organic compounds, and lead), a facility must meet Reasonably Available Control Technology (RACT) standards, where economic feasibility is a factor, and more expensive technology can be ruled out. This is the standard that was recently applied when MDE set the new limit for nitrogen oxide emissions that required no further action by Covanta. In "non-attainment" (unacceptably polluted) areas, the Lowest Achievable Emissions Rate (LAER) standard is applied for that specific pollutant. LAER *does not* consider cost, but allows for a facility to buy offsets (a right to pollute) from polluters in other areas that have closed or reduced their pollution. Section 111 of the Clean Air Act sets New Source Performance Standards for nine pollutants: particulate matter, carbon monoxide, dioxins/furans, sulfur dioxide, nitrogen oxides, hydrogen chloride, lead, mercury, and cadmium. For these, EPA must look at what is maximally achievable to reduce emissions rates, but must also assess the financial implications and must avoid a mandate that would cause "serious economic disruption in the industry." Section 112 of the Clean Air Act sets National Emissions Standards for Hazardous Air Pollutants (NESHAPS), for which cost is not to be considered.

Bigger plants are permitted to be dirtier because permit limits are concentration-based. Air pollution permits are written in such a way that allowed emissions are in units such as parts *per* million (ppm) or micrograms *per* dry standard cubic meter (µg/dscm). It's always "per" something, representing the concentration of a pollutant in a certain volume of air. This design means that a 1,000 ton/day trash incinerator would be allowed to emit a certain amount of a pollutant, but a 4,000 ton/day trash incinerator is allowed to emit four times as much. Regulations also allow incinerators to comply by showing a certain percentage reduction for certain pollutants as an alternative way to meet a limit. In other words, an incinerator can be violating a concentration-based limit, but if the amount going into the pollution control device is so high that they achieve a certain percentage reduction, then they are still deemed to be in compliance.

Emissions monitoring is not always honest. There's the possibility that Covanta's emissions data is not honest. Both annual stack tests and continuous emissions monitors have been rigged at trash incinerators, by Covanta and others, but are rarely caught. In Connecticut, Covanta was fined $20,000 in a civil action filed by the state Attorney General in response to an employee adjusting a continuous emissions monitoring device to alter a reading in order to pass a continuous emissions monitoring audit.[18] In Tulsa, Oklahoma, Covanta was the target of a criminal investigation by the U.S. Attorney's Office "related to alleged improprieties in the recording and reporting of emissions data" in which Covanta entered into a non-prosecution agreement to follow applicable laws and regulations and pay a $200,000 "community service payment" to the state environmental agency.[19] At other incinerators, including some run by Covanta, the operator has stockpiled cleaner-burning materials like cardboard to use on its annual stack testing day, to make it seem as if their emissions are cleaner year-round.

There is no safe dose of several chemicals released by incinerators. Some chemicals known to be released by incinerators have no safe dose. This includes dioxins,[20] lead,[21] mercury,[22] and particulate matter.[23]

Only a few chemicals are monitored continuously (none of the toxic ones), and only about ten others are tested at all (typically once per year). Only three pollutants are monitored on a continuous basis at most trash incinerators: nitrogen oxides (NOx), sulfur dioxide (SO_2), and carbon monoxide (CO). Some larger incinerators will also continuously monitor carbon dioxide

[18] See page 37 for this 1993 incident reported in this 93-page compilation of Covanta's U.S. violations through September 2006: www.energyjustice.net/files/incineration/covanta/violations2006.pdf

[19] Covanta Holding Corporation's 2019 10-K Securities and Exchange Commission filing, p. 105. (see "Tulsa Matter" describing the consequences of this 2013 incident) d18rn0p25nwr6d.cloudfront.net/CIK-0000225648/992dfb7f-398d-4b17-8e33-75e956f6f235.pdf

[20] "No evidence of dioxin cancer threshold," *Environmental Health Perspectives* 2003 Jul; 111(9): 1145–1147. www.ncbi.nlm.nih.gov/pmc/articles/PMC1241565/

[21] "Lead in the environment: No safe dose," Harvard University excerpt of *The Lancet* (Sept. 11, 2010). www.hsph.harvard.edu/news/multimedia-article/lead/

[22] "Mercury Exposure and Children's Health," *Current Problems in Pediatric and Adolescent Health Care*, 2010 September; 40(8): 186–215. www.ncbi.nlm.nih.gov/pmc/articles/PMC3096006/

[23] World Health Organization, "Ambient (outdoor) air pollution," May 2, 2018. www.who.int/news-room/fact-sheets/detail/ambient-(outdoor)-air-quality-and-health

(CO_2). Some parameters are also continuously monitored, like temperature, oxygen, and opacity (darkness of emissions). In rare cases, additional pollutants are monitored on a continuous basis, such as the six trash incinerators in Pennsylvania having to continuously monitor their hydrochloric acid emissions. Other pollutants, if monitored at all, are typically tested once per year, and sometimes less frequently. These other pollutants that are typically tested once per year in an annual stack test are ammonia, dioxins/furans, hydrochloric acid, particulate matter, mercury, lead, and cadmium.

In the case of dioxins and furans, the most toxic chemicals known to science, federal regulations allow just one burner to be tested each year, so an incinerator with three burners (like Palm Beach Renewable Energy Facility 2 or Wheelabrator South Broward) test each burner once every three years, rotating which burner they test each year.

To illustrate, if speeding motorists were regulated the way most industrial air pollutants are, it would be akin to enforcing a speed limit by allowing drivers to drive all year with no speedometer. Once a year, a speed trap would be set on the highway with signs warning "slow down... speed trap ahead," and the driver's designee would be running the speed trap (companies choose who they pay to conduct the test).

The technology exists to continuously monitor over 50 pollutants from incinerators[24], but this is not required by state or federal regulations, so it is rare than an incinerator monitors any of the toxic chemicals on a continuous basis.

Failure to continuously monitor these more dangerous chemicals means that testing is only done during optimal operating conditions, as testing is not allowed to be conducted during startup, shutdown, or malfunction times, when emissions are known to be higher.

Testing emissions just once per year can greatly understate actual emissions. At the nation's largest waste incinerator, Reworld (Covanta) Delaware Valley in the City of Chester, Pennsylvania, continuous emissions monitoring of hydrochloric acid emissions shows that actual emissions are 62% higher than their annual stack tests indicate.

Dioxin and furan emissions are an even more stark example. One study out of Europe documented that using continuous sampling for dioxins at incinerators revealed the actual emissions to be 32-52 times higher than we think they are in the U.S. when requiring incinerators to test each unit just once every one to four years under ideal operating conditions.[25] A more recent study found that failure to use continuous sampling technology is underestimating dioxin emissions by 460 to 1,290 times.[26]

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[24] "Continuous Emissions Monitors (CEMs)." https://www.ejnet.org/toxics/cems/

[25] De Fré R, Wevers M. "Underestimation in dioxin emission inventories," Organohalogen Compounds, 36: 17–20. www.ejnet.org/toxics/cems/1998_DeFre_OrgComp98_Underest_Dioxin_Em_Inv_Amesa.pdf

[26] Arkenbout, A, Olie K, Esbensen, KH. "Emission regimes of POPs of a Dutch incinerator: regulated, measured and hidden issues." docs.wixstatic.com/ugd/8b2c54_8842250015574805aeb13a18479226fc.pdf

In 2023, the Oregon state legislature passed a law (SB 488) requiring the state's only trash incinerator, also a Covanta plant, to continuously monitor nine toxic metals and to continuously sample dioxins/furans and PCBs.[27] After many delays, legal threats, and winning an exemption from the legally required dioxin/furan and PCB monitoring, Covanta announced that they'll be closing their incinerator by December 31, 2024 – just before they'd have to start continuously monitoring for their toxic metal emissions.[28] The company then changed their mind and filed a legal challenge to the monitoring law while also getting legislation introduced seeking to repeal the law in the 2025 legislative session.

Covanta lobbied against Oregon's SB 488, and against a similar bill in the Hawaii state legislature in 2024.[29] Covanta is the nation's largest waste incineration corporation, and operates 33 of the 63 remaining trash incinerators still operating as of January 1, 2025 (after closing both of their California incinerators in 2024). The aggressive effort to avoid continuous monitoring at their Oregon incinerator raises questions of whether the company is concerned about what results from continuous monitoring at any single facility would reveal about underestimated emissions across their entire fleet.

COUNTY'S CLAIM:

Is waste-to-energy the number one generator of Mercury?

The Environmental Protection Agency (EPA) classifies emissions either as point source or non-point source emissions. Point source emissions are emissions that can be attributed to a specific location or facility while non-point source emissions originate from varying diffuse sources.

The EPA's National Emissions Inventory (NEI) tracks both point source and non-point source mercury emissions throughout the country. In the state of Florida, cremation is the number one source of non-point source mercury emissions: waste-to-energy accounts for 13% of non-point source mercury emissions. Industry-related activities (gypsum manufacturing, cement manufacturing, and steel manufacturing) are the largest emitters of point source mercury emissions while waste-to-energy accounts for 15% of point source mercury emissions.

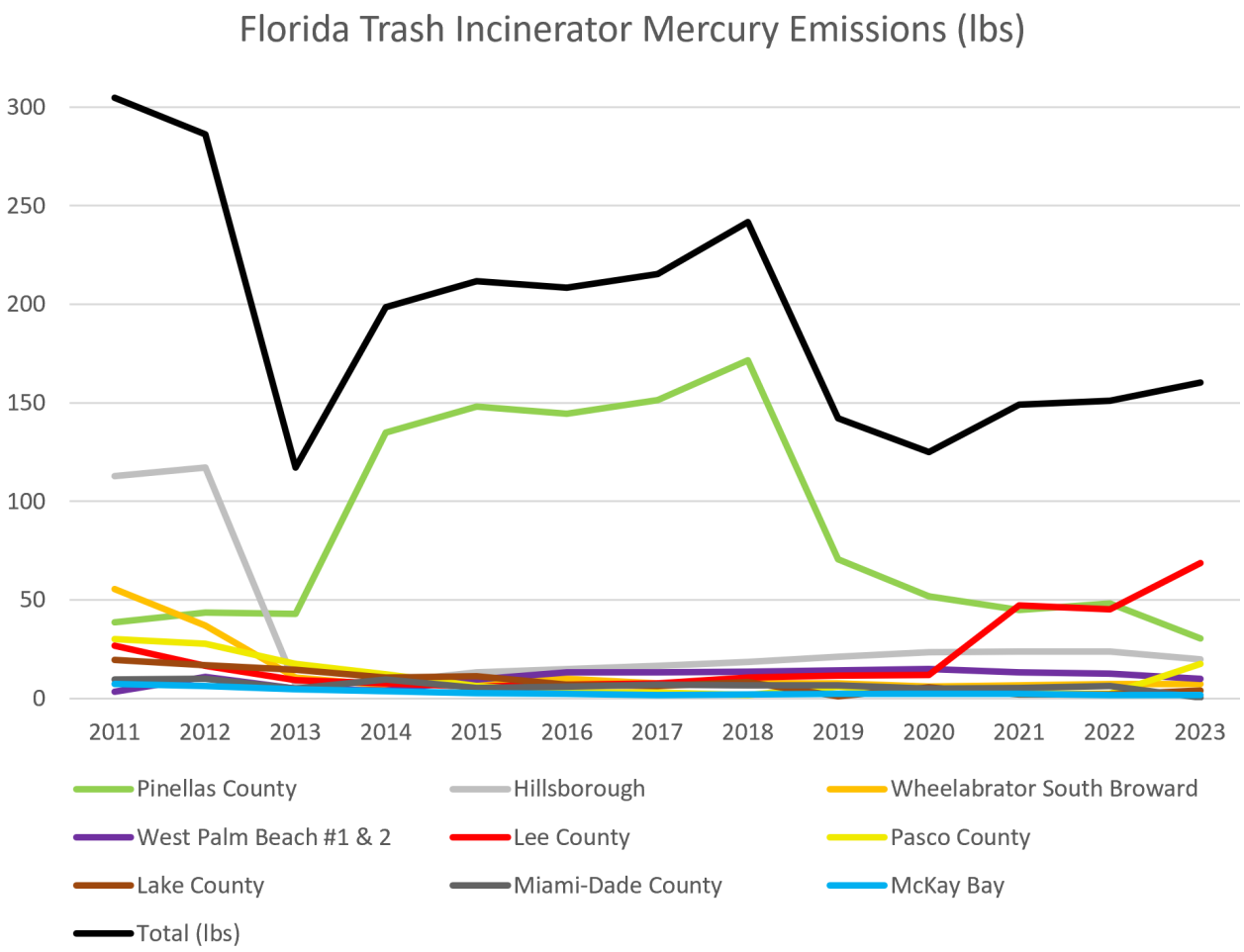
The County is designing the waste-to-energy facility to the EPA's proposed MACT standards, which will result in 88% fewer mercury emissions than plants built to current standards.

FACT: EPA's National Emissions Inventory comes out once every three years.[30] The latest data available is from 2020, as 2023 data is not due out until 3/31/2026.[31] Mercury emissions from

[27] Oregon SB 488 of 2023. https://olis.oregonlegislature.gov/liz/2023R1/Downloads/MeasureDocument/SB488
[28] Beyond Toxics, "Reworld Waste Incinerator Announces Closure," Oct. 11, 2024. https://www.beyondtoxics.org/wp-content/uploads/2024/10/BeyondToxics_PressRelease_Reworld-announces-closure_10-11-24.pdf
[29] Hawai'i SB 2101 SD1 of 2024. https://www.capitol.hawaii.gov/session/measure_indiv.aspx?billtype=SB&billnumber=2101&year=2024
[30] https://www.epa.gov/air-emissions-inventories/national-emissions-inventory-nei
[31] https://www.epa.gov/system/files/documents/2023-05/2023_NEI_Plan_draft_May2023.pdf#page=6

Florida's trash incinerators in 2020 were the lowest in a decade and make for a more favorable comparison than looking at a more complete history as available from Florida DEP.

Data is available from Florida DEP from 2011 through 2023. Almost half of the mercury emissions from Florida's trash incinerators over this time were from the Pinellas County incinerator as indicated in the following chart:



It is true that, in Florida, human crematories are the number one source of non-point source mercury emissions. They are estimated in 2020 to be 45% of non-point sources and are 23% of the total mercury emitted from point and non-point sources in the state. 69% of people in Florida get cremated and much of this mercury is released from "silver" mercury amalgam dental fillings when they are not removed prior to cremation.[32]

In Miami-Dade County, it is estimated that 46 pounds of mercury were released from crematories in 2020 while the waste-burning Titan cement kiln in Medley released 51 pounds, the old county trash incinerator in Doral released 5 pounds that year (but averaged close to 7

[32] https://www.epa.gov/system/files/documents/2023-04/NEI2020_TSD_Section29_Cremation.pdf#page=7

pounds per year from 2011 through 2022). A new 4,000 ton/day incinerator in the county would release 11 pounds per year if emitting mercury at the same rate as the new incinerator in Palm Beach County.[33]

The county website is incorrect where it states that incinerators account for 13% of non-point source mercury emissions in the state in 2020. Incinerators are considered point sources and are not counted in the non-point data. Whoever wrote the text for the county webpage is likely counting breakage at landfills of fluorescent bulbs (which contain mercury vapor) or open burning of household waste, each of which make up 13% of 2020 non-point mercury emissions in Florida.

It is true that, state-wide, gypsum, cement and steel are the largest point sources of mercury and that trash incinerators in the state make up 15% of the mercury emissions from point sources. Within Miami-Dade County, the cement industry (including the Titan cement plant that burns waste) tops the list. Trash incinerators rank 5th in both the state-wide data, and in the county if the projected emissions from a new 4,000 ton/day incinerator were operating as shown with the EPA National Emissions Inventory data summarized below:

Florida Mercury Sources (Top 5)	**Pounds of Mercury (2020)**	**Facility Type**	**%**
Human Crematories	428	Nonpoint	23%
Gypsum Product Manufacturing	245	Point	13%
Cement Manufacturing	201	Point	11%
Steel Mill	141	Point	8%
Trash Incinerators	**137**	**Point**	**7%**

Miami-Dade County Mercury Sources (Top 5)	**Pounds of Mercury (2020)**	**Facility Type**	**%**
Cement Manufacturing	81	Point	41%
Human Crematories	46	Nonpoint	23%
Waste Disposal: Shredding	27	Nonpoint	14%
Lamp Breakage (Landfill emissions)	15	Nonpoint	8%
New Trash Incinerator	**11**	**Point**	**5%**

A look at the specific point sources of mercury in Miami-Dade County shows that the waste-burning cement kiln, Titan's plant in Medley, is responsible for most of the emissions, and that a new incinerator would rank 3rd among the county's largest industrial sources of mercury pollution.

[33] Ewall, Mike, "Quantitative Analysis of Projected Emissions from Proposed Miami-Dade County Trash Incinerator – An Evaluation of Miami-Dade County's Claims that a New 4,000 Ton/Day Mass Burn Incinerator will Result in No Unacceptable Pollution Impacts," Jan. 2025. https://www.energyjustice.net/fl/mdcincin.pdf

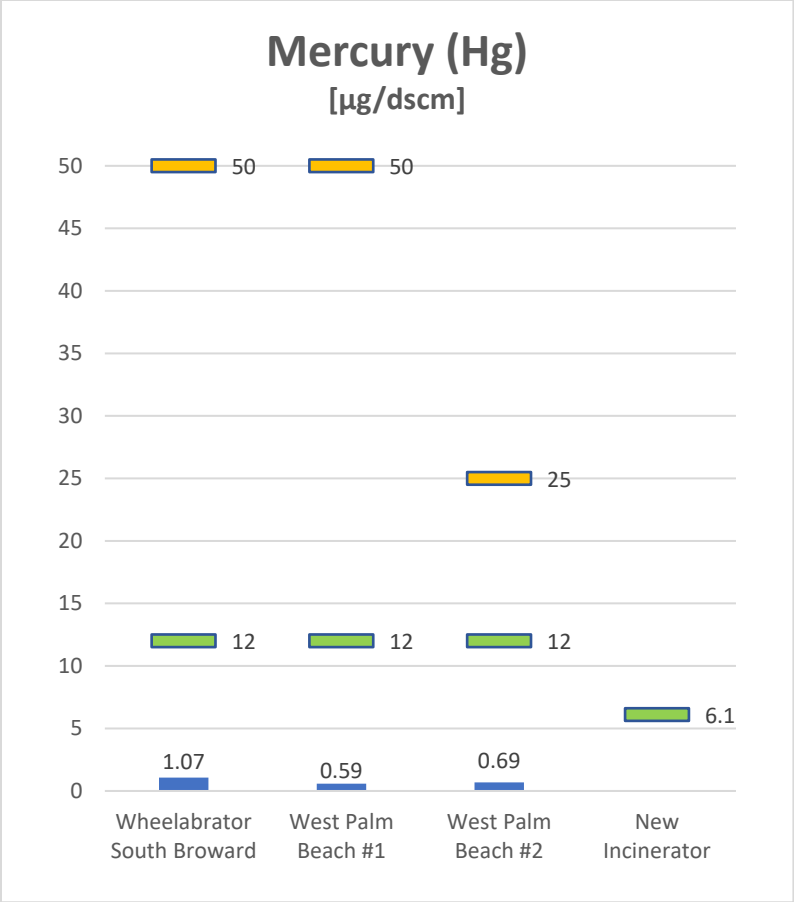
Mercury (lbs)		
51	Titan Florida LLC	Waste burning cement kiln
30	Cemex Construction Materials FL. LLC.	Cement kiln
11	**Proposed 4,000 ton/day Trash Incinerator**	Incinerator
8	NUSFC, LLC	Iron Foundry
5	**Covanta Dade 2,592 ton/day Trash Incinerator [closed]**	Incinerator
0.040795	58th St Landfill (Main County LF)	Landfill
0.016549	South Florida Water Management District	Administration of Water Resources
0.008000	Asahi Refining Florida, Inc. - Miami Gardens	Secondary Smelting / Refining
0.003719	CSX Transportation - Hialeah	Rail Yard
0.001577	Miami-Dade Water and Sewer Department - 3869 Rickenbacker Causeway	Sewage Treatment Plant
0.000505	Turkey Point Power Plant (Florida Power & Light)	1,224 MW gas fired power plant
0.000066	Miami-Dade Water and Sewer Department - 1100 W 2nd Ave	Water Supply and Irrigation Systems
0.000020	WM - Medley Landfill	Landfill
0.000009	Miami-Dade Water and Sewer Department - 6800 SW 87th Ave	Sewage Treatment Plant
0.000002	Flowers Baking Company of Miami, LLC	Bakery
0.000002	Miami-Dade Water and Sewer Department - 2575 NE 156th St	Sewage Treatment Plant

It is true that a new trash incinerator would likely be subject to a mercury emissions limit that is 88% below the current standard. The current federal standards are still from 2006, even though they were supposed to be updated every five years and are not due out until December 2025. The current standard is 50 micrograms per dry standard cubic meter (µg/dscm). The new regulations for large municipal waste combustors (trash incinerators), if the January 2024 draft regulations are adopted, would require 6.1 µg/dscm, which is 88% lower.

However, what matters are not the current or proposed limits, which are set far higher than the actual amounts of mercury released. A new Miami-Dade County incinerator modeled on the ten-year old new incinerator in Palm Beach County would release a projected 11 pounds of mercury per year if releasing mercury at the same rate (0.69 µg/dscm).

As the following chart shows, the emissions limits are set so far above actual emissions rates that lowering the weak 2006 standard by 88% does nothing to reduce the industry's emissions.

The actual emissions from the three existing incinerators in Broward and Palm Beach Counties are in blue. The yellow/orange lines are the current permit limits at each incinerator. The green lines are what the permit limits would be if the January 2024 draft regulations are finalized. There is no blue bar on the new incinerator because there is no data, not because emissions would be zero.



There is no safe dose of mercury. A highly-cited Minnesota study found that if approximately one gram of mercury (the amount in a single fever thermometer) is deposited to a 20-acre lake each year from the atmosphere, this small amount, over time, can contaminate the fish in that lake to the point where they should not be eaten.[34] 11 pounds of mercury equals 4,990 grams. That means that a new Miami-Dade County trash incinerator would release enough mercury sufficient to keep nearly 5,000 20-acre lakes so contaminated that the fish are not safe to eat.

The Florida Department of Health has over 2,000 fish consumption advisories warning about the safety risk of consuming various species of fish in water bodies in throughout the state. There are warnings in every Florida county.[35] Mercury is the reason for 98.6% of these advisories, and some of the remaining advisories are also due to pollutants released from trash incinerators, such as dioxin, lead, and arsenic.

[34] "One Gram of Mercury Can Contaminate a Twenty Acre Lake: A Clarification of This Commonly Cited Statistic," Summary by Interstate Mercury Education and Reduction Clearinghouse, 2004. www.newmoa.org/prevention/mercury/mercurylake.pdf Based on www.newmoa.org/prevention/topichub/22/where_is_mercury.pdf

[35] Florida Department of Health, "Your Guide to Eating Fish Caught in Florida," June 2021. https://www.floridahealth.gov/programs-and-services/prevention/healthy-weight/nutrition/seafood-consumption/_documents/fish-advisory-big-book.pdf (Find a sortable spreadsheet of these advisories here: https://docs.google.com/spreadsheets/d/1hzavLUUMYpyhNUSWESJbLYFTdwYjgbup1GxYTo50hZI/)

COUNTY'S CLAIM:

Does waste-to-energy generate more CO2 than a coal burning plant?

The U.S. Energy Information Administration (EIA) tracks the emission intensity of varying sources of electricity generation. The EIA states that electricity generated from waste-to-energy facilities emit 91.90 pounds of carbon dioxide per million British thermal unit (BTU). Comparatively, coal emits 211.06 pounds of carbon dioxide per million BTUs, natural gas emits 116.65 pounds of carbon dioxide per million BTU, and gasoline emits 155.77 pounds of carbon dioxide per million BTU. (Source: EIA)

Using the latest and more reliable data available from the U.S. Energy Information Administration (EIA) and the U.S. Environmental Protection Agency (EPA), U.S. trash incinerators in 2023 released an average of 1.72 tons of carbon dioxide (CO_2) equivalent per megawatthour (MWh) of electricity generation. By comparison, coal power plants released 0.96 tons per megawatthour. This equates to incinerators releasing 79% more CO_2 equivalent than coal power plants per unit of energy produced.

No trash incinerator has any technology installed to capture or reduce CO_2, as it is cost prohibitive.[36] The only way that incinerator emissions are made to look less than coal or other fossil fuels is by accounting tricks. Using outdated and misinterpreted climate science, half or more of the CO_2 emissions from trash incineration are erased on the basis that plants and trees regrow, therefore the extra emissions at the smokestack from the burning of "biogenic" materials (like food scraps, yard waste, wood and paper products) are considered to be "carbon neutral." However, no extra plant or tree growth is happening because a trash truck drove the waste to an incinerator instead of a landfill. Since at least 2009, climate scientists have debunked the notion of biomass carbon neutrality. In international climate models, it makes sense not to double count emissions of burned trees if the carbon is already assumed to end up in the atmosphere once forests are cut down. However, when looking at just one sector (waste), where those emissions haven't been counted elsewhere, it is not appropriate to pretend that the real CO2 emissions injected from incinerator smokestacks does not exist.

Read more on the creative accounting used to minimize incinerator climate impacts in Chapter 3 of the Beyond Incineration report.[37]

COUNTY'S CLAIM:

Will waste-to-energy spread PFAS?

Per- and Polyfluoroalkyl substances (PFAS)—commonly known as 'forever chemicals'— have been used in the manufacturing processes of a variety of different materials since the 1940s.

[36] https://techxplore.com/news/2025-02-carbon-capture-renewables.html
[37] https://www.energyjustice.net/md/beyond.pdf#page=43

PFAS do not naturally breakdown in the environment and the conditions in which they are neutralized is still being researched by the EPA and other federal and international agencies. Due to the lack of regulation surrounding PFAS, it is found anywhere from wastewater treatment plants to landfills. PFAS have also been identified in waterways and soils around the globe. Although research is limited, the EPA has indicated that the temperatures and the amount of time waste is exposed to heat within a waste-to-energy facility may be sufficient in neutralizing certain PFAS compounds.

If the county's research were not so limited, they would be aware that, for close to five years now, we have known that incinerating PFAS can spew the chemicals into the air, falling out on downwind communities. In April 2020, researchers at Bennington College in Vermont documented that high temperature burning of PFAS at an aggregate kiln in Cohoes, New York (just six miles north of the state capital, Albany) was causing the PFAS to be building up in the water and soils near the facility.[38] The company operating the kiln, Norlite, typically burns hazardous waste to fuel its process, and had illegally accepted hundreds of tanker cars of aqueous film-forming foam (AFFF), better known as firefighting foam, from the U.S. military. AFFF contains PFAS, and Norlite had burned at least two million pounds of it in 2018 and 2019, all under the nose of a full-time New York Department of Environmental Conservation staffperson who was stationed at the plant as an on-site monitor.

Since this incident, additional research has been done on PFAS burning at hazardous waste incinerators[39,40], sewage sludge incinerators[41] and even municipal solid waste (trash) incinerators. These studies have found that PFAS is not fully destroyed by incineration, and that it can result in shorter-chain PFAS chemicals being spread into the air and also concentrating in the incinerator's toxic ash, which can leash PFAS (and has been found to do so at ash landfills).

Trash incinerators do not operate at the higher temperatures that EPA says are needed to break down PFAS. However, even if they did, any high school chemistry student could tell you that fluorine (one of the elements in PFAS) is an element and cannot be broken down by burning. Every bit of fluorine going into an incinerator comes out… and there are no good options for how it comes out.

Hydrofluoric acid (HF) is highly corrosive and is a major pollutant released by trash incinerators. In the best case scenario of burning fluorinated compounds like PFAS, the fluorine is emitted in the form of HF. When the compounds are not fully broken down, they can be emitted as short-

[38] David Bond, Janey Foley, and Tim Schroeder, "COMMENTARY: Ban all incineration of PFAS in New York," Albany Times Union, May 31, 2020. https://www.bennington.edu/sites/default/files/sources/docs/Bond%2C%20Ban%20Incineration%20of%20AFFF%20%28Times%20Union%202020%29.pdf; see also https://www.bennington.edu/AFFF and https://www.bennington.edu/PFOA

[39] "PFAS soil concentrations surrounding a hazardous waste incinerator in East Liverpool, Ohio, an environmental justice community," Environ Sci Pollut Res Int. 2023 Jun 10;30(33):80643–80654. https://pmc.ncbi.nlm.nih.gov/articles/PMC10510938/

[40] "Rise in PFAS Incineration Puts Spotlight on Air Pollution Risk," Bloomberg Law, Oct. 24, 2024. https://news.bloomberglaw.com/environment-and-energy/rise-in-pfas-incineration-puts-spotlight-on-air-pollution-risk

[41] "Per- and polyfluoroalkyl substances fate and transport at a wastewater treatment plant with a collocated sewage sludge incinerator," Science of The Total Environment, Volume 874, 2023. https://www.sciencedirect.com/science/article/pii/S0048969723009737

chain PFAS, which are highly mobile in water and difficult to capture once they have entered the environment.[42] They can also be emitted as fluorinated dioxins, which studies have shown to be more biologically active than chlorinated or brominated dioxins.[43] Dioxins are the most toxic chemicals known to science.

[42] "Forever Chemicals Persist through Waste Incineration, Researcher Finds," https://phys.org/news/2024-09-chemicals-persist-incineration.html

[43] Fed. Reg. Vol 52, No. 108, June 5, 1987, p.21422. https://www.epa.gov/sites/production/files/2015-08/documents/sun87.pdf