



## Incinerators: Myths vs. Facts about “Waste to Energy”

**INCINERATION** is a waste treatment technology that involves burning commercial, residential and hazardous waste. Incineration converts discarded materials, including paper, plastics, metals and food scraps into bottom ash, fly ash, combustion gases, air pollutants, wastewater, wastewater treatment sludge and heat. There are 113 waste incinerators in the U.S. and 86 of these are used to generate electricity. No new incinerators have been built in the U.S. after 1997, due to public opposition, identified health risks, high costs, and the increase of practices such as recycling and composting. In recent years, the incinerator industry has tried to expand their sector by marketing their facilities as “Waste to Energy” (WTE), using misleading claims.

**MYTH 1: Waste incineration is a source of renewable energy.**

**FACT: 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 in order to generate electricity creates a demand for “waste” and discourages much-needed efforts to conserve resources, reduce packaging and waste and encourage recycling and composting. More than 90% of materials currently disposed of in incinerators and landfills can be reused, recycled and composted.<sup>1</sup> Providing subsidies or incentives for incineration encourages local governments to destroy these materials, rather than investing in environmentally sound and energy conserving practices such as recycling and composting.

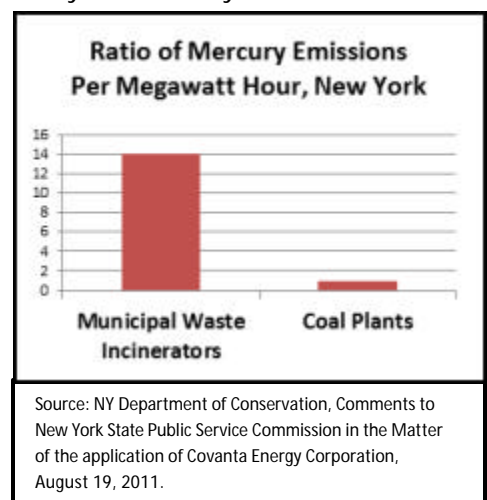
**MYTH 2: Modern incinerators have pollution control devices such as filters and scrubbers that make them safe for communities.**

**FACT: All incinerators pose considerable risk to the health and environment of neighboring communities as well as that of the general population.** Even the most technologically advanced incinerators release thousands of pollutants that contaminate our air, soil and water. Many of these pollutants enter the food supply and concentrate up through the food chain. Incinerator workers and people living near incinerators are particularly at high risk of exposure to dioxin and other contaminants.<sup>2</sup> A recent study published in the *American Economic Review* found that among U.S. industries, the waste incineration industry has the highest ratio of negative economic impacts from air pollution compared to the financial value added by the industry.<sup>3</sup>

The New York Department of Conservation found that the state’s incinerators emit up to 14 times more mercury as coal-fired power plants per unit of energy. In 2009, New York incinerators emitted a total of 36% more mercury than its coal plans.

**Trash incineration releases 28 times as much dioxin per unit of energy than coal, twice as much carbon monoxide, 3.2 times as much nitrogen oxides (NOx), 14 times as much mercury, nearly six times as much lead and 20% more sulfur dioxides.**<sup>4</sup>

In newer incinerators, air pollution control devices such as air filters capture and concentrate some of the pollutants; but they don’t eliminate them. The captured pollutants are transferred to other by-products such as fly ash, bottom ash, boiler ash/ slag, and wastewater treatment sludge that are then released into the environment.<sup>5</sup> However, even modern pollution control devices such as air filters do not prevent the escape of many hazardous emissions such as ultra-fine particles.<sup>6</sup> Ultra-fine particles are particles produced



from burning materials (including PCBs, dioxins and furans), which are smaller in size than what is currently regulated or monitored by the U.S. EPA. These particles can be lethal, causing cancer, heart attacks, strokes, asthma, and pulmonary disease. It is estimated that airborne particulates cause the deaths of over 2 million people worldwide each year.<sup>7</sup> In the U.S. communities of color, low-income communities, and indigenous communities are exposed to a disproportionate burden of such toxins.<sup>8</sup>

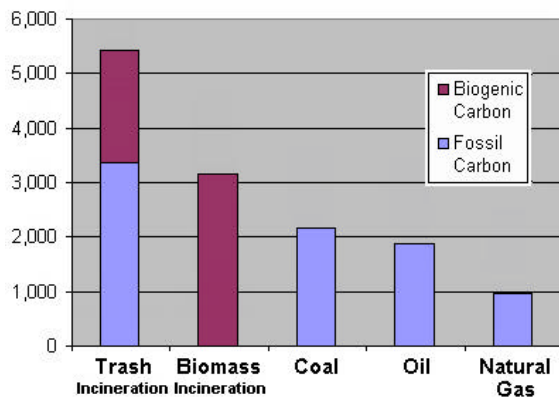
Finally, U.S. regulatory agencies have found that incinerators are prone to various types of malfunctions, system failures and breakdowns, which routinely lead to serious air pollution control problems and increased emissions that are dangerous to public health.<sup>9</sup>

**MYTH 3: Incinerators are a solution to climate change.**

**FACT: Burning waste is worse than coal for climate change.**

Incinerators emit more 2.5 times more carbon dioxide (CO<sub>2</sub>) per unit of electricity (5,420 lbs/MWh) than coal-fired power plants. (2,167 lbs/MWh) and 55% more if you pretend that the biogenic<sup>10</sup> part doesn't count.<sup>11</sup> Biomass incineration is nearly 50% worse than coal. According to the U.S. EPA, "waste to energy" incinerators and landfills contribute far higher levels of greenhouse gas emissions and overall energy throughout their lifecycles than source reduction, reuse and recycling of the same materials.<sup>12</sup> Incineration also drives a climate changing cycle of new resources pulled out of the earth, processed in factories, shipped around the world, and then wasted in incinerators and landfills.

**CO2 Emissions from U.S. Electric Power Plants**  
in pounds of carbon pollution per unit of energy produced (lbs/MWh)



Source: U.S. EPA eGRID 2012 Database  
Analysis by Energy Justice Network, www.EnergyJustice.net

Denmark—the poster child of Europe’s incinerator industry—recently discovered that its incinerators were releasing double the quantity of carbon dioxide than originally estimated, and had probably been doing so for years, causing Denmark to miss its Kyoto Protocol GHG reduction targets.<sup>13</sup>

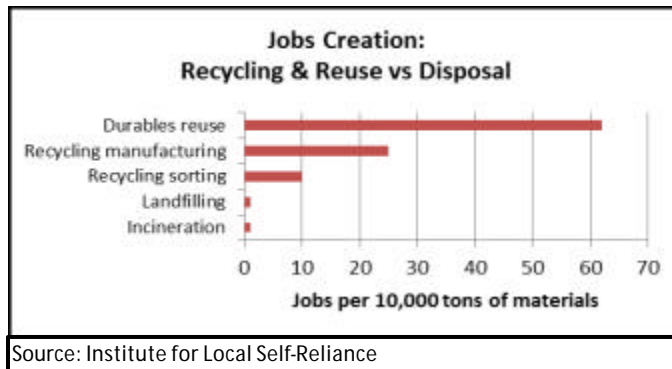
In contrast, a 2009 study by the EPA concluded that up to 42% of U.S. GHG emissions could be impacted through zero waste strategies such as recycling and composting.<sup>14</sup>

**MYTH 4: Modern incinerators efficiently produce electricity.**

**FACT: All incinerators are a massive waste of energy.** Due to the low calorific value of waste, **incinerators are only able to make small amounts of energy** while destroying large amounts of reusable materials. While older incinerators generate electricity at very low efficiency rates of 19-27%, a recent UK study<sup>15</sup> found that conversion efficiencies of new incineration technologies are even lower. Conversely, zero waste practices such as recycling and composting serve to conserve three to five times the amount of energy produced by waste incineration.<sup>16</sup> The amount of energy wasted in the U.S. by not recycling aluminum and steel cans, paper, printed materials, glass, and plastic is equal to the annual output of 15 medium-sized power plants.<sup>17</sup>

**MYTH 5: Incinerators provide jobs.**

**FACT: Recycling creates 10-20 times more jobs than incinerators.** Incinerators require huge capital investment, but offer relatively few jobs when compared to recycling. 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.**<sup>18</sup>



Source: Institute for Local Self-Reliance

## **MYTH 6: Incinerators are an affordable option.**

**FACT: Incinerators are the most expensive method to generate energy and to handle waste, while also creating significant economic burdens for host cities.** According to the U.S. Energy Information Administration Annual Energy Outlook 2010, the projected capital cost of new waste incinerator facilities is \$8,232 per kilowatt hour. That is twice the cost of coal-fired power and 60 percent more than nuclear energy. Waste incinerator operations and maintenance costs are ten times greater than coal and four times greater than nuclear.<sup>19</sup>

Billions of taxpayer dollars are spent subsidizing the construction and operations of incinerators. In 2011, Harrisburg, PA became the largest U.S. city to declare bankruptcy, and the financial blame rests squarely on the shoulders of its staggering debt payments for upgrades at the city's incinerator.<sup>20</sup> Detroit taxpayers have spent over \$1.2 billion dollars in debt service payments from constructing and upgrading the world's largest waste incinerator.<sup>21</sup> As a result, residents have had to pay high trash disposal fees of over \$150 per ton. The city could have saved over \$55 million in just one year if it had never built the incinerator. For a fraction of these costs, investments in recycling, reuse and remanufacturing would create significantly more business and employment opportunities.<sup>22</sup>

## **MYTH 7: Incinerators are compatible with recycling.**

**FACT: Incinerators burn many valuable resources that can be recycled and composted,** and incinerators compete for the same materials as recycling programs. Because of the extremely high costs of constructing and operating an incinerator, spending taxpayer money for an incinerator means that there are significantly less funds to invest in more affordable solutions. More than two thirds of the materials we use are still burned or buried,<sup>23</sup> despite the fact that we can cost-effectively recycle the vast majority of what we waste.

## **MYTH 8: Countries like Denmark that are expanding incineration have the highest recycling rates and they only burn materials that cannot be recycled.**

**FACT: Countries and regions in Europe that have high waste incineration rates typically recycle less.** Data for household waste from Denmark in 2005 clearly shows that regions with expanded incineration have lower recycling and regions with lower incineration do more recycling.<sup>24</sup> It's worth noting that Denmark's recycling rate is well behind other regions of Europe such as Flanders in Belgium, which recycles 71% of municipal waste.

Regions of Denmark	Recycling	Incineration	Landfill
Hovedstaden	21%	77%	2%
Nordjylland	29%	63%	8%
Sjælland	31%	59%	10%
Midtjylland	40%	53%	7%
Syddanmark	41%	52%	6%

According to Eurostat in 2007, Denmark generates some of the highest per capita waste in the EU (over 1762 lbs. each year) and over 80% of what is burned in Danish incinerators is recyclable and compostable. A 2009 study reported that Europe throws away resources worth over \$6 billion dollars every year by burning and burying materials that can be recycled.<sup>25</sup>

## **MYTH 9: Modern European incinerators produce clean energy, less pollution**

**FACT: Waste incinerators in the EU continue to pollute the climate and cause significant public health risk,** while burning billions of dollars-worth of valuable, non-renewable resources. A recent public health impacts report<sup>26</sup> states that modern incinerators in the EU are a major source of ultra-fine particulate emissions. In 2009, the Advertising Standards Agency in the UK banned the SITA Cornwall waste company from distributing its booklet on incineration for, among other things, making unsubstantiated claims that the UK Health Protection Agency stated that modern incinerators are safe.<sup>27</sup>

## MYTH 10: The EU is way ahead, and the U.S. lags behind in waste reduction.

**FACT: U.S. communities have been pioneers in the field of Zero Waste, as have many communities in Europe that prioritize zero waste above incineration**, while many EU countries are ahead of the U.S. in terms of national programs such as healthcare and climate change mitigation. Zero Waste is *the design and management of products and processes to reduce the volume and toxicity of waste and materials, conserve and recover all resources, and not burn or bury them.*<sup>28</sup> Americans can be proud of some of the benchmarks we have achieved in reducing waste through Zero Waste strategies:

- The Commonwealth of Massachusetts<sup>29</sup> and the States of Rhode Island, Delaware and California have banned or seriously restricted new waste incinerators, in favor of Zero Waste practices and policies.
- Massachusetts, California,<sup>30</sup> Wisconsin<sup>31</sup> and Washington<sup>32</sup> prioritize Zero Waste practices and policies.
- The U.S. has led the world in the implementation of curbside recycling programs, with more communities (40+) committed to Zero Waste goals than all of Europe, including the cities of Oakland (CA), Los Angeles (CA), Seattle (WA) and Austin (TX).
- The city of San Francisco<sup>33</sup> has achieved a 75% recycling rate of all municipal and commercial waste, aims to get to Zero Waste by the year 2020, and has created over 1000 local jobs in the sector.

### ENDNOTES

<sup>1</sup> Platt, Brenda et al, Stop Trashing the Climate, ILSR, Eco-Cycle & GAIA, 2008.

<sup>2</sup> Waste Incineration and Public Health (2000), Committee on Health Effects of Waste Incineration, Board on Environmental Studies and Toxicology, Commission on Life Sciences, National Research Council, National Academy Press, pp. 6-7.

<sup>3</sup> Muller, Nicholas Z., Robert Mendelsohn, and William Nordhaus. 2011. "Environmental Accounting for Pollution in the United States Economy." *American Economic Review*, 101(5): 1649-75.

<sup>4</sup> eGRID 2012 database, U.S. EPA, <http://www.epa.gov/egrid/>; "An Inventory of Sources and Environmental Releases of Dioxin-Like Compounds in the U.S. for the Years 1987, 1995, and 2000," Table ES-2, p. xlvi, U.S. Environmental Protection Agency, Nov 2006.

<http://cfpub.epa.gov/ncea/CFM/recorderdisplay.cfm?deid=159286> (and 2005 updates on MSW incinerator emissions); "Waste-To-Energy: Dirtying Maryland's Air by Seeking a Quick Fix on Renewable Energy?" Environmental Integrity Project, Oct. 2011.

<http://www.environmentalintegrity.org/documents/FINALWTEINCINERATORREPORT-101111.pdf>

<sup>5</sup> Römbke, J., et al. Ecotoxicological characterisation of 12 incineration ashes using 6 laboratory tests. *Waste Management*, 2009.

<sup>6</sup> Howard, C. Vyvyan, Statement of Evidence, Particulate Emissions and Health, Proposed Ringaskiddy Waste-to-Energy Facility, June 2009.

<sup>7</sup> *Ibid.*

<sup>8</sup> Mohai, Paul, "Reassessing Racial and Socioeconomic Disparities in Environmental Justice Research," 2006, *Demography*, 43 (2), 383-399.

<sup>9</sup> Massachusetts Department of Environment citations for violations by Covanta Haverhill Incinerator:

[http://www.cicw.org/notice/Covanta\\_Massachusetts\\_environmental\\_violations.pdf](http://www.cicw.org/notice/Covanta_Massachusetts_environmental_violations.pdf)

<sup>10</sup> The "biogenic doesn't count" ("carbon neutrality") argument relies on the assumption that the extra pulse of carbon pollution is instantly sucked up by trees grown specifically to offset the emissions from the trees burned. In reality, it takes centuries to become "zero" and about 40 years for biomass to become only as bad as coal. That figure, from a study done for the Commonwealth of Massachusetts, caused that state to adopt the strictest limits on biomass incineration in the nation, making it basically ineligible for renewable energy credits. Studies at: <http://www.energyjustice.net/biomass/>

<sup>11</sup> eGRID 2012 database, U.S. EPA, <http://www.epa.gov/egrid/>

<sup>12</sup> U.S. EPA, "Solid Waste Management and Greenhouse Gases, A Life-Cycle Assessment of Emissions and Sinks 3<sup>rd</sup> edition," 2006.

<sup>13</sup> Buley, Jennifer, "Plastic Surgery for Copenhagen's Recycling Policy," *The Copenhagen Post*, April 14, 2011. <http://www.no-burn.org/plastic-surgery-for-copenhagens-recycling-policy>.

<sup>14</sup> U.S. EPA, Opportunities to Reduce Greenhouse Gas Emissions through Materials and Land Management Practices, 2009.

<sup>15</sup> Fichtner Consulting Engineers Limited, The Viability of Advanced Thermal Treatment in the UK, 2004, p. 4.

<sup>16</sup> Morris, Jeffrey, Comparative LCAs for Curbside Recycling Versus Either Landfilling or Incineration with Energy Recovery, *The International Journal of Life Cycle Assessment*, July 2005. Available at: <http://www.springerlink.com/content/m423181w2hh036n4/>

<sup>17</sup> U.S. Senate. Bill S. 3654 [109th]: Recycling Investment Saves Energy. Introduced July 13, 2006.

<sup>18</sup> Tellus Institute, *More Jobs, Less Pollution: Growing the Recycling Economy in the United States*, 2011. [www.recyclingworkscampaign.org](http://www.recyclingworkscampaign.org)

<sup>19</sup> U.S. Energy Information Administration (Department of Energy), Updated Capital Cost Estimates for Electricity Generation Plants, November 2010. [http://www.eia.gov/oiaf/beck\\_plantcosts/pdf/updatedplantcosts.pdf](http://www.eia.gov/oiaf/beck_plantcosts/pdf/updatedplantcosts.pdf)

<sup>20</sup> Lewis, Al, Don't trash my city, Harrisburg activist warned, *Market Watch*, October 19, 2011, [http://www.marketwatch.com/story/dont-trash-my-city-harrisburg-activist-warned-2011-10-19?reflink=MW\\_news\\_stmp](http://www.marketwatch.com/story/dont-trash-my-city-harrisburg-activist-warned-2011-10-19?reflink=MW_news_stmp)

<sup>21</sup> Guyette, Curt, Fired Up: Detroit Incinerator's Long Simmering Opposition, *Detroit Metro Times*, April 2008.

<http://www.metrotimes.com/editorial/story.asp?id=12748>

<sup>22</sup> Seldman, Neil, Recycling First -Directing Federal Stimulus Money to Real Green Projects, *E Magazine*, 2008.

<sup>23</sup> U.S. EPA, 2006 MSW Characterization Data Tables, "Table 29, Generation, Materials Recovery, Composting, Combustion, and Discards Of Municipal Solid Waste, 1960 To 2006," Franklin Associates, A Division of ERG. [www.epa.gov/garbage/msw99.htm](http://www.epa.gov/garbage/msw99.htm)

<sup>24</sup> Data from Waste Centre Denmark, 2005 data for household waste, Storage for incineration classified with incineration.

<sup>25</sup> Friends of the Earth Europe, Gone to waste – the valuable resources that European countries bury and burn, October 2009.

<sup>26</sup> Howard, C. Vyvyan, Statement of Evidence, Particulate Emissions and Health, Proposed Ringaskiddy Waste-to-Energy Facility, June 2009

<sup>27</sup> UK Without Incineration Network: Burner Booklet Banned, July 2009: <http://ukwin.org.uk/>

<sup>28</sup> Zero Waste International Alliance: <http://www.zwia.org/standards.html>

<sup>29</sup> Massachusetts Department of Environmental Protection, [Patrick-Murray Administration Maintains Incinerator Moratorium, Expands Recycling Efforts](http://www.mass.gov/dep/press/2009/12/11/2009-12-11-01.htm), press release, 12/11/2009.

<sup>30</sup> <http://www.calrecycle.ca.gov/Archive/IWMBPlans/2001/Goals.htm>

<sup>31</sup> <http://www.wnrmag.com/org/aw/wm/vision/futureofwaste.pdf>

<sup>32</sup> <http://www.ecy.wa.gov/beyondwaste/>

<sup>33</sup> Newsome, Gavin and Morales, Bob, [Don't talk trash – compost, recycle, create jobs instead](http://www.sacbee.com/news/local/article111111111.html), *Sacramento Bee*, 12/20/2009.