



www.EnergyJustice.net

...helping communities protect themselves from polluting energy and waste technologies

Trash Incineration



www.EnergyJustice.net/incineration/

Energy Justice Network

Map BETA

Home People ▾ Groups ▾ **Facilities ▾** Events ▾ Resources ▾ About ▾ Login

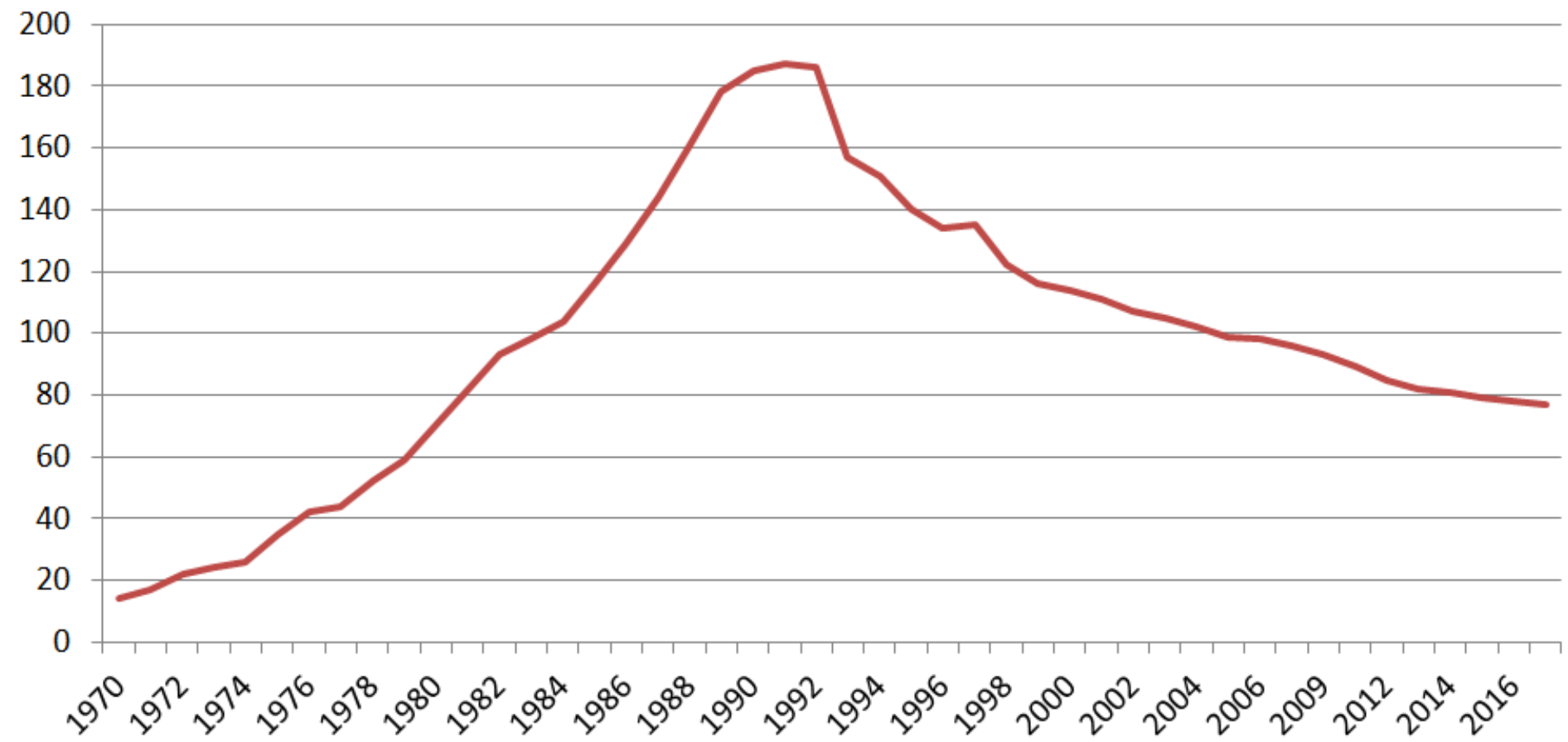
National Map

Address: Go [Save Map](#)   [Save as Image](#) [Advanced Mode](#) [Income & Race Help](#)



www.EnergyJustice.net/map

Number of Commercial Trash Incinerators Operating in the U.S.



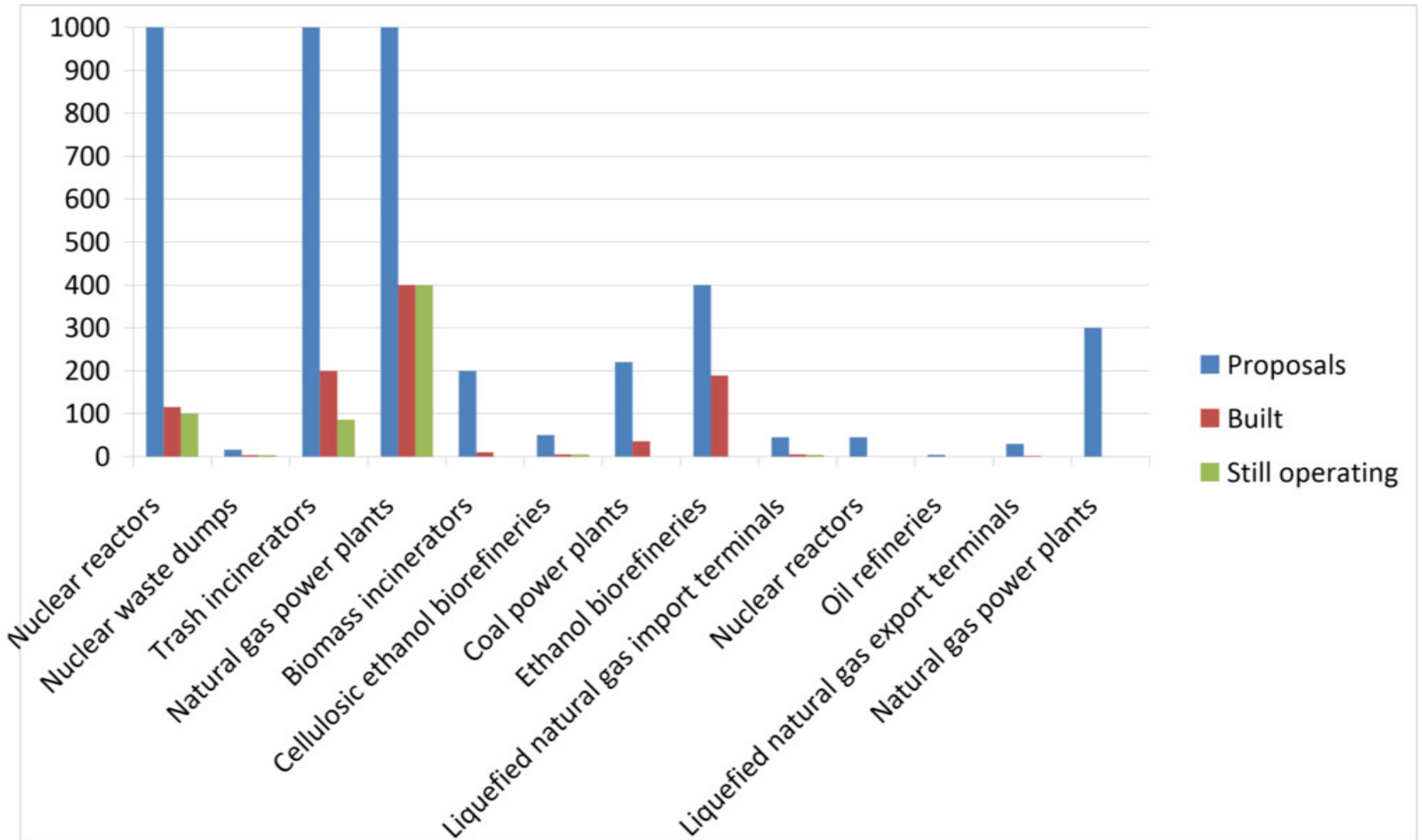
Energy Justice Network

Victories Against Biomass & Waste Incinerators (2010 - 2014)

Victory	City	State	Waste to be burned	Local group
Nov-14	Frederick	Maryland	Trash / Tires / Sewage Sludge	No Incinerator Alliance; Waste Not! Carroll
Oct-14	Bloomington-Normal	Illinois	Trash / Tires	Don't Waste Bloomington-Normal
Sept-14	Allentown	Pennsylvania	Trash / Sewage Sludge	Allentown Residents for Clean Air
Aug-14	Stafford County	Virginia	Trash / Tires	Stop the Stafford Incinerator
Apr-14	Jasper	Indiana	Miscanthus grass	Healthy Dubois County
Apr-14	Port Townsend	Washington	Wood	Port Townsend Airwatchers
Mar-14	North Las Vegas	Nevada	Construction/demolition waste & tires	Citizens of North Las Vegas United
Mar-14	Bristol	Pennsylvania	Hazardous Waste	Ban the Burn in Bristol
Feb-14	North Springfield	Vermont	Wood / Wood Waste	North Springfield Action Group
Feb-14	Minneapolis	Minnesota	Trash (expansion blocked)	Minneapolis Neighbors for Clean Air
Jan-14	White Deer	Pennsylvania	Tires	Tire Burner Team; Organizations United for the Environment / Shale Justice
Jul-13	Transylvania County	North Carolina	Trash / Wood Waste	People for Clean Mountains
Jun-13	Klamath Falls	Oregon	Wood / Wood Waste	Save Our Rural Oregon
Apr-13	Greenfield	Massachusetts	Wood / Wood Waste	Concerned Citizens of Franklin County
Jan-13	Peters Township	Pennsylvania	Crematorium	Peters Township residents
Jul-12	St. Lucie	Florida	Trash	Floridians Against Incinerators in Disguise
Apr-12	Biscoe	North Carolina	Poultry Waste	Blue Ridge Environmental Defense League
Feb-12	Montgomery County	North Carolina	Poultry Waste	Blue Ridge Environmental Defense League
Jan-12	Pichidegua	Chile	Poultry Waste	Comite en defensa del medio ambiente de Pichidegua
Nov-11	Port St. Joe	Florida	Wood / Wood Waste	Gulf Citizens for Renewable Energy
Nov-11	Vancouver	Washington	Wood / Wood Waste	Clark County Clean Air
Oct-11	Milltown	Indiana	Wood / Wood Waste	Concerned Citizens of Crawford County
Jun-11	Hamilton County	Florida	Wood / Wood Waste	Floridians Against Incinerators in Disguise
Jun-11	Valdosta	Georgia	Sewage Sludge / Wood Waste	Valdosta-Lowndes NAACP; Wiregrass Activists for a Clean Environment
May-11	Springfield	Massachusetts	Construction / demolition wood waste	Stop Toxic Incineration in Springfield
May-11	Mecklenburg County	North Carolina	Trash	Central Piedmont Sierra Club; SustainCharlotte
May-11	Attleboro	Massachusetts	Railroad Ties, Utility Poles & Plastics	Attleboro Residents with Important Safety Concerns
Apr-11	Pownal	Vermont	Wood / Wood Waste	Bennington-Berkshire Citizens Coalition
Mar-11	Shelton	Washington	Wood / Wood Waste	Concerned Citizens of Mason County
Mar-11	DeKalb County	Georgia	Wood / Wood Waste	Lithonia residents; Unhappy Taxpayer Voter Association
Feb-11	Somerset	Massachusetts	Coal / Wood Waste	Toxics Action Center; Somerset residents
Dec-10	Olympia	Washington	Wood / Wood Waste	Olympia Rising Tide; No Biomass Burn
Dec-10	Salem	Missouri	Wood / Wood Waste	Concerned Citizens of Perryville
Dec-10	Elbert County	Georgia	Trash / Wood Waste	Citizens for Public Awareness
Nov-10	Shadyside	Ohio	Coal-to-Biomass Conversion	Buckeye Forest Council
Nov-10	Clackamas County	Oregon	Wood / Wood Waste	Redland Community Action Group
Aug-10	Hart County	Georgia	Poultry Waste	Stop Fibrowatt in Northeast Georgia
Aug-10	Sampson County	North Carolina	Poultry Waste	Sampson Citizens for a Safe Environment; NAACP
Jul-10	Scottsburg	Indiana	Wood / Wood Waste	Concerned Citizens of Scott County
Jun-10	Traverse City	Michigan	Wood / Wood Waste (5 proposals defeated)	Michigan Citizens for Energy, the Economy and Environment
May-10	Erie	Pennsylvania	Tires	Keep Erie's Environment Protected
Apr-10	Port St. Joe	Florida	Wood / Wood Waste	Floridians Against Incinerators in Disguise
Apr-10	Elkin	North Carolina	Poultry Waste	Citizens Alliance for a Clean, Healthy Economy
Mar-10	Gretna	Florida	Wood / Wood Waste	Concerned Citizens of Gadsden County
Feb-10	Page County	Virginia	Poultry Waste	Page County Citizens

Grassroots Work Wins

(Most Proposed Energy and Waste Facilities Defeated)



Source: "The Power of Grassroots Resistance to Dirty Energy," www.energyjustice.net/files/grassrootsresistance.pdf

Incinerators: Names Used

- Waste-to-energy (WTE)
- Energy from Waste (EfW)
- Trash-to-steam
- Conversion technologies
- Energy Recovery
- Biomass
- Advanced Thermal Tech
- Waste to Fuel (WTF?)
- Policy buzzwords: “integrated” or “sustainable materials management”



BURN *Baby* **BURN**

World's largest waste corporation driving away from incineration



THE WALL STREET JOURNAL

Jan 3, 2014: “Big Waste Hauler Rethinks Startups”

[pulls out of gasification, pyrolysis, plasma and trash-to-ethanol investments, selling off Agilyx, Enerkem, Fulcrum, Genomatica & InEnTec]

Jul 29, 2014: “Waste Management to Sell Wheelabrator for \$1.94 Billion”

[pulls out of long-standing ownership of Wheelabrator, the second-largest operator of conventional incinerators in U.S.]

EPA: “Non-Hazardous Secondary Materials” rule Waste is now “Fuel”

[Refuse-derived fuel (RDF) or “SpecFuel” or “Processed Engineered Fuel”]



Emerging Threats

- **Refuse-derived fuel (RDF)**
(fuel pellets to burn in coal plants, cement kilns and other boilers)
 - Processed Engineered Fuel
 - SpecFuel
- **Waste to fuels**
 - Trash to ethanol, methanol, jet fuel, naphtha, asphalt...
- **Two-stage incinerators**
 - Pyrolysis
 - Gasification
 - Plasma Arc
- **Anaerobic digestion**
 - Digestated trash marketed as burnable fuel, or as fertilizer or soil amendment; ok if just to pre-process before landfill

Hold Crayola Accountable



www.energyjustice.net/crayola

Experimental Types of Incinerators Don't Work

Gasification, plasma arc and pyrolysis:

- **Can't run continuously**
- **Can't be run effectively at commercial scale**
- **Can't process heterogenous feedstocks like trash**
- **Companies with no real history bamboozle local officials into subsidizing projects that fail, technically and financially**
- **The companies usually lie about their emissions, claiming zero emissions or “no smokestack”**

EPA says pyrolysis/gasification = incineration

40 CFR 60.51a:

- **Municipal waste combustor**, MWC, or municipal waste combustor unit: (1) **Means any setting or equipment that combusts solid, liquid, or gasified MSW including, but not limited to,** field-erected incinerators (with or without heat recovery), modular incinerators (starved-air or excess-air), boilers (i.e., steam-generating units), furnaces (whether suspension-fired, grate-fired, mass-fired, air curtain incinerators, or fluidized bed-fired), and **pyrolysis/combustion units**.
- **Pyrolysis/combustion unit** means **a unit that produces gases,** liquids, or solids **through the heating of MSW, and the gases,** liquids, or solids produced **are combusted and emissions vented to the atmosphere.**

“**A municipal waste incinerator** 'combusts' solid waste and thus **is functionally synonymous with municipal waste combustor.**”

(www.epa.gov/ttn/nsr/gen/rm_2.html)

Pyrolysis is a failed technology

Patent review company:

- **has been seeing pyrolysis projects for 14 years**
- **none of them are legitimate**
- **they're just splitting combustion into two steps, making it more expensive, less efficient and not any cleaner**
- **sees a steady stream of guys in their 50s-70s who worked at corporations, thought it's a great idea, and go out and promote it and get money by whatever means and get some patent coverage mainly to help get the money, but none are legit**

Pyrolysis is a failed technology

Rubber Manufacturers Association:

- **“Major tire companies like Goodyear and Firestone once invested ‘immense resources’ in pyrolysis but could not find markets for the byproducts or even a way to integrate them into their own products. And scores of start-ups have tried and failed to make money from tire pyrolysis.”**
- **“The road is littered with the carnage of people who were trying to make this technology viable.”**

Pyrolysis is a failed technology

- **Not intended for continuous operation**
 - **Runs batch processes**
 - **Mainly used at demonstration scale**
- **Can only operate on homogenous fuels**

Environmental Protection Agency:

- **While technically feasible, tire pyrolysis – a process in which tires are subjected to heat in an oxygen-starved environment and converted to gas, oil and carbon char – has been inhibited by the high capital investment required and steep operating costs**

Technologies and Risk

Source: Gershman, Brickner & Bratton, Inc. August 2012

Alternative	Risks/Liability	Risk Summary
Mass Burn/WaterWall	Proven commercial technology	Very Low
Mass Burn/Modular	Proven commercial technology	Low
RDF/ Dedicated Boiler	Proven commercial technology	Low
RDF/Fluid Bed	Proven technology; limited U.S. commercial experience	Moderate to Low
Anaerobic Digestion	Proven technology; limited U.S. commercial experience	Moderate to Low
Mixed-Waste Composting	Previous large failures; No large-scale commercially viable plants in operation; subject to scale-up issues	Moderate to high
Pyrolysis	Previous failures at scale, uncertain commercial potential; no operating experience with large-scale operations	High
Gasification	Limited operating experience at only small scale; subject to scale-up issues	High
Chemical Decomposition/ Depolymerization	Technology under development; not a commercial option at this time	High



Basic Lessons

- Garbage-in, Garbage-out.
- Nothing is 100%.
- Small amounts matter, especially if they're a small % of a BIG number.
- Over 99% of incinerator proposals are defeated by grassroots opposition or fail on their own.
- If incineration is the answer, someone asked the wrong question
- Incinerators are habitual law-breakers and Covanta is notorious

Bigger Problems with Incinerators

- Destroys materials / net energy issues
 - “waste-OF-energy” – **3-5 times** more energy saved by recycling/composting
- Environmental racism
- Global warming contribution worse than zero waste solutions
- Makes the problem "invisible" rather than making it very visible so that unsustainably-produced products can be properly dealt with

Incinerators are...

~~Trash-to-Steam~~

*Trash to toxic ash and toxic
air emissions*

Incinerators are...

~~Waste-to-Energy~~

Waste-OF-energy

(3-5 times more energy wasted by not recycling/composting the materials burned)

Source: Morris, Jeffrey, and Canzoneri, Diana, "Recycling Versus Incineration: An Energy Conservation Analysis," Sound Resource Management Group (SRMG) Seattle, Washington, September, 1992.

www.sciencedirect.com/science/article/pii/0304389495001166



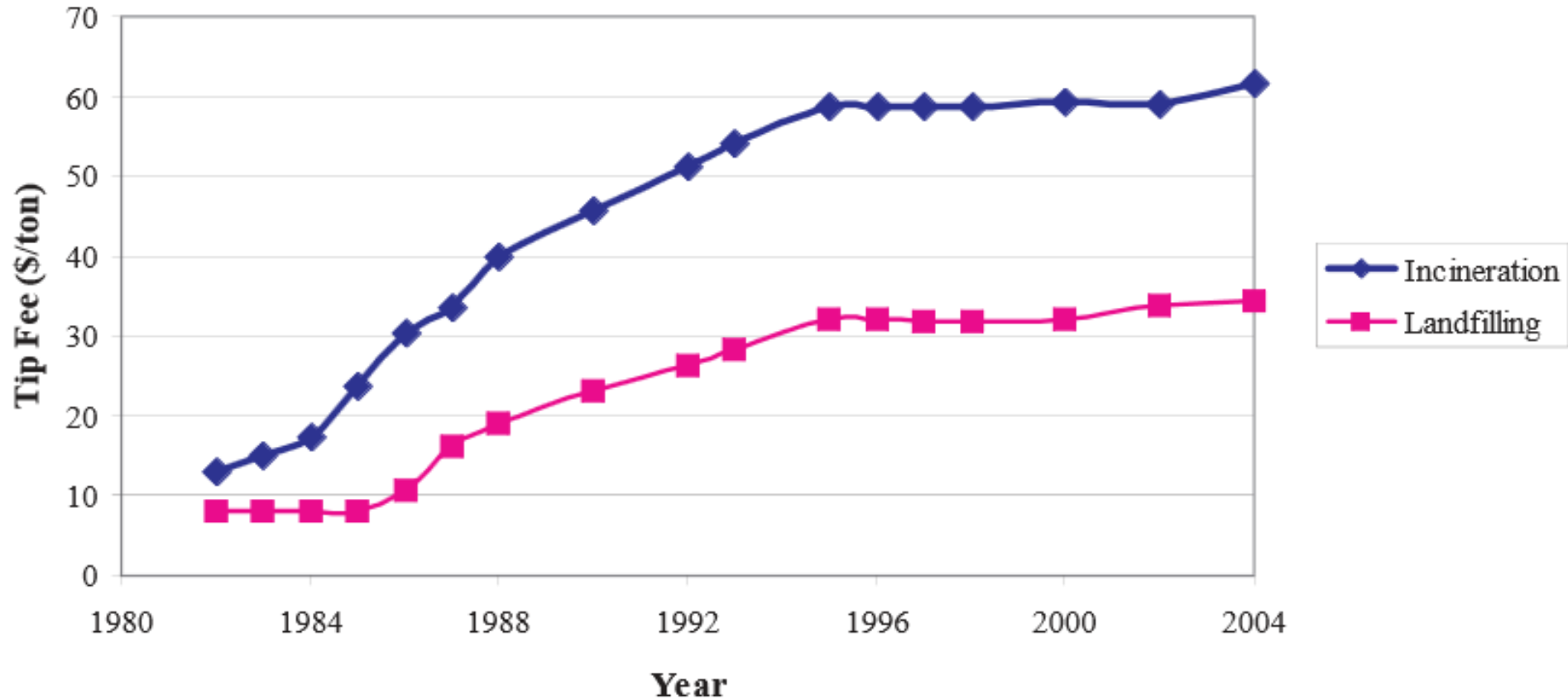
Most Expensive Way to Manage Waste

“Waste-to-energy is an additional capital cost. That is not in dispute, compared to a landfill... compared to a landfill, which is a less capital-intensive structure – it is more expensive. If you had a landfill next to a waste-to-energy facility, then almost in every case, you would think the landfill is going to be cheaper.”

Ted Michaels, President, Energy Recovery Council, March 18, 2013 testimony before Washington, DC City Council

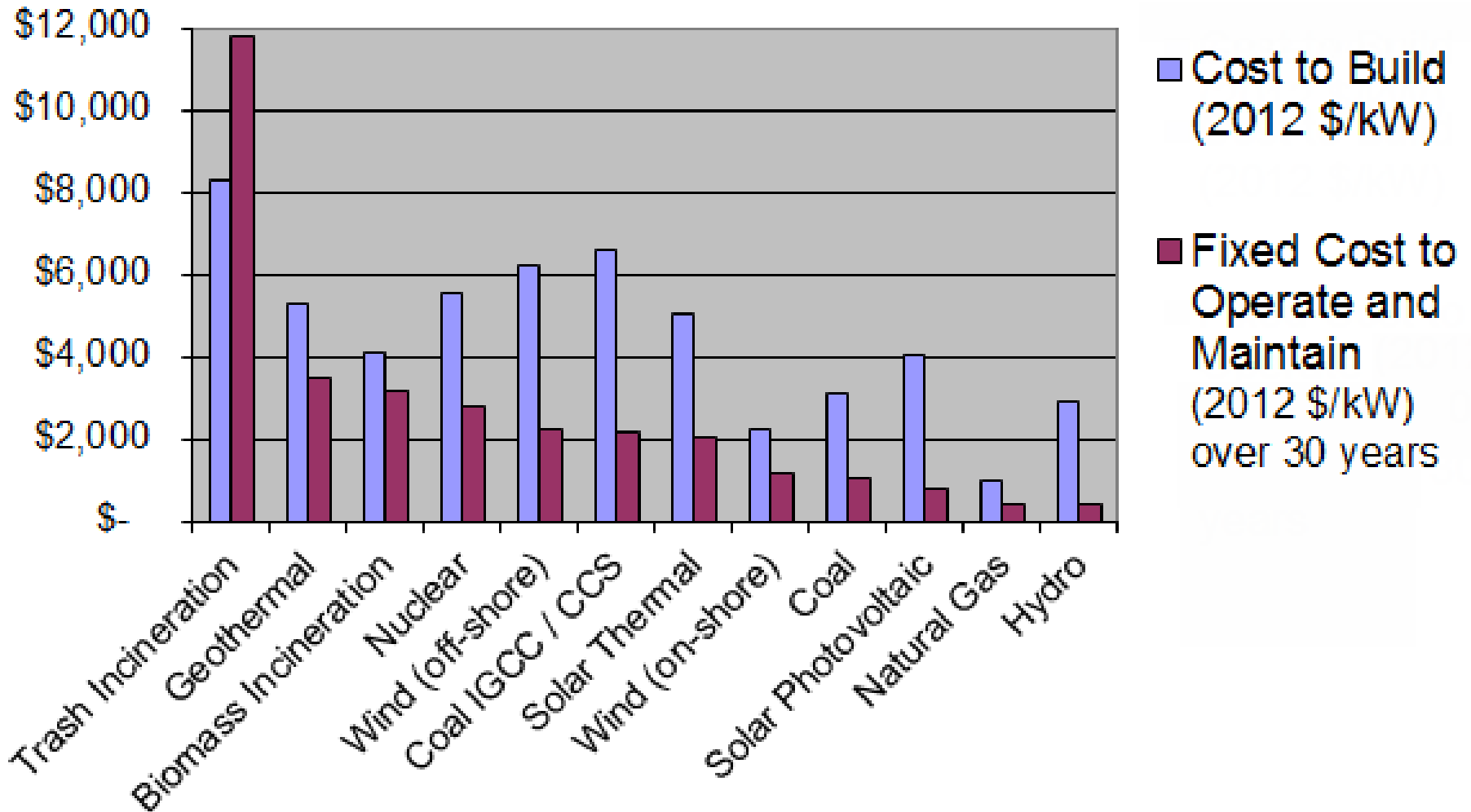
Most Expensive Way to Manage Waste

Figure 3. Landfill and Incinerator Tip Fees



Source: National Solid Waste Management Association 2005 Tip Fee Survey, p4.
www.environmentalistseveryday.org/docs/Tipping-Fee-Bulletin-2005.pdf

Most Expensive Way to Make Energy



Source: "Updated Capital Cost Estimates for Utility Scale Electricity Generating Plants," Energy Information Administration, April 2013, p.6, Table 1. Full report here: www.eia.gov/forecasts/capitalcost/pdf/updated_capcost.pdf

Problems with Incinerators: Economics

- Capital Intensive (Expensive)
- Requires long-term monopoly contracts "Put-or-Pay" contracts including "put or pay" clauses that punish local governments if they recycle / compost
- Competes with zero waste AND energy alternatives
 - Competes with wind and solar in Renewable Portfolio Standards*
- Economic incentives encourage burning more dangerous wastes (getting paid to take waste vs. paying for fuels)

* Currently, trash incineration is only in direct competition with wind and solar in Maryland's RPS law, but this affects many other states, and biomass incineration and landfill gas burning competes directly with wind and solar in most RPS laws.

Incineration Competes with Recycling

- **Needs paper and plastics (and wood and tires) to burn effectively**
- **Must be fed enough waste**
- **Waste contracts are designed to punish recycling**

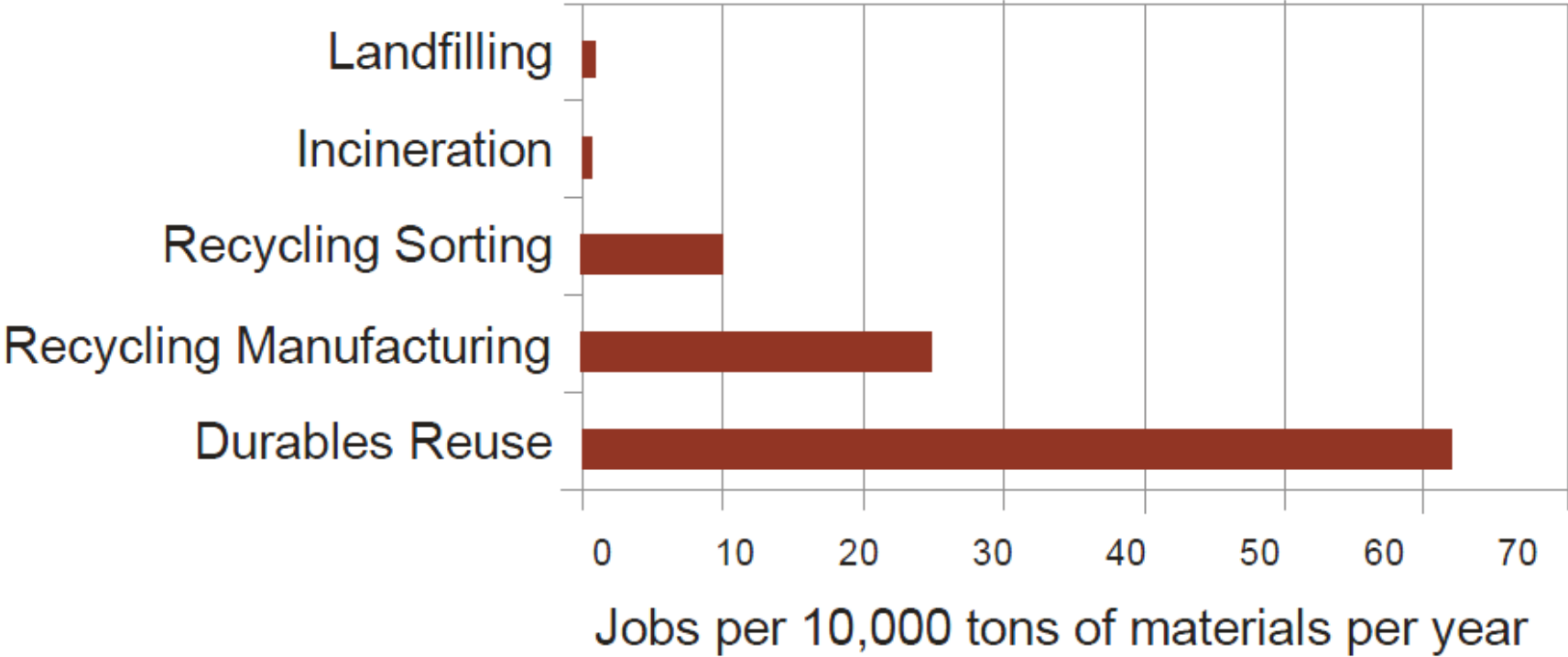


Incinerators Burn Money

- Harrisburg, PA: incinerator was primarily responsible for bankrupting Pennsylvania's capital city
- Claremont, NH: 20-year "put-or-pay" contracts caused 29 towns to file for bankruptcy in 1993, which the court denied, requiring that taxes be raised to pay back the incinerator for waste the towns did not even produce
- Hudson Falls, NY and Lake County, FL – deep incinerator debt due to long-term contracts favorable to the industry
- Poughkeepsie, NY – incinerator fails to bring in enough revenue from tipping fees and electric sales to operate without millions in annual subsidies from the county
- Detroit, MI – the nation's largest incinerators by design capacity – has cost the ailing city \$1.2 billion in debt payments over 20 years, bringing the city close to bankruptcy on three occasions.
- All of New Jersey's five trash incinerators had to be bailed out by the state taxpayers with over \$1.5 Billion because they could not attract enough waste to operate at capacity.

Worst Way to Create Jobs

Job Creation: Reuse & Recycling vs Disposal



Source: Institute for Local Self Reliance



Job Creation: Reuse & Recycling Versus Disposal in the United States

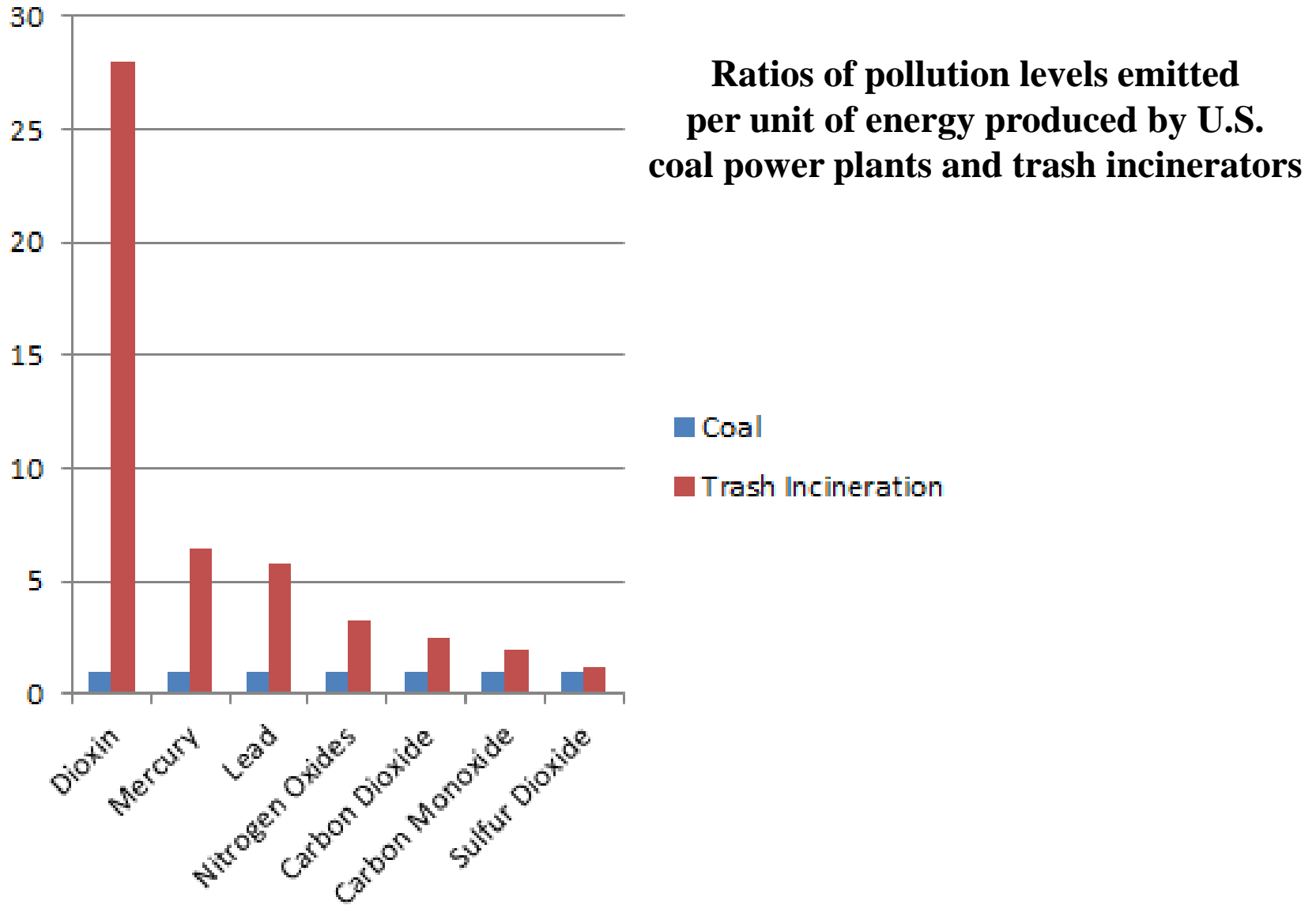
Type of Operation	Jobs Per 10,000 Tons per Year
Product Reuse	
Computer Reuse	296
Textile Reclamation	85
Misc. Durables Reuse	62
Wooden Pallet Repair	28
Recycling-Based Manufacturers	25
Paper Mills	18
Glass Product Manufacturers	26
Plastic Product Manufacturers	93
Conventional MRFs¹⁰¹	10
Composting	4
Incineration	1
Landfilling	1

Incineration Worse than Coal

Toxic Air Emissions are...

- **Dioxins / furans** (28 times as much)
- **Mercury** (6-14 times as much)
- **Lead** (6 times as much)
- **Nitrogen Oxides (NO_x)** (3.2 times as much)
- **Carbon Monoxide (CO)** (1.9 times as much)
- **Sulfur Dioxide (SO₂)** (20% worse)
- **Carbon Dioxide (CO₂)** (2.5 times as much)

Incineration Worse than Coal





Incinerator, Not a Power Plant

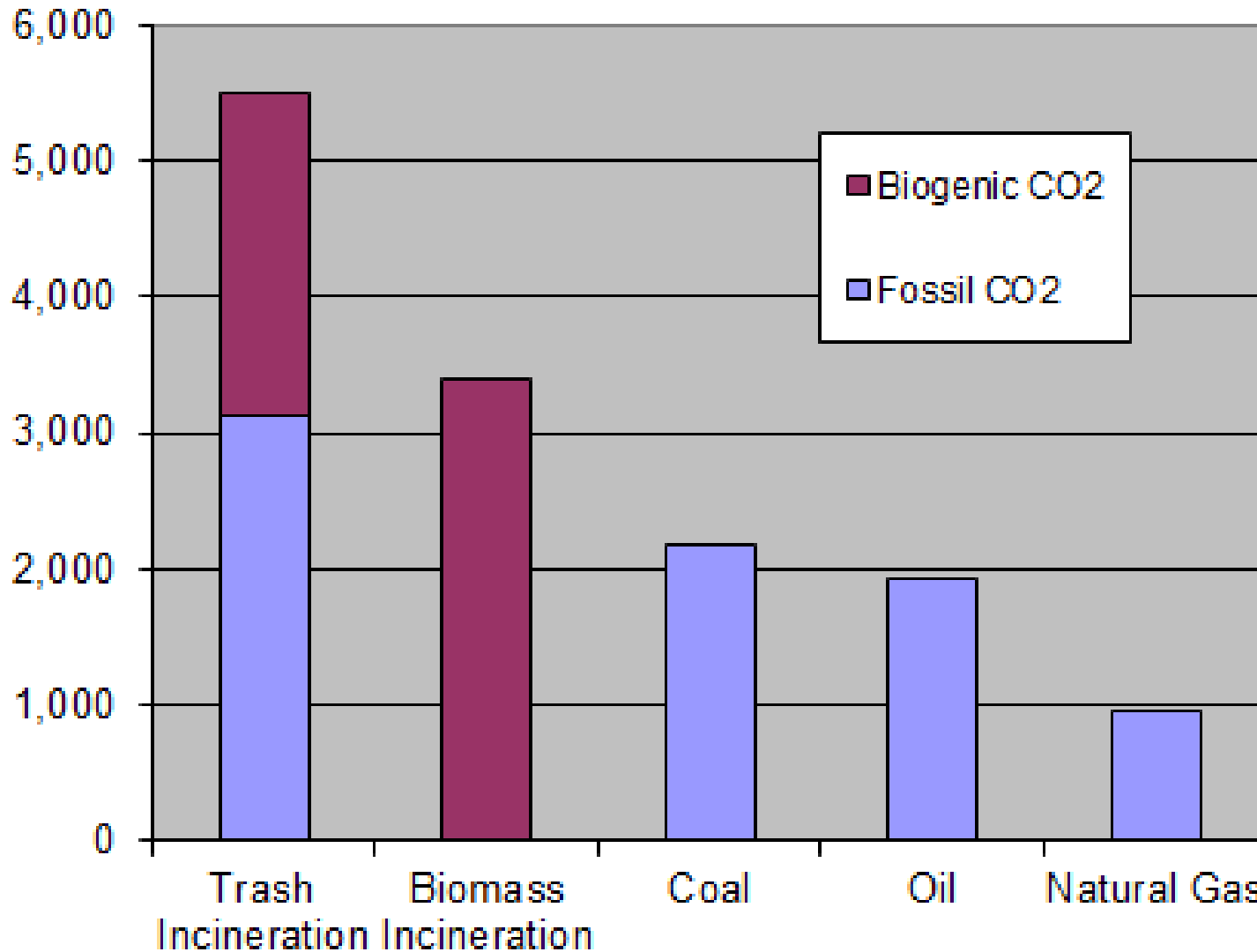
“a waste-to-energy plant is designed to manage solid waste... the electricity output is a secondary function”

Ted Michaels, President, Energy Recovery Council, March 18, 2013 testimony before Washington, DC City Council

Global Warming Pollution

Smokestack CO2 Emissions from U.S. Power Plants

CO2 (lbs/MWh)



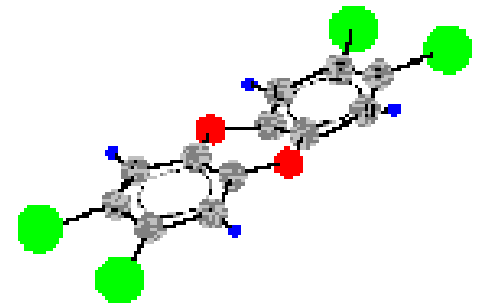
Data is in pounds of CO2 per unit of energy produced (lbs/MWh)

Source: U.S. EPA
Emissions &
Generation
Resource Integrated
Database (eGRID)
v.9, released
2/24/2014
(2010 data)

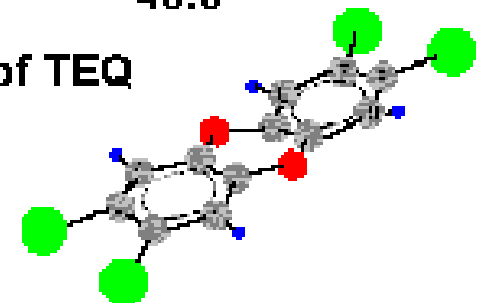
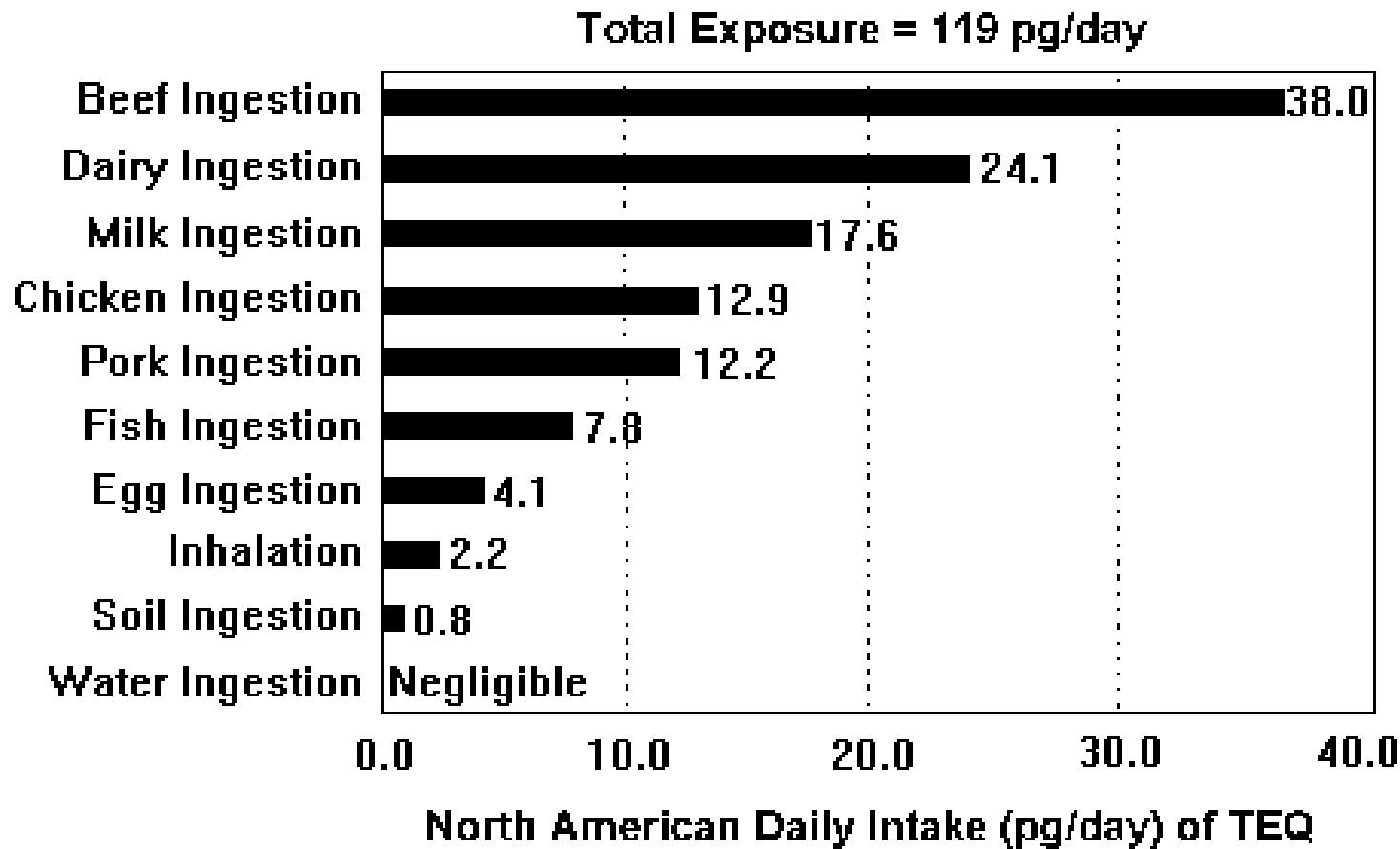
Dioxin Facts

- Dioxins and furans are the most toxic chemicals known to science. They are highly toxic even in miniscule amounts.
- Dioxins cause infertility, learning disabilities, endometriosis, birth defects, sexual reproductive disorders, damage to the immune system, cancer and more.
- 93% of dioxin exposure is from eating meat and dairy products.

www.ejnet.org/dioxin/

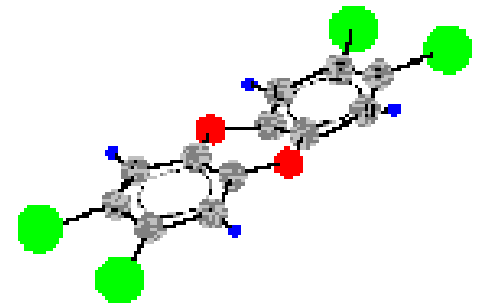


Exposure to Dioxins

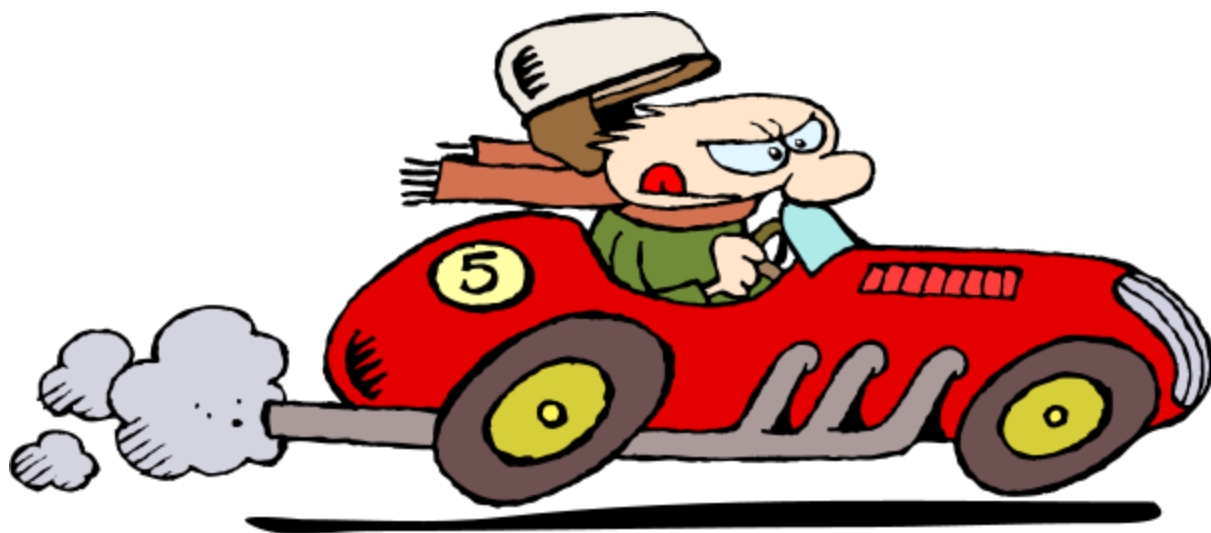


How to make dioxin

- Dioxins are created by burning hydrocarbons with chlorine in the presence of oxygen.
- Dioxin emissions increase when:
 - More chlorine is in the fuel/waste stream
 - Certain metal catalysts are present (Copper, Iron, Zinc...)
 - The gases stay in a low temperature range (200-450° C)



Continuous Emissions Monitors



Continuous Emissions Monitors

- Only generally used for 3 pollutants: sulfur oxides (SO_x), nitrogen oxides (NO_x) and carbon monoxide (CO) plus opacity, oxygen and temperature
- Technology now exists to continuously monitor:

Ammonia (NH₄)

Carbon Dioxide (CO₂)

Hydrogen Sulfide (H₂S)

Acid Gases:

Sulfuric Acid (H₂SO₄)

Hydrofluoric Acid (HF)

Hydrochloric Acid (HCl)

Products of Incomplete Combustion (PICs):

Dioxins & Furans

Polycyclic Aromatic Hydrocarbons (PAHs)

Volatile Organic Compounds (VOCs)

Particulate Matter (PM)

Metals:

Antimony (Sb)

Arsenic (As)

Barium (Ba)

Cadmium (Cd)

Chromium (Cr)

Lead (Pb)

Manganese (Mn)

Mercury (Hg)

Silver (Ag)

Nickel (Ni)

Zinc (Zn)

...and more



Incineration Worse than Landfills

- Incinerators still require landfills for their toxic ash
- Choice is NOT landfill vs. incinerator, but:

landfill

vs.

incinerator AND a smaller, more toxic landfill

Incineration Worse than Landfills

- Incinerators still require landfills for their toxic ash
- Choice is NOT landfill vs. incinerator, but:

landfill

vs.

incinerator AND a smaller, more toxic landfill

OR...

Zero Waste and minimal landfilling

Incineration Worse than Landfills

- Incinerators still require landfills for their toxic ash
- 30 tons of ash produced for every 100 tons burned





Incinerator Ash = Hazardous Waste

Incinerator ash is toxic, but the U.S. EPA allows a special test that enables it to test as non-hazardous, saving the industry a lot of money

Despite Canada relying on the same test, Vancouver's incinerator ash is leaching toxic cadmium at levels about twice the province's acceptable limits. They've had to ship the hazardous ash to a hazardous waste landfill in Alberta.



Incineration Worse than Landfills

- Makes landfills more toxic (from ash or slag dumped) ...*or worse*, they try to reuse them
- Liquid wastes (more common to fuels conversion technologies)
- Air Pollution
 - Organic pollutants (Dioxins/furans, Volatile Organic Compounds / PAHs)
 - Toxic metals (mercury, arsenic, lead, cadmium, etc.)
 - Acid Gases (Hydrogen Fluoride, Hydrochloric Acid, Sulfuric Acid)
 - Particulate matter
 - Nitrogen Oxides (NO_x), Sulfur Oxides (SO_x)

How to Compare?

- **Population impacted & environmental justice**
- **Human health impacts**
 - Nitrogen Oxide emissions (asthma)
 - Particulate emissions
 - Toxic and Cancer-causing emissions
- **Eutrophication**
- **Acidification (acid rain...)**
- **Ecosystem toxicity**
- **Ozone depletion**
- **Smog formation**
- **Global warming**
- **Cost**



Life Cycle Analysis on DC Waste Options

Analysis done by:

Jeffrey Morris, Ph.D. (Economics)

Sound Resource Management Group

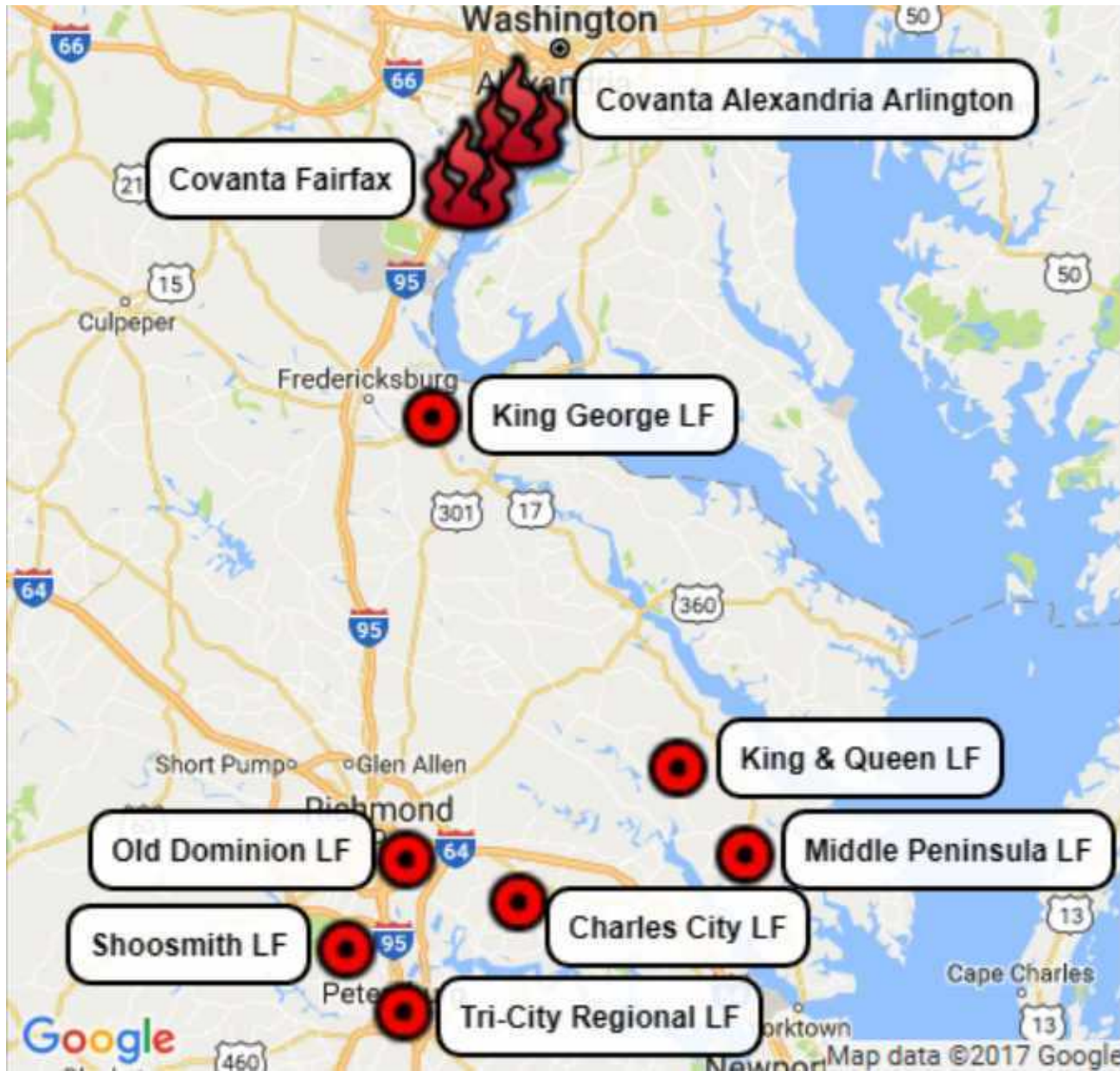
360-867-1033

jeff.morris@zerowaste.com

www.zerowaste.com

Dr. Morris authored several peer reviewed published studies on waste systems.

Where DC's waste went (to VA) in 2016:



Covanta Fairfax Reported Emissions (2014)

Global Warming Pollutants	Pounds released (2014)
Carbon Dioxide (CO ₂)	2,169,540,876
Methane (CH ₄)	762,927
Nitrous Oxide (N ₂ O)	100,130
Health Damaging Pollutants	Pounds released (2014)
Carbon Monoxide	11,319
Hydrochloric Acid	57,408
Hydrofluoric Acid	1,385
Lead	68
Nitrogen Oxides (NO _x)	3,398,301
Particulate Matter (PM ₁₀)	14,709
Fine Particulate Matter (PM _{2.5})	8,862
Sulfur Dioxide	257,899
Volatile Organic Compounds	11,813

Covanta Fairfax Emissions

Within 20 miles of DC's borders, Covanta Fairfax is...

- **#1 in Nitrogen Oxides**
 - So high that Covanta's home state of New Jersey singled out this incinerator as ineligible to sell renewable energy credits to NJ
 - #2 in the entire industry, worse than the Detroit incinerator (which has no NOx controls)
- **#1 in Carbon Dioxide**
- **#1 in Hydrochloric Acid**
- **#1 in Hydrofluoric Acid (was worst in their industry in 2008)**
- **#1 in Mercury**
- **#4 in Sulfur Dioxide**
- **Top 10 in Lead**
- **#3 in overall air pollution (after Dulles and DCA Airports)**

Life Cycle Analysis on DC Waste Options

- All comparison data includes pollution from trucking.
 - Note the tiny difference that doubling hauling distance makes.
- A 75% landfill gas capture rate is assumed, based on what was reported to us in calls to the four landfills. All three we reached independently reported the same percentage.
- For the landfills, the best data available for DC waste composition is used. Where categories were vague, we filled in the proportions with more detailed data from Montgomery County's waste characterization study. Actual emissions data for Covanta Fairfax is used, as reported to EPA.
- We used local precipitation data from the areas where the landfills are located, which is wetter than average.
- “Other 3 Landfills” = King & Queen LF, Middle Peninsula LF, and Charles City LF

Conservative Assumptions on Global Warming

- This study looks at the 20-year impact (most relevant for methane's impacts on global warming) as well as the 100-year impact. The 20-year impact, based on methane being worse in the short-term, makes landfills out to be worse than they are when evaluated over 100 years.
- This study uses the latest science for methane's global warming potential (86 times worse than CO₂ over 20 years based on the latest International Panel on Climate Change report).

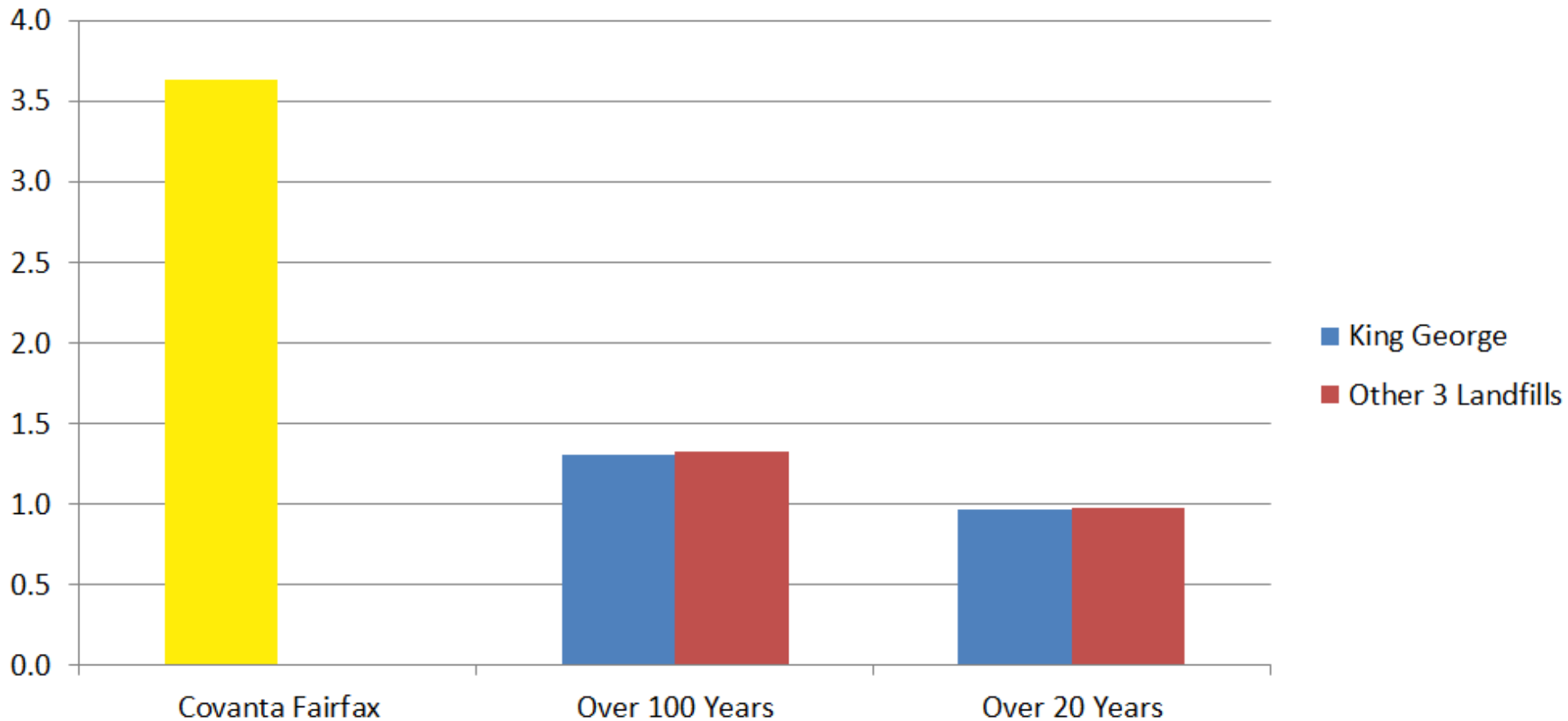
See www.energyjustice.net/naturalgas/#GWP for a link to the various data sources in the evolving science on global warming potentials.

Conservative Assumptions on Toxicity

- This study did not factor in two main things that would also trend toward incinerators being worse than landfills:
 - It did not include data on leaching of toxic chemicals from incinerator ash, but DID include leaching from trash. In fact, leaching of toxic chemicals from incinerator ash is expected to be worse, especially where the ash is used as landfill cover or is mixed with municipal solid waste, as it is in Old Dominion Landfill.
 - Dioxin/furan emissions were not included. This was due to a lack of good data on dioxin emissions from landfills. Dioxins and furans are the most toxic man-made chemicals known to science, and are largely associated with incineration sources, so ignoring them biases the study in a conservative way, making incinerators out to be less toxic than they truly are.

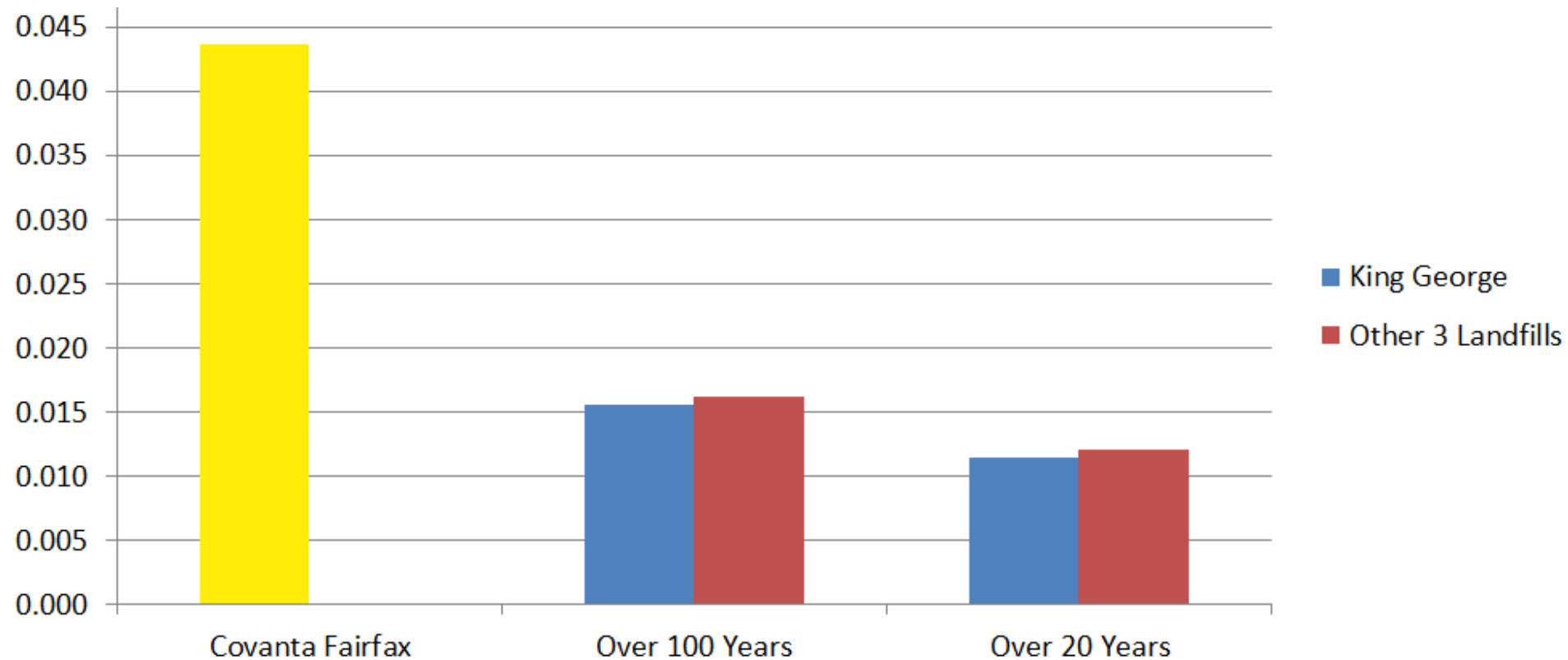
Nitrogen Oxide (NOx) Pollution

[Pounds of NOx per ton of waste disposed.]



Particulate Matter Pollution

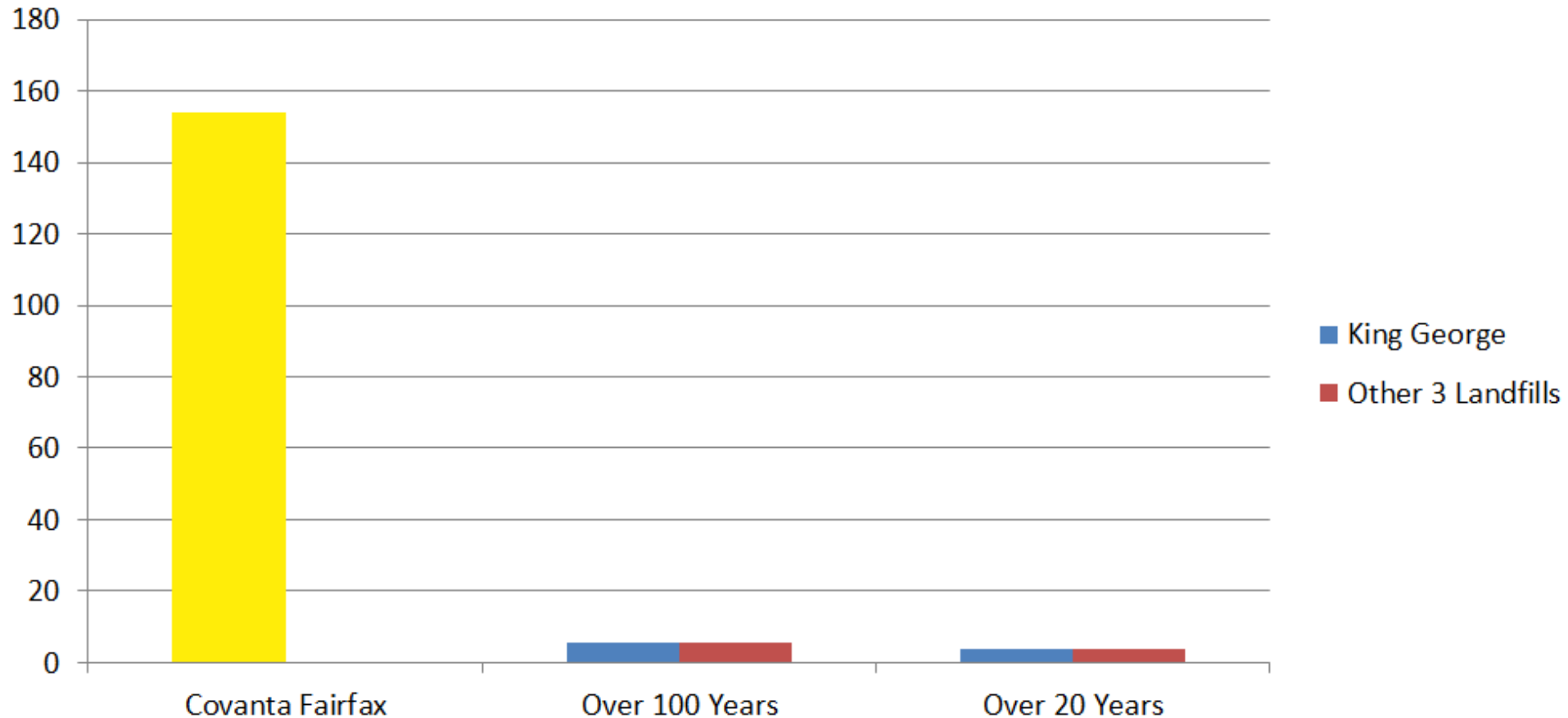
[Pounds of PM2.5 equivalent per ton of waste disposed.]



Toxic Pollution

[Pounds of toluene equivalent per ton of waste disposed.]

Does not include dioxin/furan emissions or ash leaching.

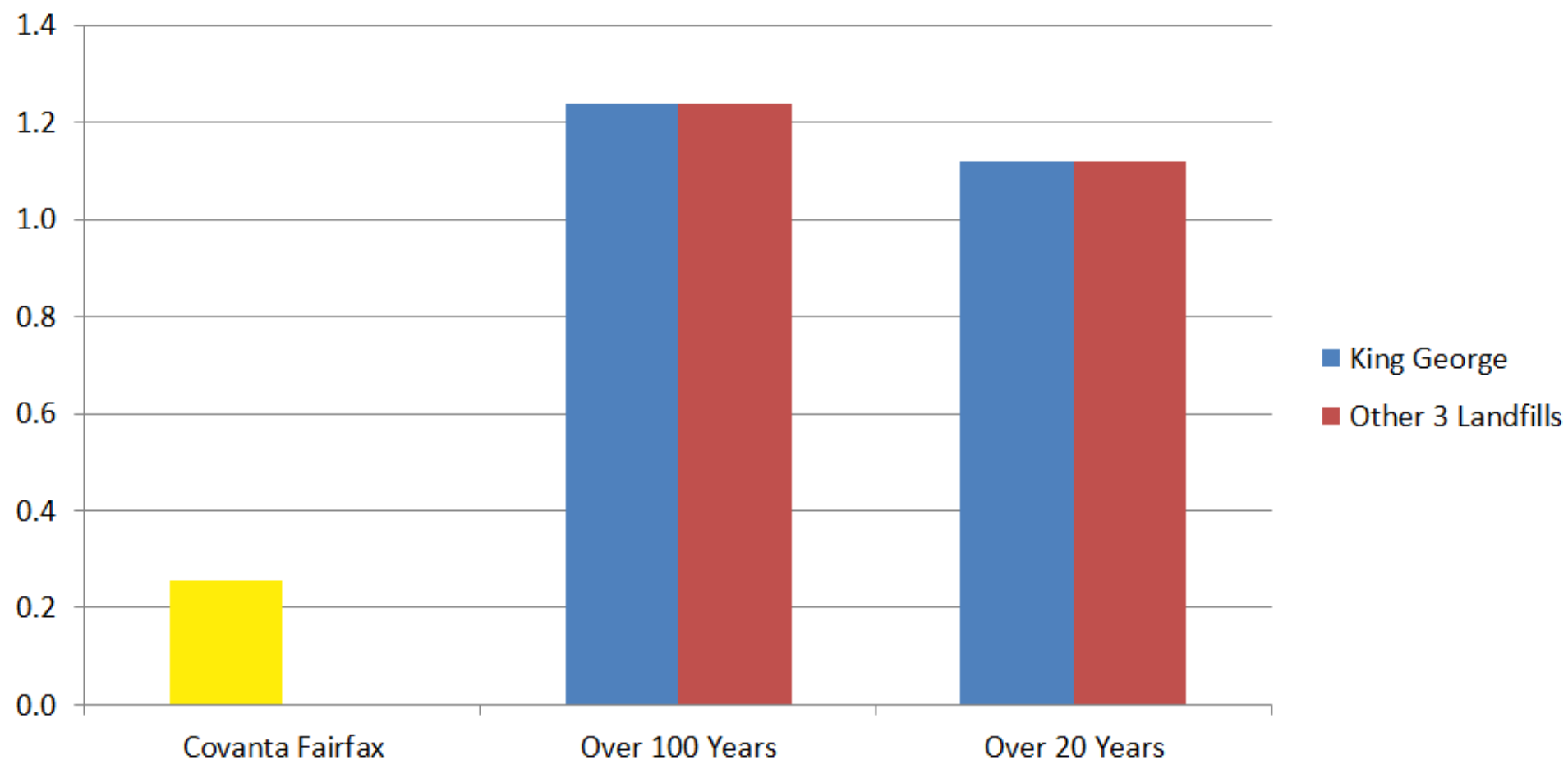




Carcinogenic Pollution

[Pounds of benzene equivalent per ton of waste disposed.]

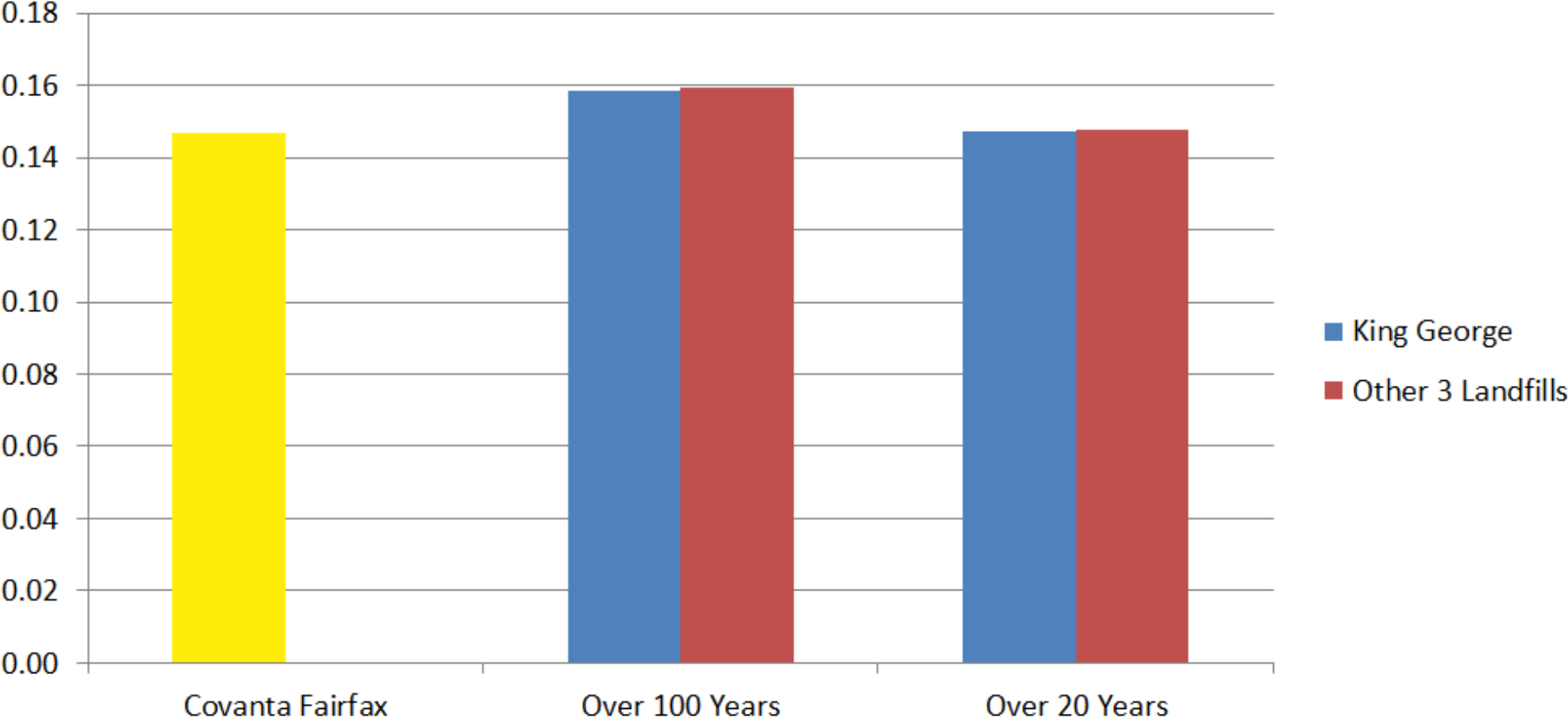
Does not include dioxin/furan emissions or ash leaching.



Eutrophication

[Pounds of nitrogen equivalent per ton of waste disposed.]

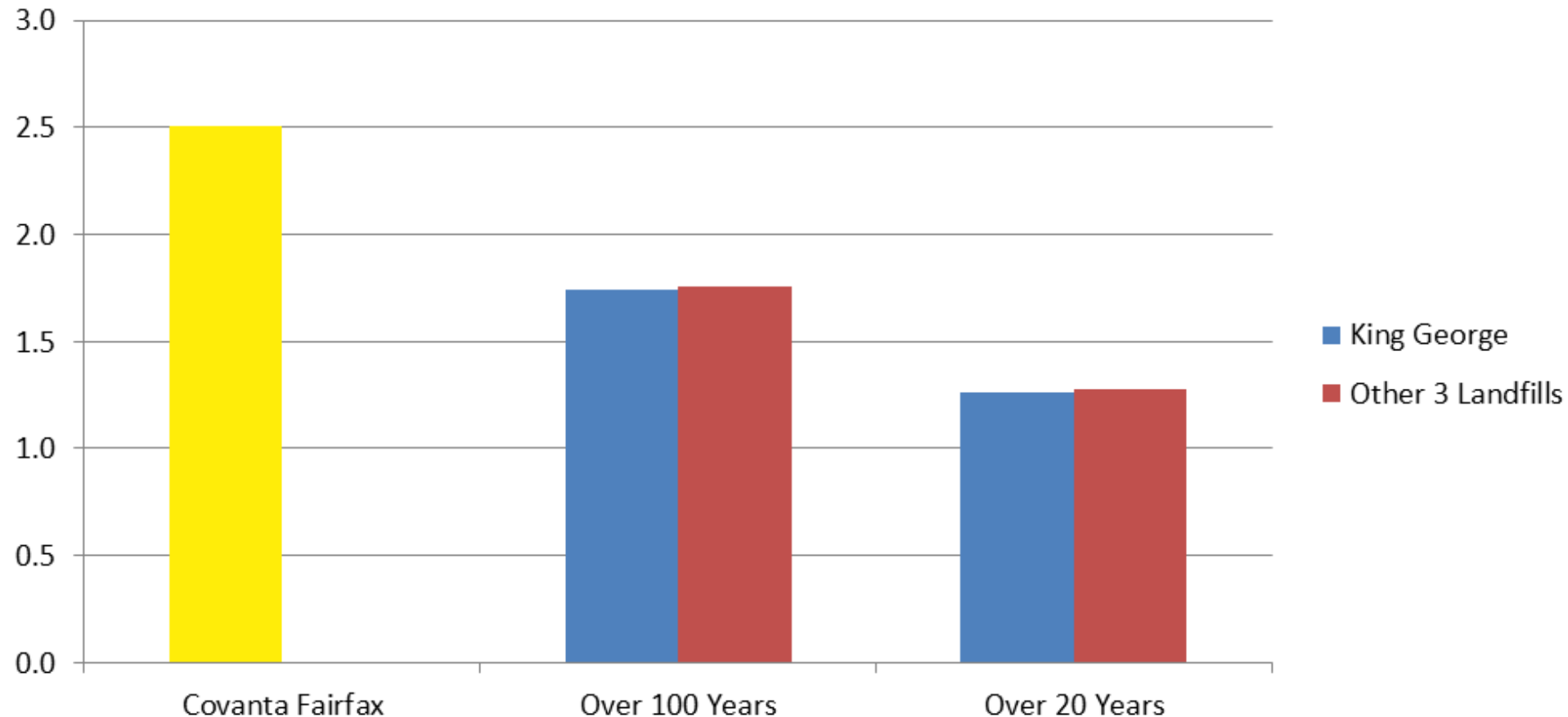
NOx and ammonia air emissions plus BOD, COD, phosphate, and ammonia water releases from landfills.



Acidification

[Pounds of SO₂ equivalent per ton of waste disposed.]

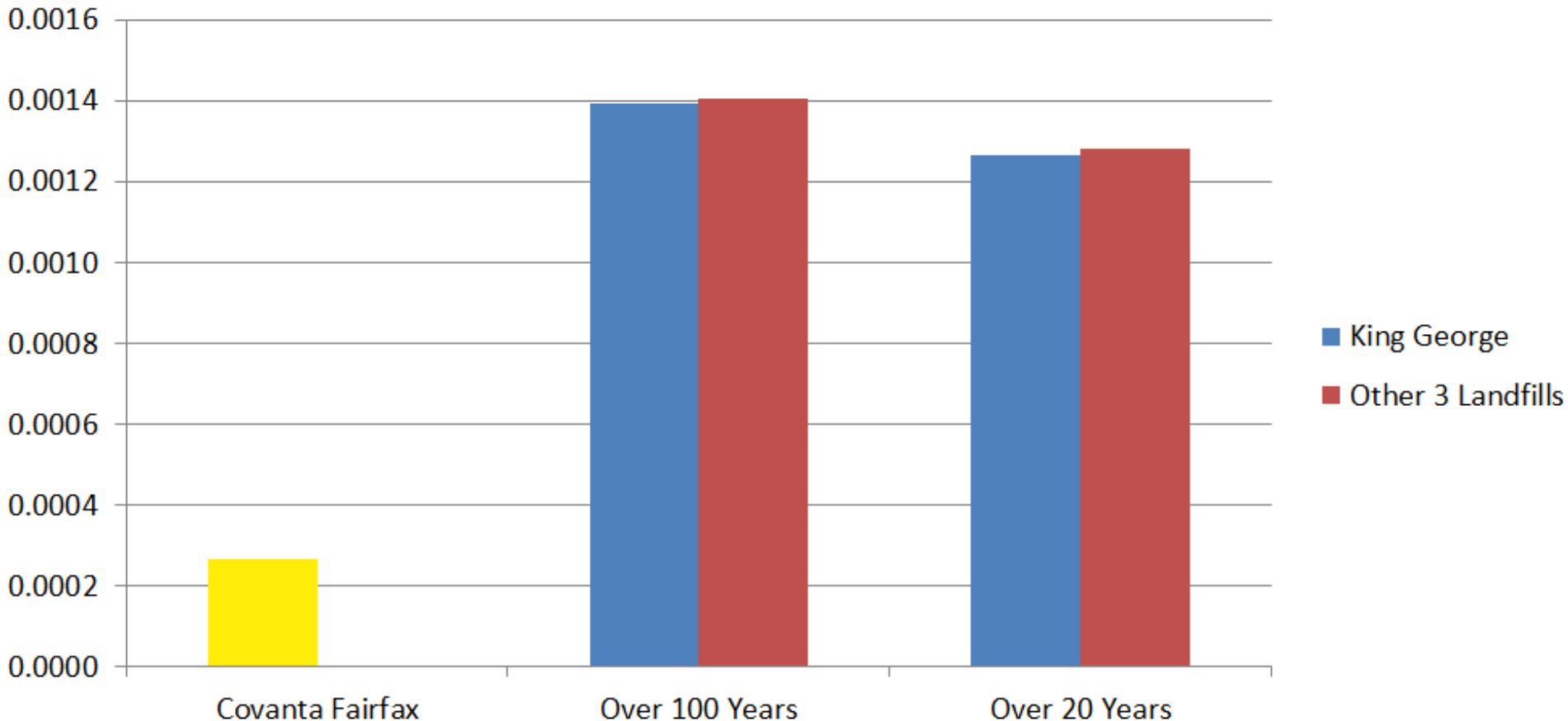
Incinerator emissions are largely from nitrogen oxides, but also include other acid gases (SO₂, HCl, HF). For the landfills, it's hydrogen sulfide (H₂S) from the landfill, plus ammonia, NO_x and SO_x from the landfill gas burners.



Ecosystems Toxicity

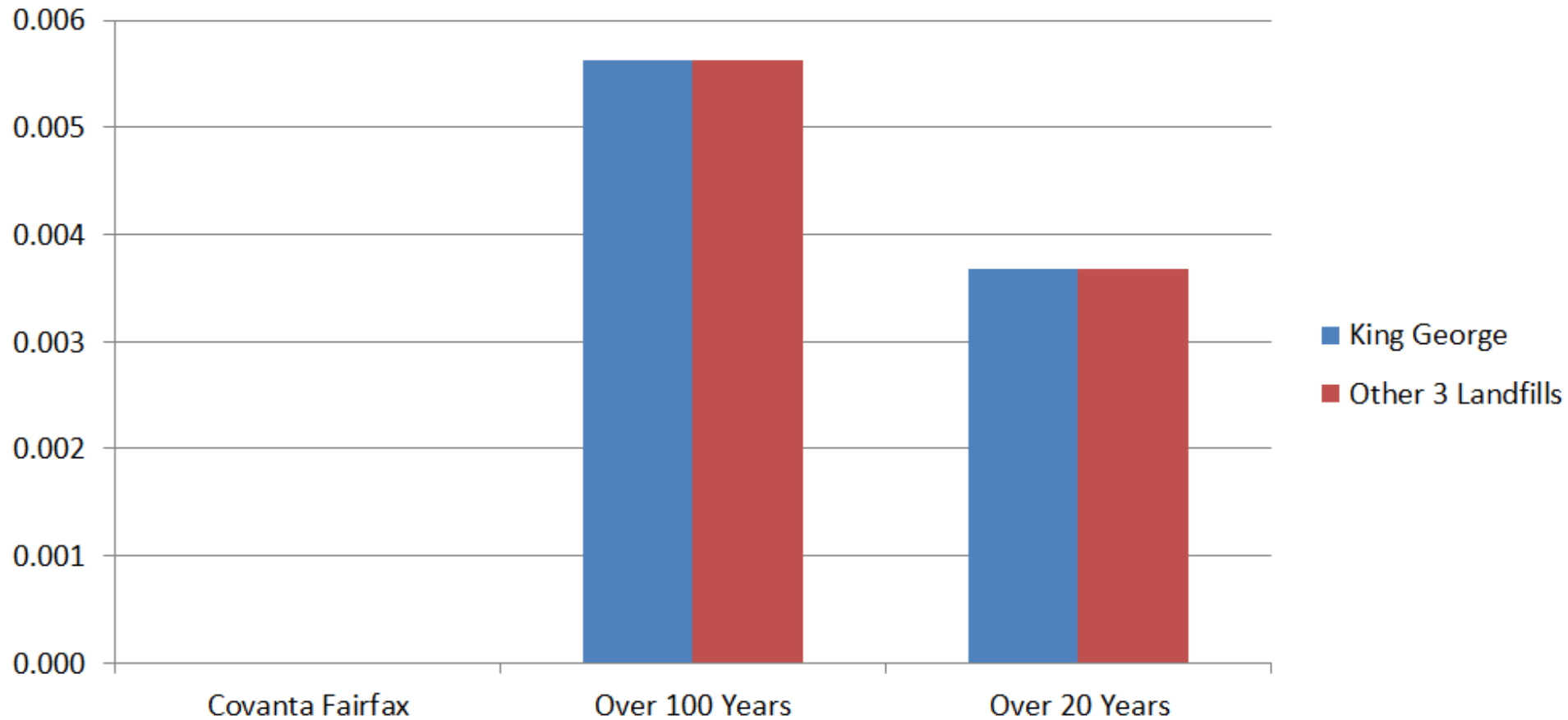
[Pounds of 2,4-D herbicide equivalent per ton of waste disposed.]

For the incinerator, this is mainly based on mercury emissions. For the landfill, mainly formaldehyde.



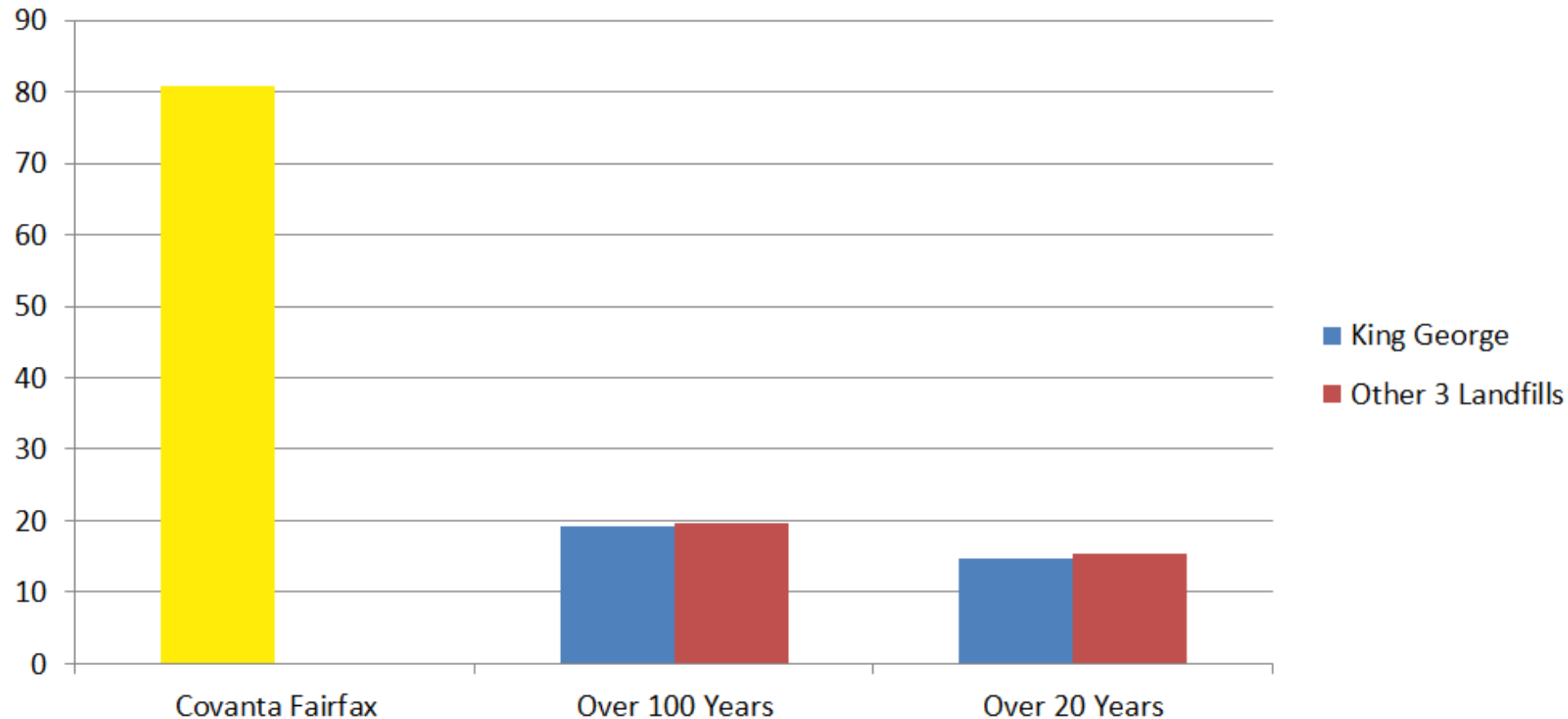
Ozone Depletion

[Pounds of CFC-11 equivalent per ton of waste disposed.]



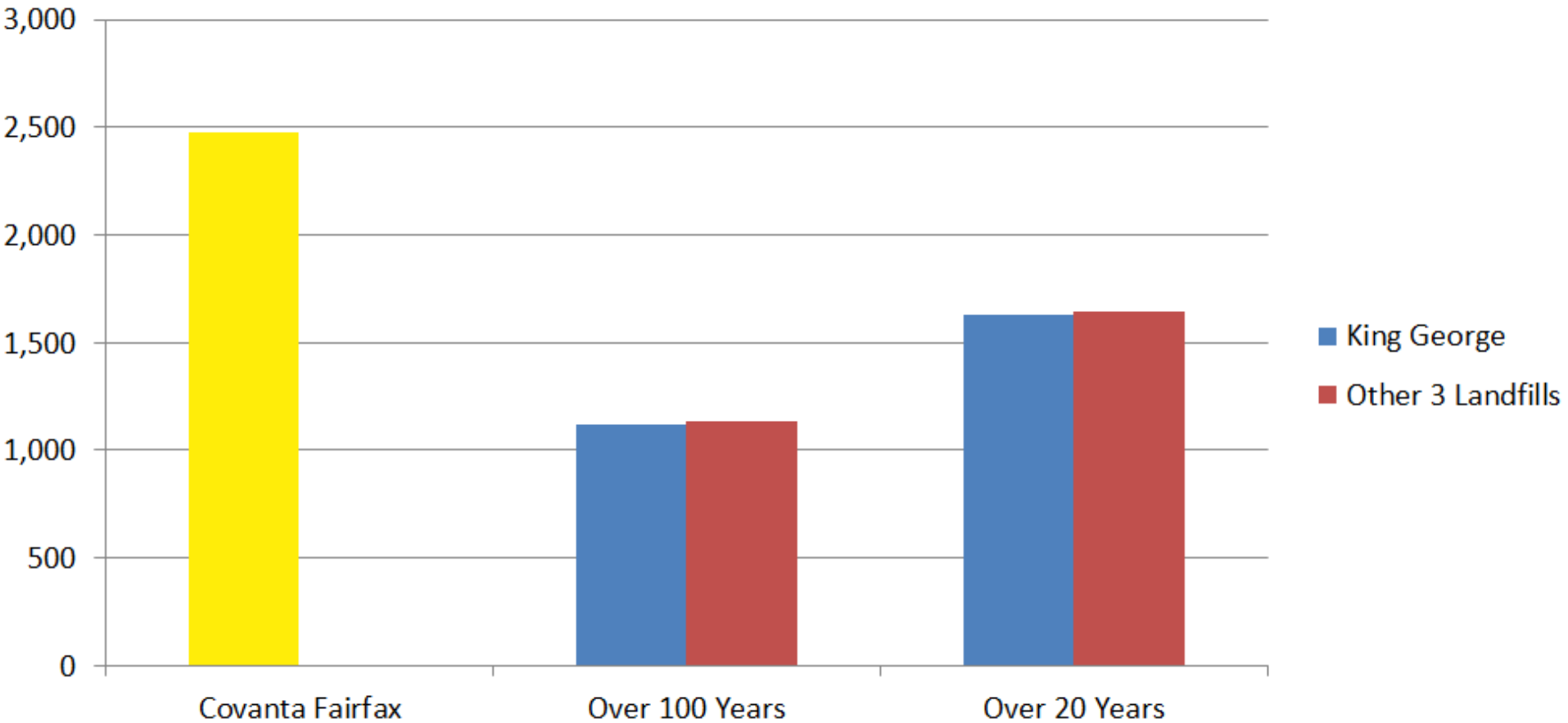
Smog Formation

[Pounds of ozone (O₃) equivalent per ton of waste disposed.]



Global Warming Pollution

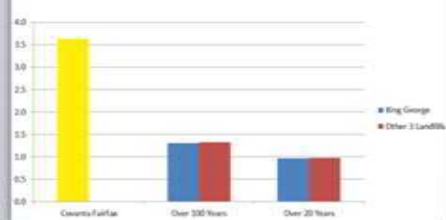
[Pounds of CO₂ equivalent per ton of waste disposed.]



Incineration worse than Landfills

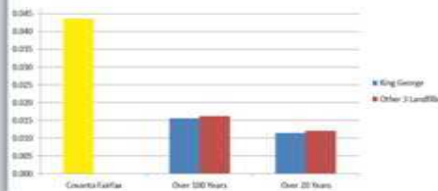
Nitrogen Oxide (NOx) Pollution

[Pounds of NOx per ton of waste disposed.]



Particulate Matter Pollution

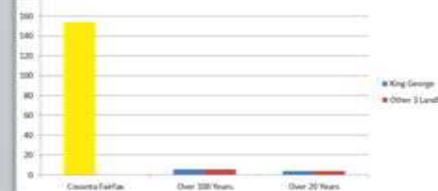
[Pounds of PM2.5 equivalent per ton of waste disposed.]



Toxic Pollution

[Pounds of toluene equivalents per ton of waste disposed.]

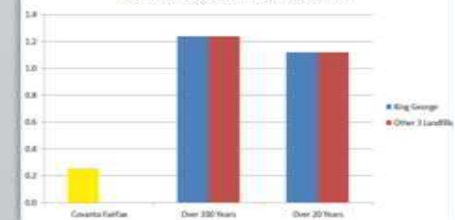
Does not include dioxin/furan emissions.



Carcinogenic Pollution

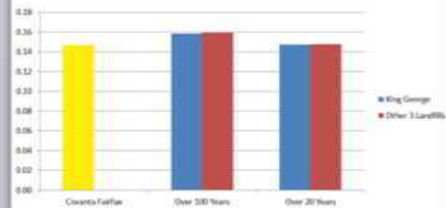
[Pounds of benzene equivalent per ton of waste disposed.]

Does not include dioxin/furan emissions.



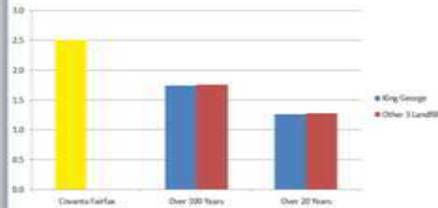
Eutrophication

[Pounds of nitrogen equivalent per ton of waste disposed.]



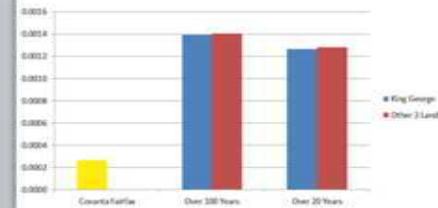
Acidification

[Pounds of SO₂ equivalent per ton of waste disposed.]



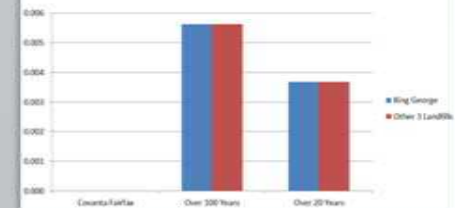
Ecosystems Toxicity

[Pounds of 2,4-D herbicide equivalents per ton of waste disposed.]



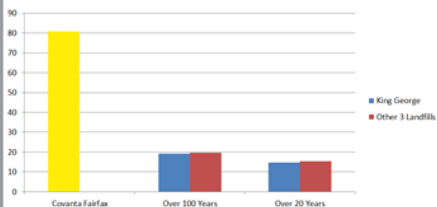
Ozone Depletion

[Pounds of CFC-11 equivalent per ton of waste disposed.]



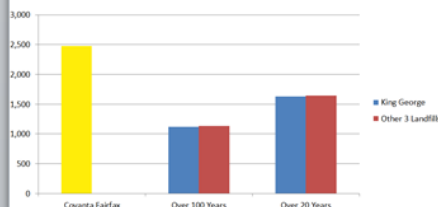
Smog Formation

[Pounds of ozone (O₃) equivalent per ton of waste disposed.]



Global Warming Pollution

[Pounds of CO₂ equivalent per ton of waste disposed.]



“In our industry, and in the waste industry as a whole, fires are becoming more prevalent.”

-Mark Harlacker –
Covanta's
Commercial Business
Director for Mid-
Atlantic Region,
4/26/2017 testimony
before DC City
Council



INCINERATOR FIRE

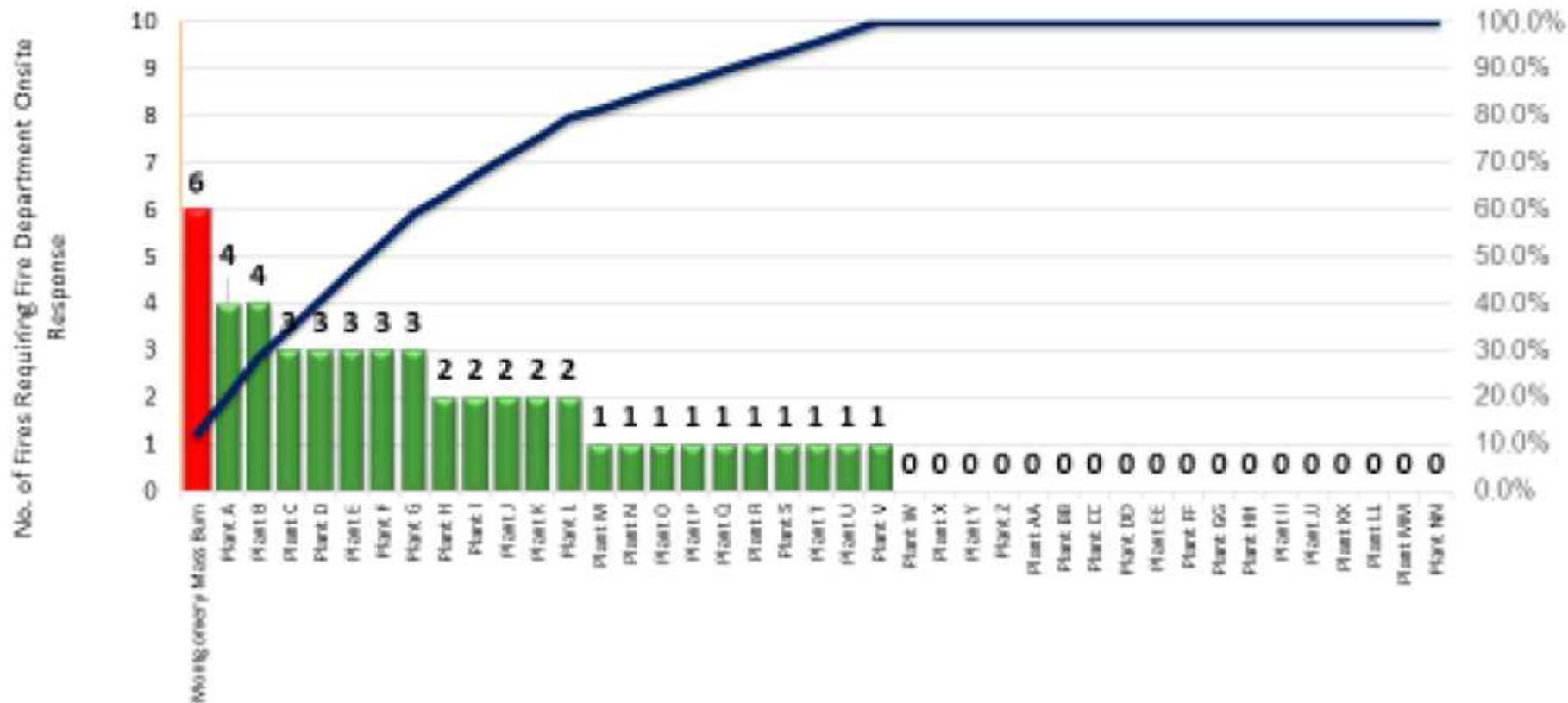
6:32 34°



Follow TAG @NBCWASHINGTON ON YOUR INSTAGRAM PHOTOS

Covanta Mass Burn 5 Year Fire History

No. of Fires Requiring Fire Department Onsite Response



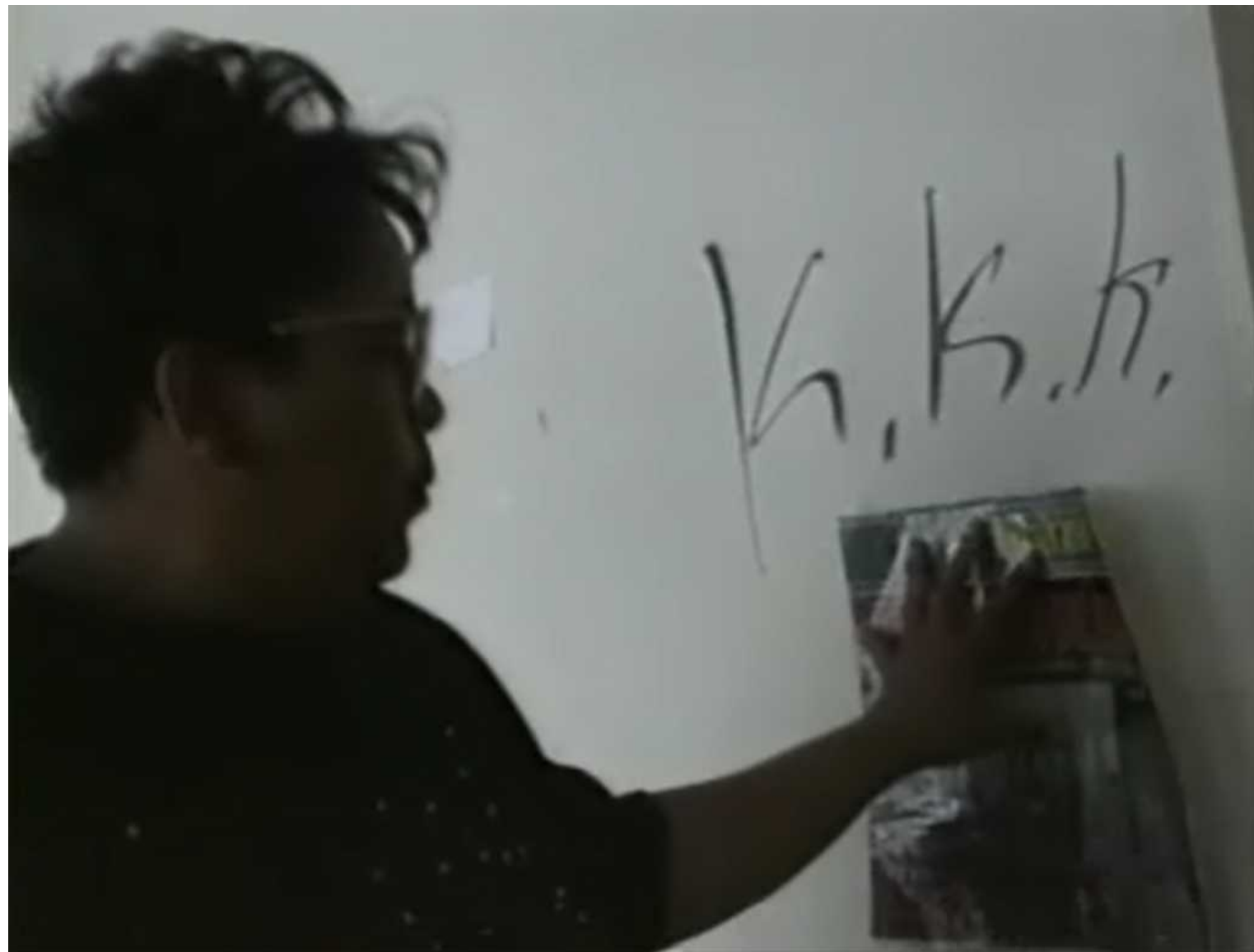
Trash Incinerator Health Impacts



Trash Incinerator Health Impacts

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

Racism isn't usually this obvious...

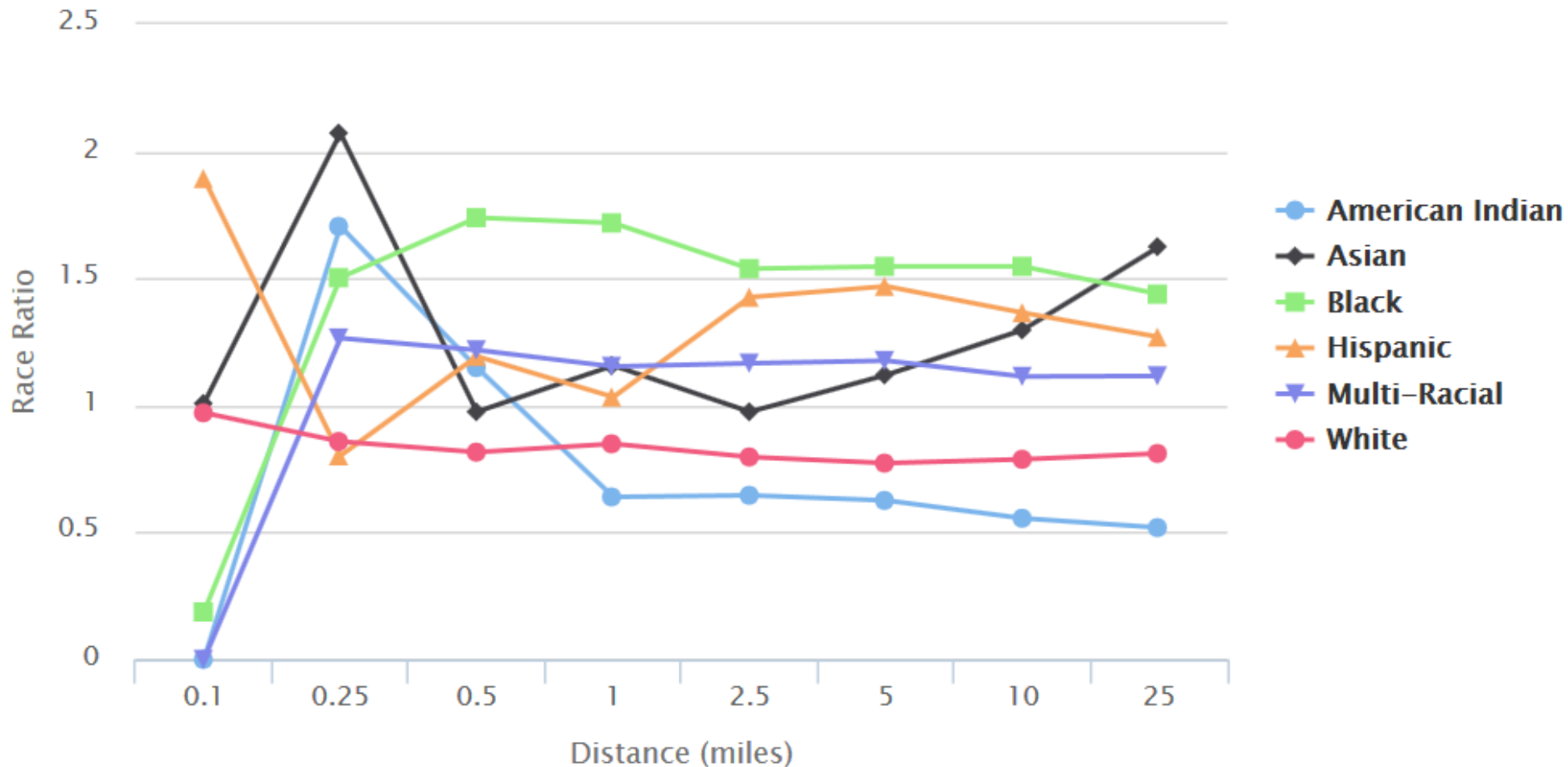


Zulene Mayfield shows signs of vandalism at office of Chester Residents Concerned for Quality Living in Chester, PA in 1996 "Laid to Waste" documentary.

Who Lives Near Trash Incinerators?

Ratio of Percent Race to US Median vs Distance

Powered by: JusticeMap.org, Census Data, and Energy Justice

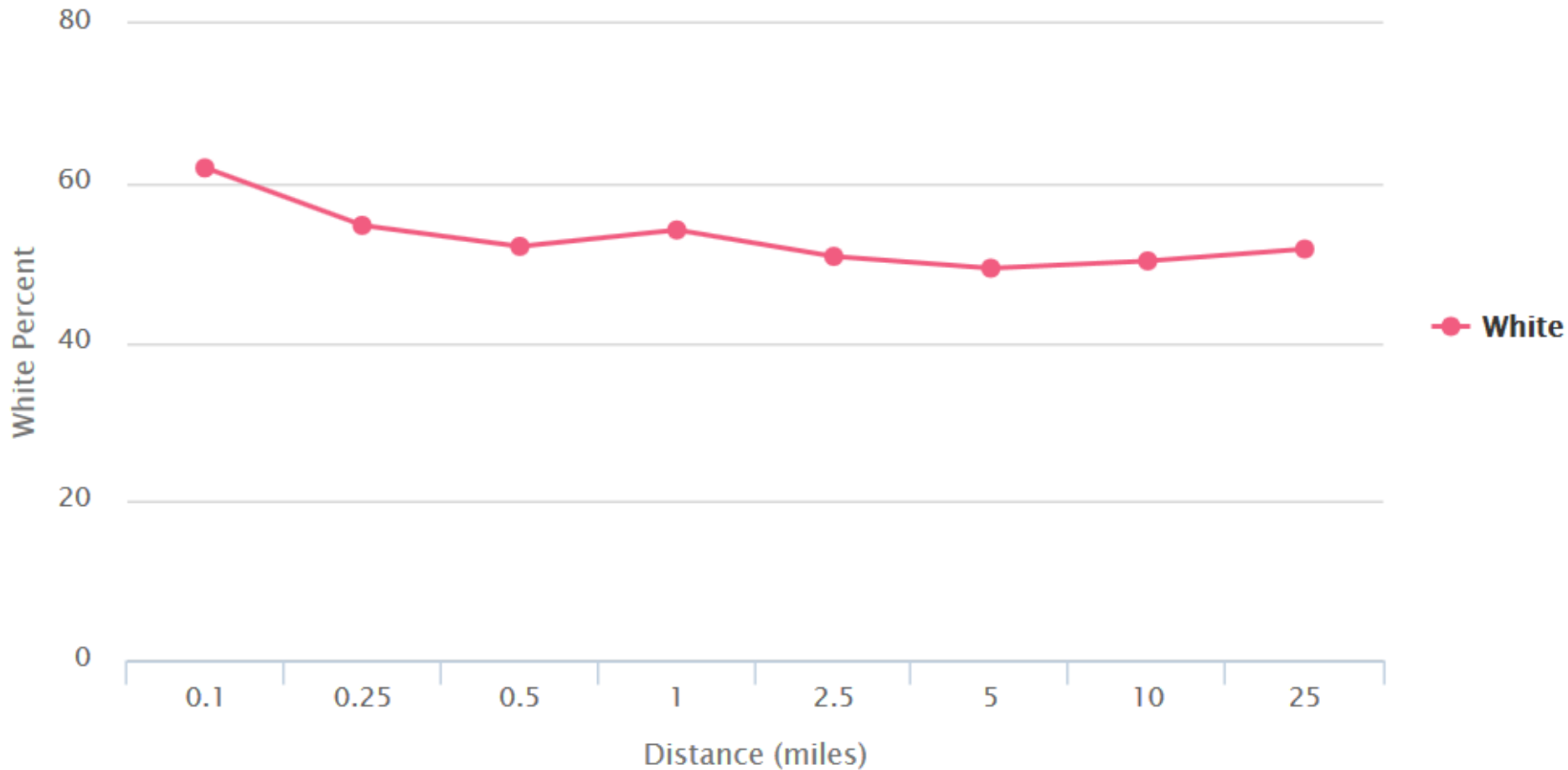


Who Lives Near Trash Incinerators?

Percent White vs Distance



Powered by: JusticeMap.org, Census Data, and Energy Justice



Zero Waste Jobs



Deconstruction Crew, Second Chance, Baltimore, MD. Photo Credit: C. Seldman

What is Zero Waste?

“Zero Waste is a goal that is ethical, economical, efficient and visionary, to guide people in changing their lifestyles and practices to emulate sustainable natural cycles, where all discarded materials are designed to become resources for others to use.

Zero Waste means designing and managing products and processes to systematically avoid and eliminate the volume and toxicity of waste and materials, conserve and recover all resources, and not burn or bury them.

Implementing Zero Waste will eliminate all discharges to land, water or air that are a threat to planetary, human, animal or plant health.”

If you're not for Zero Waste, how much waste are you for?

Zero waste is recognized as achieving 90% or greater diversion from landfills and incinerators.

The goal is to get as close to zero as possible, without getting caught up on the impossibility of actually hitting zero.

“Zero waste” is like “zero drug tolerance” or “zero accidents in the workplace” standards. Zero is the goal, and the right policies will get you as close as you can get.



Jan



Apr



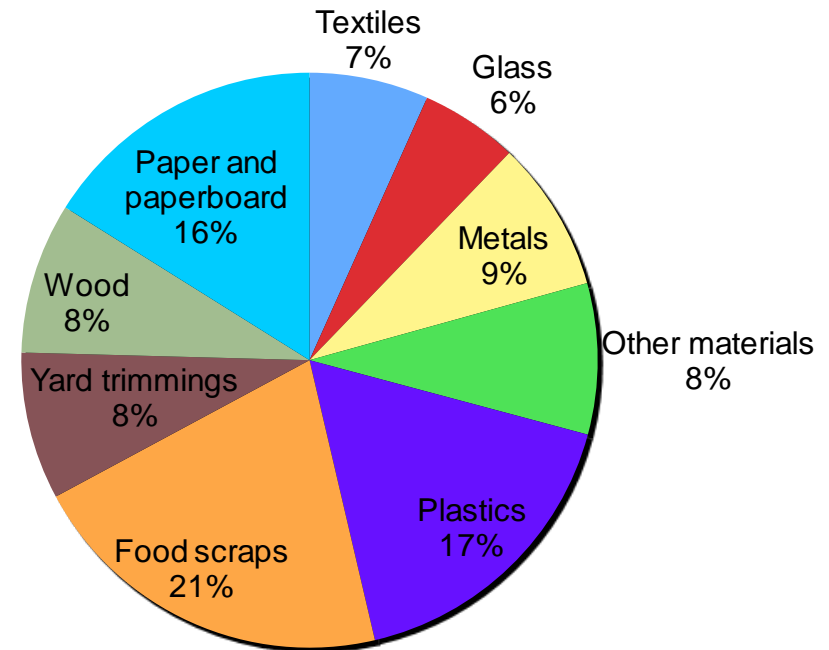
Jul



Oct

Money Thrown Away

\$11.4 billion worth of recyclable packaging wasted (sent to landfills and incinerators) in 2010



Source: “Unfinished Business: The Case for Extended Producer Responsibility,” 2012 Report, www.asyouow.org/sustainability/eprreport.shtml



AUSTIN RESOURCE RECOVERY MASTER PLAN

DECEMBER 15, 2011



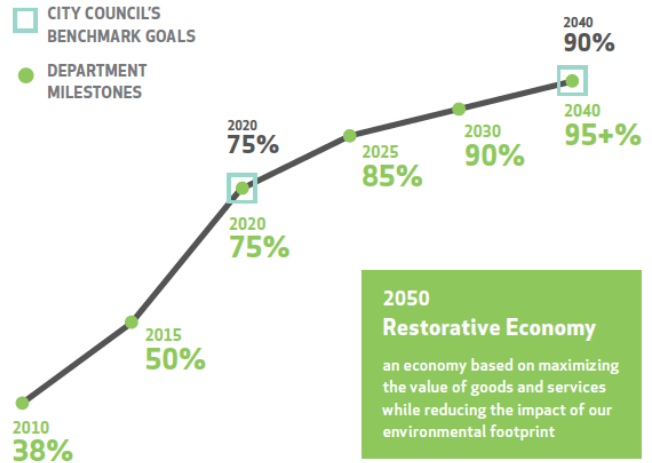
ZERO WASTE BY 2040

The Austin City Council established three benchmark goals for achieving Zero Waste:

- 1** Reducing by 20 percent the per capita solid waste disposed to landfills by 2012
- 2** Diverting 75 percent of solid waste from landfills and incinerators by 2020
- 3** Diverting 90 percent of solid waste from landfills and incinerators by 2040

DIVERSION GOALS

The Master Plan establishes more aggressive milestones to ensure the City Council's benchmark goals are achieved.



4

Table 1 - Projected Department Hauled Material Collection

Department Hauled Collection	In Tons				
	FY 2010 (Actual)	FY 2015	FY 2020	FY 2025	FY 2030
Total waste disposal	138,757	115,000	68,000	49,000	37,000
Total diversion: reuse, recycling, organics, HHW	82,611	115,000	205,000	277,250	332,000
Total waste generation	221,368	230,000	273,000	326,250	369,000
Diversion rate	38%	50%	75%	85%	90%



THE ZERO WASTE HIERARCHY

RETHINK/REDESIGN

REDUCE

REUSE

RECYCLE/COMPOST

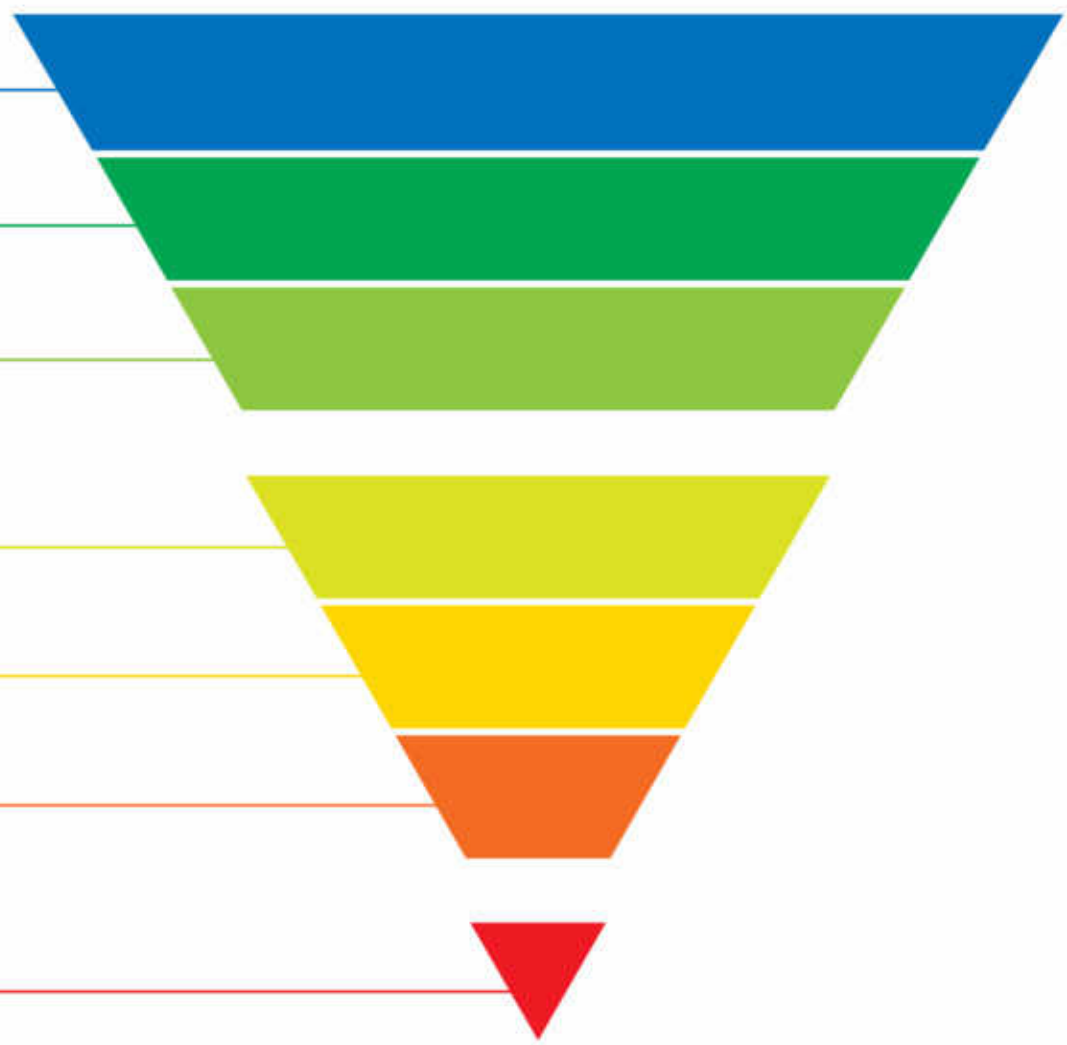
MATERIAL RECOVERY

RESIDUALS MANAGEMENT

(Biological treatment and stabilized landfilling)

UNACCEPTABLE

(Waste deregulation, incineration, and "waste-to-energy")



Zero Waste Hierarchy

- Rethink / Redesign
- Reduce
- Source Separate:
 - Reusables
 - Recycle (multi-stream)
 - Compost
 - Waste
 - **Research** to see what is left, and encourage redesign
 - **Recovery**: mechanically remove additional recyclables
 - Anaerobically digest, then aerobically compost residuals
 - Stabilized (digested) residuals to landfill

The back end is still a landfill...

1. Direct landfilling
(bad, but better than incineration)
2. Incineration → toxic ash to landfill
(most polluting and expensive option)
3. Anaerobic digestion → landfill
(best option, economically and environmentally; avoids having gassy, stinky landfills)



Impacts of Each Major Option

1. Direct landfilling

leachate (toxins)

air emissions (toxins, methane, odors)

2. Incineration → toxic ash to landfill


leachate (even more toxins)

air emissions from ash blowing off site
(toxins)

3. Anaerobic digestion → landfill

odor, leachate and air emissions highly
minimized





Why Local Ordinances?

- smaller level more easily influenced
 - best in municipalities; many states don't have them
- keeps the fight where the community people power is
 - keeps it political
- play by own rules
- inexpensive
- legal bills socialized
 - legal liability insurance

www.energyjustice.net/ordinances

Clean Air Act and State/Local Government Authority

§ 7416. 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 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.

Clean Air Act and State/Local Government Authority

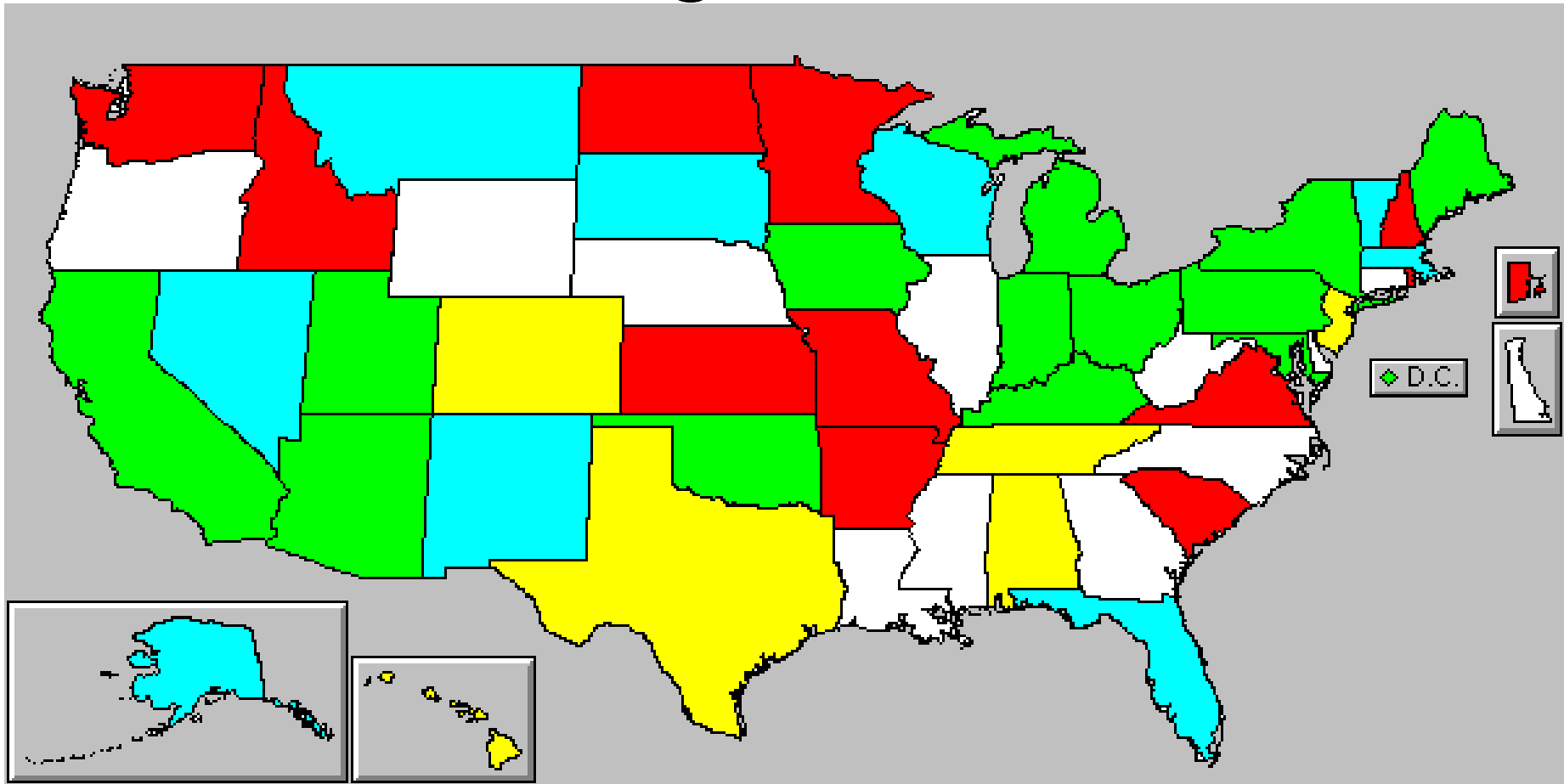
U.S. District Court, in *Rhode Island Cogeneration Associates v. East Providence*, 728 F. Supp. 828, 833 n.11 (1990):

[T]he congressional finding that state and local governments should have primary responsibility for controlling air pollution (42 U.S.C. § 7401(a)), is not a grant of power to local governments. Local governments are subordinate to the states; any grants of authority must come from the state legislatures, not from Congress. Thus, this Court does not need to examine the federal law for the purposes of this decision, and will concentrate on Rhode Island's laws and regulations governing air pollution. If the state has preempted East Providence's Ordinance, its validity cannot be saved by a grant of authority from Congress.

This unfortunate conclusion was reaffirmed in the 6th Circuit in 1993, when they stated that “nowhere does the CAA affirmatively grant local governments the independent power to regulate air pollution.”

- *Southeastern Oakland County Resource Recovery Auth. v. City of Madison Heights*, 5 F.3d 166, 169 (1993).

State-to-Local Air Pollution Savings Clauses



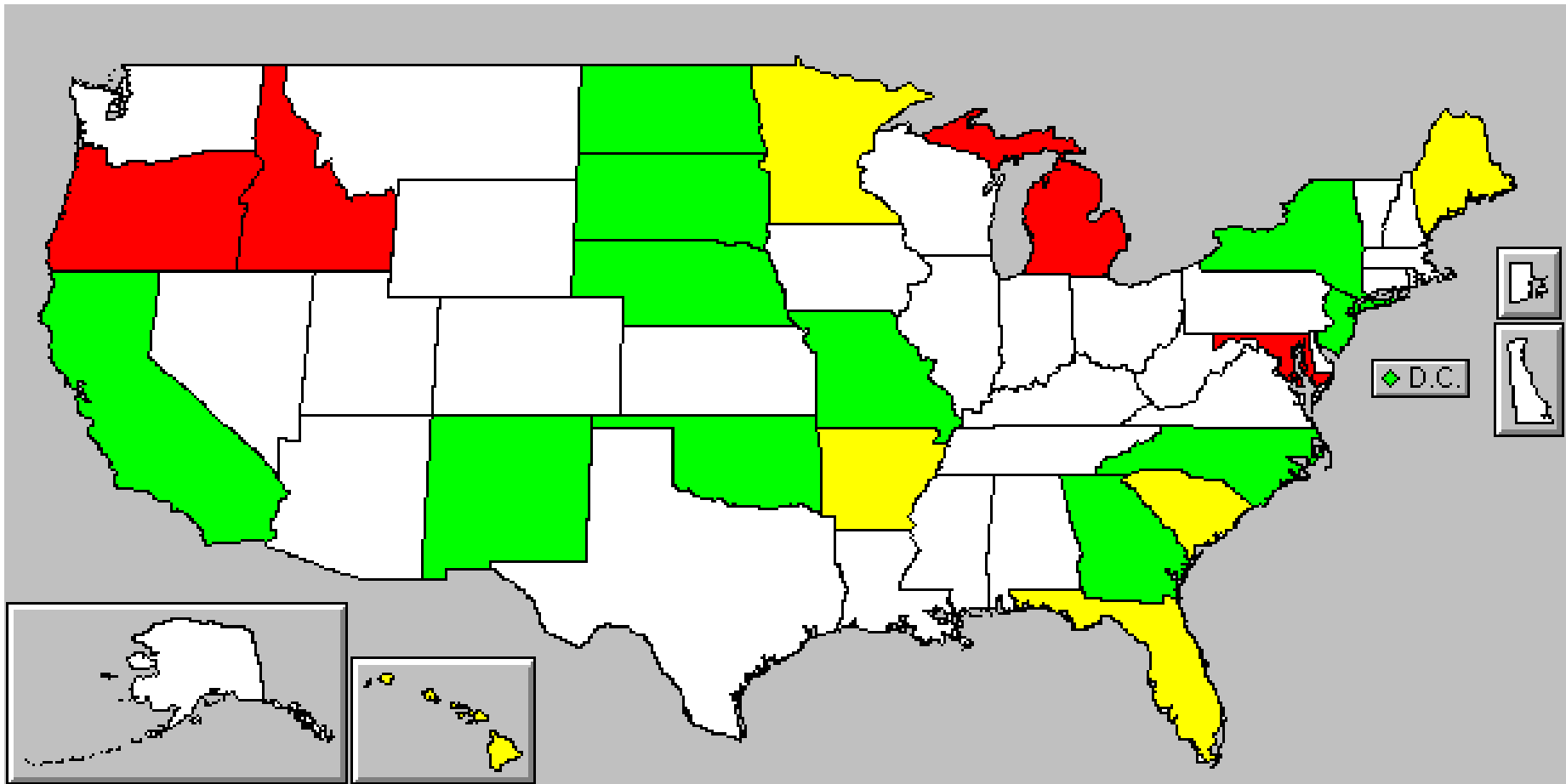
Green = Local laws allowed

Yellow = In-between (allowed only in certain areas or subject to state approval)

Red = Local laws preempted

Blue = Local air regulation *programs* allowed

State-to-Local Municipal Solid Waste (MSW) Savings Clauses



Green = Local laws allowed

Red = Local laws preempted

Yellow = In-between (allowed only in certain areas or subject to state approval)

Clean Air Ordinance Design

- Continuous Emissions Monitoring for nearly 20 dangerous air pollutants
- Real-time disclosure of emissions data on a public website
- Strict emissions limits and air pollution control requirements

For more Info...

- Incineration:
 - www.EnergyJustice.net/incineration
 - www.EnergyJustice.net/biomass
 - www.EnergyJustice.net/tires
 - www.no-burn.org
 - www.GreenAction.org
- Landfills and Landfill Gas Burning:
 - www.EnergyJustice.net/lfg
 - www.ejnet.org/landfills
 - www.beyondlandfilling.org
- Zero Waste:
 - www.EnergyJustice.net/zerowaste
 - www.ilsr.org/initiatives/waste-to-wealth
 - www.grrn.org/zerowaste
 - www.zwia.org



www.EnergyJustice.net

Mike Ewall, Esq.
Founder & Director
215-436-9511
mike@energyjustice.net