Energy Justice Network

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Testimony before

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Committee on Health and Human Services

Mike Ewall, Esq.
Founder & Director
Energy Justice Network
1434 Elbridge St.
Philadelphia, PA 19149
215-436-9511
mike@energyjustice.net
www.EnergyJustice.net

Tell the Streets Department: No more contracts to burn Philly trash!

Charles Lee, Senior Policy Advisor for EPA's Office of Environmental Justice called it the worst case of environmental racism he's ever seen. He was talking about Chester, PA.

Chester is home to the largest trash incinerator in the nation, burning up to 3,500 tons of trash per day. It's the #1 destination for Philly's trash.

It's also one of the largest air polluters in the region. According to the latest EPA data, the incinerator is the largest air polluter in Chester, and the third largest air polluter in the entire 5-county Philadelphia area. Specifically for the nitrogen oxides (NOx), they're also #3 in the 5-county area.[1]

Philadelphia is right downwind.

Nitrogen oxides (NOx) trigger asthma attacks. Chester's childhood asthma hospitalization rate is three times the state average. We have a serious asthma problem in Philly. Philly is the 4th worst place in the nation for asthma sufferers, according to the Asthma and Allergy Foundation of America.[2] Their Asthma Capitals 2018 report singles out Philadelphia as an example where poverty, poor air quality and lack of access to specialists combine to harm asthma suffers, especially children. The report states that "low-income minority children have some of the highest asthma rates of any group in the U.S."

Asthma is a leading cause of missed school days, missed work and millions of dollars in lost productivity. The report states that asthma is one of the most costly diseases – with an estimated annual cost to society of $82 billion nationally, which would break down to $394 million per year for Philadelphia if the city had an average incidence of asthma. Given the city's ranking as 4th worst in the nation, and as the poorest big city, it's more likely that the city suffers impacts closer to $1.2 billion per year from this one disease. According to the PA Department of Health, children in the City of Chester suffer an asthma hospitalization rate three times the state average.[3] Philadelphia is probably similar, which is why tripling the economic impact to Philadelphia is probably about accurate.

[1] U.S. Environmental Protection Agency, 2014 National Emissions Inventory. www.epa.gov/air-emissions-inventories/2014-national-emissions-inventory-nei-data

[2] Asthma and Allergy Foundation of America, *Asthma Capitals 2018*. www.aafa.org/media/2119/aafa-2018-asthma-capitals-report.pdf

[3] See chart at http://www.ejnet.org/chester/asthma.html Based on 2010 data obtained from PA Department of Health.

Covanta's trash incinerator in Chester has no pollution controls to limit NOx. Most incinerators have these controls, but that plant is missing two of the four pollution control devices common to all incinerators. In fact, an EPA inspector from the Philadelphia regional office once questioned the company on their lack of pollution controls, and was told "it costs a lot of money" and would create "operational issues" – even though the company's other incinerators have these additional pollution controls, and with their incinerator in Chester being the largest in the nation, it's probably the most profitable (especially for lack of pollution controls).[4]

Covanta's NOx emissions are so high that they're equivalent to 57 Nicetown gas power plants. Just Philly's contribution of waste to that incinerator is equivalent to 16 Nicetown gas plants.

Philly's waste contracts:

In 2012, Philadelphia entered into two major waste disposal contracts that expire in the summer of 2019. One is with Covanta, the nation's largest incinerator operator. Covanta operates five of the six trash incinerators in Pennsylvania, and controls most of Philadelphia's trash transfer stations. The other contract is with Waste Management, and was intended to support their new operations in Holmesburg in Northeast Philadelphia where they're turning trash into pellets to market as fuel to be burned in cement kilns or other industrial facilities. Both of these practices are horribly polluting and Philadelphia needs to stop entering contracts for waste to be burned.

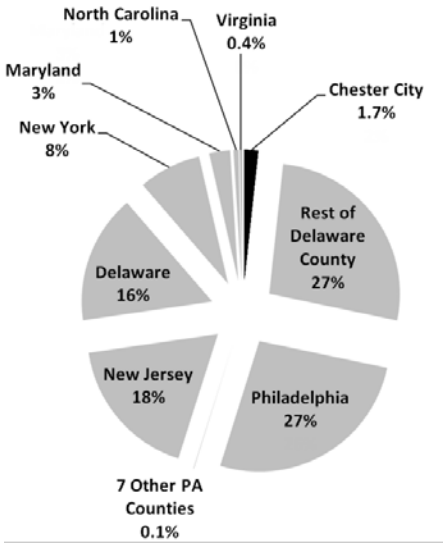
The Streets Department is poised to cut new waste contracts that will determine how Philly's trash is handled for the next 7-10 years or more.

Incineration is the most expensive and polluting way to manage waste. It's more polluting than landfilling. It's also dirtier than coal burning, even at the other incinerators Philly uses which have the full complement of air pollution controls. For every 100 tons burned, 30% becomes toxic ash which still goes to landfills, making them more dangerous. The other 70% becomes air pollution and is essentially landfilling in our lungs. Incineration (and dumping ash in landfills) is worse than directly using landfills and focusing on reducing our waste. See the attached factsheets for more about incineration (and ash dumping) and how it compares to direct use of landfills.

Currently, about 60% of Philly's waste goes straight to landfills, and about 40% goes to incinerators. Over the lifetime of the current contracts (since mid-2012), the amount going to incineration has been 45%.

IS THIS FAIR?

Only 1.7% of the trash burned in Chester is from the City of Chester. As an already overburdened and poor 75% African-American small city, Chester should not bear the burden of the entire region's trash. This is what environmental racism looks like.



As a recipient of federal funds, Philadelphia has a legal obligation under Title VI of the Civil Rights Act to ensure that its decisions (including waste contracting) do not have a disparate impact on racial minorities.

The incinerator in Chester is the largest air polluter in Chester. We also use the incinerator in Plymouth, which is the largest air polluter in Montgomery County. We also use the incinerator in Falls Township, which is the largest air polluter in Bucks County. See the following chart for details:

[4] "Covanta's Chester, PA Trash Incinerator Lacks Basic Pollution Controls," www.ejnet.org/chester/pollutioncontrol.html

How polluting are these trash incinerators?

Incinerator	County	City/Town	Air Pollution Rankings
Covanta Delaware Valley	Delaware	Chester City	Largest air polluter in Chester City, and second only to the PHL airport in Delaware County. Third worst air polluter in the 5-county Philly region. Within Delaware County, their air pollution even surpasses the oil refineries, fossil fuel power plants, chemical plants, a sewage sludge incinerator, and the waste coal-burning Kimberly-Clark paper mill in Chester.
Covanta Plymouth	Montgomery	Plymouth Township	Largest air polluter in Montgomery County, accounting for 19% of all pollution from Montgomery County's 123 industrial air polluters, and more that twice as bad as the second largest polluter.
Wheelabrator Falls	Bucks	Falls Township	Largest air polluter in Bucks County, accounting for 31% of all pollution from Bucks County's 104 industrial air polluters, and more that twice as bad as the second largest polluter.

Within the 5-county Philadelphia area, which contains a large concentration of polluting industry (489 facilities), the Covanta's incinerator in Chester ranks high for many specific pollutants, including being:

- **#2 in Mercury** causes damage to nervous, digestive, and immune systems, lowers IQ in children
  - Covanta Delaware Valley releases about 60 pounds of mercury into the region's air every year
- **#3 in Nitrogen Oxides (NOx)** triggers asthma attacks, increases lifetime risk of chronic respiratory disease and stroke
  - Covanta Delaware Valley releases nearly 2.5 million pounds of NOx into the region's air every year
- **#3 in Sulfur Dioxide** triggers asthma attacks, increases lifetime risk of chronic respiratory and heart diseases and stroke
- **#4 in Cadmium** causes cancer, damages bones and brain function, affects blood pressure and testosterone levels
- **#5 in Carbon Monoxide** causes headaches and dizziness; increases lifetime risk of heart disease
- **#5 in Hydrochloric Acid** irritates eyes, skin, and nose, damages lungs
- **#6 in Greenhouse gases** causes global warming, increases in heat-related deaths, suicide, mosquito-born diseases, and much more
- **#6 in Particulate Matter (PM10 and PM2.5)** aggravates lung disease, triggers asthma attacks, causes acute bronchitis; can cause heart attacks in those with heart disease

Where SHOULD Philly's waste go?

Philadelphia needs to get serious about Zero Waste, and stop pretending that "Zero Waste to Landfill" is a thing (it's not… it's an excuse to burn waste and pretend that toxic ash doesn't go to a landfill, making it worse). Zero Waste is defined as NO incineration and reducing waste to landfill by at least 90%. We're far from that. On our way to Zero Waste, we need to be honest about the fact that no matter what we do, there's a landfill at the end of the picture, but burning waste first is NOT better. It's far more polluting and dangerous.

Pennsylvania has a glut of landfill space, which is being filled up by other states. Ever since it was first measured in the early 1990s, PA has been the largest importer of trash, taking waste from Canada down to Puerto Rico and every state in-between. Just one landfill in Berks County (Conestoga Landfill, which we also use) has five times as much space as we need to stop incinerating waste altogether. It's also conveniently located just off of the PA Turnpike, which is why Philadelphia has used it so much.

City Council will be asked to approve new long-term waste contracts, as well as recycling contracts (which are also a concern now that half of Philly's recyclables are being burned and not recycled!). It's important that City Council step up and refuse to approve contracts for burning our waste.

City Council can and should pass a law that:

1. requires standards for how polluting waste facilities that we contract with can be,
2. prevents the Streets Department from contracting for waste to be burned, directly or indirectly, and
3. requires that the Streets Department (and all city agencies) comply with the Civil Rights Act by ensuring that their policies and practices do not create disparate impacts on racial minorities.

Where Philadelphia's waste has gone during the current contracts (from mid-2012 through the first quarter of 2018):

Incinerators are highlighted in yellow.

Landfill / Incinerator	County	Tons	% Incinerated
COVANTA DELAWARE VALLEY	Delaware	1,912,001	24%
WHEELABRATOR FALLS INC	Bucks	1,360,959	17%
MODERN LANDFILL	York	1,253,083	
G.R.O.W.S. NORTH	Bucks	1,027,550	
CONESTOGA LANDFILL	Berks	690,035	
FAIRLESS LANDFILL	Bucks	674,542	
TULLYTOWN RESOURCE RECOVERY FACILITY	Bucks	517,239	
COVANTA PLYMOUTH RENEWABLE ENERGY	Montgomery	155,869	2%
YORK COUNTY RESOURCE RECOVERY CENTER	York	147,554	2%
DELAWARE COUNTY SWA ROLLING HILLS LANDFILL	Berks	78,311	
PIONEER CROSSING LANDFILL	Berks	16,693	
CUMBERLAND COUNTY LANDFILL	Cumberland	14,496	
COMMONWEALTH ENVIRONMENTAL SYSTEMS LANDFILL	Schuylkill	13,810	
WESTERN BERKS COMMUNITY LANDFILL	Berks	11,529	
LCSWMA - Susq. Resource Mgmt Complex	Dauphin	10,622	0.1%
LCSWMA RESOURCE RECOVERY FACILITY	Lancaster	8,747	0.1%
CHESTER COUNTY SWA LANCHESTER LANDFILL	Chester	7,517	
BETHLEHEM LANDFILL	Northampton	6,515	
ADVANCED DISPOSAL SERVICES GREENTREE LANDFILL LLC.	Elk	5,907	
SOUTHERN ALLEGHENIES LANDFILL INC	Somerset	1,321	
IMPERIAL LANDFILL	Allegheny	1,232	
KEYSTONE SANITARY LANDFILL	Lackawanna	375	
CLINTON COUNTY SWA WAYNE TOWNSHIP LANDFILL	Clinton	310	
Casella McKean County Landfill	McKean	92	
GRAND CENTRAL SANITARY LANDFILL INC	Northampton	1	
TOTAL		**7,916,310**	**45%**

Energy Justice Network

FACT SHEET
Trash Incineration ("Waste-to-Energy")

www.energyjustice.net/incineration/

Incineration 101

Municipal solid waste (trash) **incineration is the most expensive and polluting way to manage waste or to make energy.** Only 11.7% of U.S. trash in the U.S. is incinerated. The rest is recycled, composted or landfilled.

Incineration is a dirty word, and industry knows it, so they use other terms to make it sound good, like resource recovery, trash-to-steam, waste-to-energy and energy from waste. All of these terms are untruthful and misleading. The most aggressive in arguing that they are not incinerators are specific

types of incinerators using technologies known as gasification, pyrolysis and plasma arc. In the U.S. and in the European Union, these technologies are legally defined and regulated as incinerators. They share the same fundamental problems with conventional incinerators, but they operate in two stages, first turning the waste into a gas, then burning it, letting the companies pretend that they aren't actually incinerating (burning) the waste itself.

In reality, incinerators are **waste-OF-energy** facilities. Incinerators destroy resources that are better reused. If the same materials burned in trash incinerators were recycled or composted, they would save 3–5 times more energy than incinerators can make from burning them, since raw materials don't need to be extracted and produced all over again. Most of the energy in materials, like paper, was spent making them, but is not physically present in the paper itself.

Not Renewable

Incineration is not renewable energy. While many state renewable energy laws count it as renewable energy, municipal waste is non-renewable, consisting of discarded materials such as paper, plastic and glass that are derived from finite natural resources such as forests that are being depleted at unsustainable rates. Burning these materials creates a demand for "waste" and discourages much-needed efforts to conserve resources, reduce packaging and waste and encourage recycling and composting.

Environmental Racism

Incinerators are an environmental racism issue. Incinerators for trash, hazardous waste, sewage sludge and other types of waste are typically located in communities of color and low-income communities. At least with hazardous waste facilities, race is more of a factor than class, so it's not just that people of color tend to live in low-income communities. Some are located in relatively affluent communities of color.

Dirtier Than Coal

To make the same amount of energy, burning trash pollutes the air far more than burning coal, even though incinerators are generally newer and have more air pollution controls than coal power plants. Trash incinerators release 28 times as much dioxin air pollution than coal, about six times more lead and mercury, 3.2 times more nitrogen oxides (NO_x), 2.5 times as much carbon dioxide (CO_2), twice as much carbon monoxide (CO) and 20% more sulfur dioxide (SO_2).

Sometimes called "trash-to-steam" plants, incinerators cannot turn trash into mere water vapor, as there are all sorts of elements in waste, not just hydrogen and oxygen to make H_2O (water). Trash contains toxic metals like arsenic, lead and mercury, halogens like chlorine that produce acid gases and ultratoxic dioxins and furans when burned, carbon, sulfur and nitrogen compounds that form some of the above-mentioned pollutants, and much more.

Incinerators are really "trash-to-toxic-ash-and-toxic-air-pollution" facilities. Imagine that you throw an old pen "away" and it goes to a nearby landfill. There are metals in the pen, some of which may be toxic, as well as plastics and inks that may be chlorinated. Buried in a landfill, it will take a very long time before any of those chemicals can reach you in a form that you can breathe or drink. However, if that pen were sent to an incinerator, any toxic materials in the pen are instantly made available for breathing and drinking through a combination of air pollution and the toxic ash produced, which still goes to a landfill, but now can blow around and leach into groundwater more readily. In addition to making toxic elements more available, burning creates new pollutants that weren't there to begin with, including acid gases, NO_x, CO, CO_2, SO_2, dioxins and furans.

Incinerators, like nearly all facilities with smokestacks, do not monitor what they are putting into the air on a day-to-day basis. Permits only tend to require three pollutants — CO, NO_x and SO_2 (none of the toxic ones) — to be monitored on a continuous basis. Several other pollutants are tested once per year; many not at all. Annual testing is like having a speed limit where a speed trap is set just one day a year, there are signs warning "speed trap ahead" and the driver's brother runs the speed trap (the companies do their own testing). In reality, incinerators are "speeding" many other days of the year, with excessive emissions during startup, shutdown and malfunction times, when testing is not done.

Incinerators do not replace landfills, but require smaller, more toxic, landfills for their ash. Any pollutants captured in air pollution controls are added to the ash, so the cleaner the air, the more toxic the ash. Ash is more toxic than unburned trash because new toxins were formed by burning, and since existing toxins are more available. Think of coffee beans vs. coffee grounds. Pour water over beans and you won't get coffee, but grind them up and increase their surface area, pour water over them, and you get coffee. Ash is similar in that its higher surface area means more toxins can leach out, polluting groundwater.

Health Effects

Incinerators are bad for people's health. Studies have found, in communities around incinerators:

- Increases in pre-term babies and babies born with spina bifida or heart defects.
- Increased cancers, especially: larynx, lung, colorectal, liver and stomach cancers, leukemia (blood cancer), childhood cancers, soft-tissue sarcoma and non-Hodgkin's lymphoma.
- Increased dioxins in the blood of incinerator workers.

Most Expensive — Bankruptcies and Bailouts

Studies done for U.S. Energy Information Administration in 2010 and 2013 show that trash incinerators are, by far, the most expensive way to make energy. Even though trash incinerators get paid to take their fuel, they're the most expensive to build and most expensive to operate and maintain – even worse than nuclear and biomass. They're nine times more expensive to build than a conventional natural gas power plant and 30 times more expensive to operate. They even cost about twice as much to build as solar and nearly four times as much as wind.

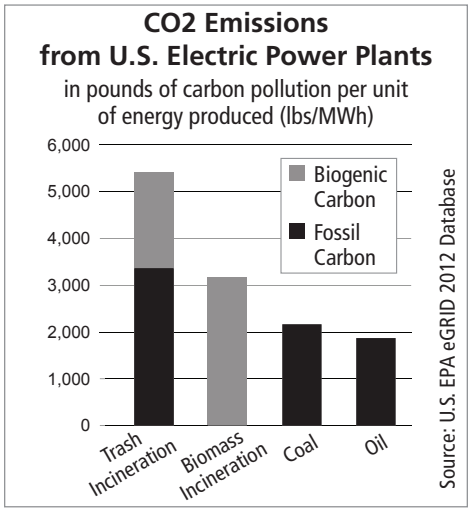
Incineration is also far more expensive than landfilling. It competes only by locating in high-priced waste markets and by locking local and county governments into long-term monopoly contracts, often with "put-or-pay" clauses. Such clauses require that a certain amount of waste be provided to the incinerator, or the governments pay the full amount, even if not providing enough waste. This discourages waste reduction, recycling and composting, because the community can't save money by doing these things. It also allows the incinerator company to fill that extra capacity with waste from other places, getting paid twice for the same capacity.

Expensive incinerators have driven some local governments into bankruptcy. The most spectacular examples have been Harrisburg, Pennsylvania (the largest city bankruptcy at the time, filed in 2011), and Claremont, New Hampshire, where 29 towns filed for bankruptcy due to "put-or-pay" contracts. In other cases, massive bailouts have been necessary, such as the $1.5 billion in state bailouts for New Jersey's five incinerators, and the $1.2 billion in debt payments at the Detroit incinerator, contributing to that city's bankruptcy. In most other cases, the expense of incineration is covered other ways, such as through hidden fees on property tax assessments, by accepting more profitable industrial wastes, and/or by cranking up fees on the captive local community while offering discounted waste disposal to outlying areas to compete with landfills and attract waste to meet capacity.

Incinerators are terrible ways to produce jobs. For every 10,000 tons of waste processed per year, incinerators and landfills create one job, while recycling facilities create 10 jobs and reuse, remanufacturing and repairing materials creates far more (20-300 jobs depending on the material). With a national recycling rate of less than 33%, the U.S. recycling industries currently provide over 800,000 jobs. A national recycling rate of 75% would create 1.5 million jobs.

Competition with Recycling and Clean Energy

Incineration competes with waste reduction, recycling and composting, both through its contracts demanding a certain amount of waste generation, and by virtue of the fact that incinerators need recyclable materials, like paper, tires, wood and plastics, to be able to burn effectively. Within renewable energy policies, incinerators (and landfills that burn their gas for energy) often get subsidized as renewable energy, but recycling and composting do not. Burning trash, "biomass" and landfill gas crowds out wind power in renewable energy mandates.



The "Carbon-Neutral" Myth

While EPA data shows that trash incineration is 2.5 times as bad as coal for global warming (CO_2 pollution per amount of energy produced), the industry pretends that they're carbon negative! They pull off this trick by comparing themselves to methane emissions from landfills, and by not counting the portion of emissions from burning paper and other organic material. Even if you don't count that "biogenic" fraction of what is in waste, the CO_2 emissions from the rest (plastics and such) is still 55% worse than coal. However, the "carbon neutral" myth has been repeatedly busted in recent years, since it takes trees centuries to suck all of the carbon back up, even if trees were replanted and left to grow for that long. It's true that landfills are worse than incinerators for global warming, but this can be avoided by keeping clean compostable organics out of landfills, and by digesting dirty organics before landfilling them, so that their methane can be contained and used for energy in a cleaner way.

It Doesn't Work in Europe

Incinerator pushers like to point across the ocean and claim that incineration works in Europe and Japan, where they rely heavily on incineration. Incinerators in these countries are also very polluting, still compete with recycling, and some European countries have found themselves having to import waste from neighboring countries just to keep their incinerators fed with enough waste to operate.

Real Solutions for Energy and Waste

We can meet all of our electricity needs with conservation, efficiency, wind, solar and energy storage. Sometimes incinerators are used for heating as well, but those needs are best met with conservation, efficiency, geothermal, air-source heat pumps and solar hot water.

The "zero waste" alternative aims to eliminate incinerators and cut use of landfills by at least 90%. Some communities, especially San Francisco, are well on their way. These solutions involve maximizing source reduction, reuse, recycling and composting. For whatever is left, it must be examined to see what failed to get diverted upstream, so products can be redesigned or phased out. Any remainder should go through mechanical and biological treatment before landfilling to get out more recyclables, and digest the remaining waste first, avoiding gassy landfills and their global warming impacts.

Energy Justice Network • Mike Ewall • 215-436-9511 • incineration@energyjustice.net • www.energyjustice.net/incineration/

How does Trash Incineration compare to Landfilling? Coal?

Environmentalists have long understood that, as bad as landfilling is, trash incineration (and landfilling the toxic ash) is even worse. Energy Justice Network claims that trash incineration is the most expensive and polluting way to manage waste or to make energy. Is this really supported by the evidence?

Incineration is more expensive than landfilling. This has been affirmed by local experiences nearly everywhere in the U.S., and by a 2005 national tipping fee survey by the National Solid Waste Management Association (a waste industry trade association). A 2013 statement by the president of the incinerator industry's trade association, the Energy Recovery Council, also stated in public testimony that it's "not in dispute" that trash incineration "compared to a landfill… is more expensive… almost in every case."[1]

Incineration is the most expensive source of energy. The Energy Information Administration has published two studies that compare the costs of incineration to other energy sources. In each case, trash incineration came out as the most expensive to build ***and*** the most expansive to operate and maintain.[2]

Incineration is more polluting than coal. The average coal power plant in the U.S. was built in 1971. The average trash incinerator was built in 1987, and has additional air pollution control devices. Despite these additional controls, a 2011 report by the Environmental Integrity Project compared two trash incinerators in Maryland with four coal power plants in the state, and found that the incinerators emitted mercury, lead, nitrogen oxides (NOx), carbon monoxide (CO), and carbon dioxide (CO_2) at higher rates than coal. Toxic lead emissions were found to be emitted at a rate six times that of coal.[3] Also in 2011, the New York Department of Environmental Conservation published comments objecting to incineration being considered renewable energy in New York, and comparing the emissions from their 10 trash incinerators to their 8 coal power plants. The state's analysis found that incinerators release mercury, lead, cadmium, CO, NOx and hydrochloric acid at higher rates than coal, though emissions of sulfur dioxide (SO_2) were lower than coal. Shockingly, mercury from incineration was found to be emitted at a rate 14 times that of coal.[4] Energy Justice Network 2014 analysis of U.S. EPA data compared 59 trash incinerators to 383 coal power plants and found that, to make the same amount of energy, trash incineration emits 2.5 times as much CO_2, three times as much NOx and 70% more SO_2 than coal. Using the best available industry-wide EPA data, Energy Justice also found that mercury is emitted by trash incinerators at a rate six times that of coal, and that incinerator release dioxins – the most toxic man-made chemicals known to science – at a rate 28 times that of coal.[5]

Of course, trash incinerators are not meant to be power plants, and even the president of the incinerator industry's trade association has admitted that energy generation is a "secondary function," and that they're primarily designed to manage solid waste. *So how do incinerators compare to landfills?*

Incineration is more polluting than landfills. Incinerators do not avoid landfills. For every 100 tons of trash burned, 30 tons become toxic ash that goes to landfills. The other 70 tons don't turn into energy, but become air pollution. In terms of air pollution, and groundwater impacts, burning waste then burying ash is far worse than direct landfilling, and both are worse than a Zero Waste approach.

In a 2017 life cycle analysis conducted to evaluate Washington, DC's waste options, ten different environmental measures were examined when comparing incineration in Lorton, VA to trucking waste to four southeastern Virginia landfills that were 2-4 times as far from DC. On a majority of the 10 environmental measures evaluated, incineration turned out to be worse than landfilling, even counting the extra emissions from diesel trucks hauling waste further to reach landfills. In fact, emissions from trucking were insignificant compared to those from the waste facilities. Incineration proved to be worse than landfills when it comes to global warming pollution, and pollution from nitrogen oxides, particulate matter, toxic chemical releases, acid gases, and smog. On a 7th measure (eutrophication), they were about tied, and on three of the smallest measures of types of chemical releases, landfills proved to be worse.[6]

Too often, major air pollution and health issues (like asthma and cancer), get swept aside when some look only at global warming pollution, where some studies suggest that landfills are worse than incinerators. In fact, landfills *are* bad for global warming, as they emit large amounts of landfill gas as organics like food scraps and yard waste rapidly degrade. Landfill gas is about half carbon dioxide and half methane. Methane was long thought to be just about 20-some times as bad as CO_2 for the climate, but is now understood to be 34 times as bad over a 100-year time span, and a whopping 86 times as bad over a 20-year horizon, which is more relevant for avoiding global warming tipping points. However, even using the latest science on methane and a 20-year time horizon, the evaluation found that trucking waste four times as far to a landfill is still not as bad for the climate than burning closer to home.

Greenhouse gas comparisons that make incineration out to be better than landfills (or coal) rely on some major flawed assumptions.[7] Nearly half of the CO_2 emissions from trash incineration are "biogenic" in that they come from burning food scraps, yard waste, wood, paper, and other products that were grown, as opposed to petroleum-based plastics that produce the other half. While it's been scientifically debunked repeatedly, some still embrace the "carbon neutrality" argument that counts those emissions as zero because new growing plants suck up the carbon.[8] However, the decision to burn or bury has no impact on whether plants will regrow, and it's not valid to discount nearly half of an incinerator's GHG emissions while counting the GHG emissions from landfills, which are entirely "biogenic" (the plastics in landfills aren't forming GHGs). Another major flaw is subtracting emissions from coal power plants as if any energy generation at an incinerator displaces coal. In fact, because of trash incineration being considered renewable energy in many places, it can be more likely to be displacing emission-free wind power. Energy displacement is too speculative to enter into such life cycle analysis, and if it is used, the full benefits of a zero waste system should be included, whereby recycling and composting save 3-5 times more energy than incineration creates by burning those materials that will need to be recreated with more energy. Subtracting avoided methane emissions from landfills is also a dishonest way to do a comparison between incinerators and landfills.

Burning trash creates new toxic chemicals and makes existing toxins in products more available to leach out when rainwater contacts ash in a landfill. Since it's the toxicity (not volume) of waste that harms health, it's better to send stabilized, unburned trash to a landfill than incinerator ash.

There are three major options for how to manage waste, all of which end in landfilling in some way:

1) Landfill directly
2) Incinerate and landfill toxic ash
3) Zero waste with material recovery and biological treatment prior to stabilized landfilling

Studies comparing landfilling and incineration to zero waste approaches have found – not surprisingly – that avoided production (reduction and reuse), recycling and composting are better for the climate than burning or burying materials,[9] and that the "leftovers" are best handled with a material recovery and biological treatment (MRBT) process before landfilling.[10] Material recovery means mechanically removing extra recyclables that are still discarded. Biological treatment means stabilizing any residual organic material with an anaerobic digestion process so that any gas generation is done in an enclosed system where gases can be easily captured, avoiding having a gassy, stinky landfill. Following the Zero Waste Hierarchy provides the best results.[11]

[1] http://www.energyjustice.net/incineration/expensive-waste
[2] http://www.energyjustice.net/incineration/expensive-energy
[3] http://www.environmentalintegrity.org/documents/FINALWTEINCINERATORREPORT-101111.pdf
[4] http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={DEEA097E-A9A6-4E53-898C-0BC2F4C60CC4} See pp.22 & 25.
[5] http://www.energyjustice.net/incineration/worsethancoal
[6] http://www.energyjustice.net/files/incineration/incineration_vs_landfills_DC.pdf See slides 7-11, 15-17, and 25-37.
[7] http://www.energyjustice.net/incineration/climate
[8] http://www.energyjustice.net/biomass/climate
[9] http://www.eunomia.co.uk/reports-tools/the-potential-contribution-of-waste-management-to-a-low-carbon-economy/
[10] http://www.ecocycle.org/specialreports/leftovers
[11] http://zwia.org/standards/zero-waste-hierarchy/

By Mike Ewall, Esq., Energy Justice Network
215-436-9511 | mike@energyjustice.net
www.energyjustice.net April 2018

Philadelphia's Waste Disposal Options

	Demographics within 1 mile			
Facility	**Population**	**% People of Color**	**Medium Household income**	**Dist. from Philly (miles)**
Covanta Delaware Valley Incinerator and ash to Berks County Landfill	3,088	88%	$44,000	19
Bucks County Landfills and Incinerator	0	n/a	n/a	32
Conestoga Landfill (Berks County)	50	0%	$84,000	50
Modern Landfill (York County)	196	7%	$70,000	97

Which is worse?

Criteria	Incineration	Landfilling
Population impacted	X	
Environmental justice	X	
Nitrogen Oxide emissions (asthma)	X	
Particulate Matter emissions	X	
Toxic emissions	X	
Cancer-causing emissions		X
Eutrophication	X	x
Acidification (acid rain…)	X	
Pesticide-like chemicals		X
Ozone depletion		X
Smog formation	X	
Global warming	X	
Jobs	X	
Cost	X	

Sources:

- U.S. Census data made available via justicemap.org
- PA Department of Environmental Protection
- 2017 Life Cycle Assessment on DC's Waste Disposal Options, Jeffrey Morris, Sound Resource Management Group, using data from EPA, EIA, VA DEQ, DC DPW, and Energy Recovery Council

All available from Energy Justice Network: Mike Ewall, 215-436-9511 or mike@energyjustice.net