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Chairwoman Anne M. Gobi
Joint Committee on Environment, Natural Resources and Agriculture
State House, Room 473F, Boston, MA 02133

Chairman Marc R. Pacheco
Joint Committee on Environment, Natural Resources and Agriculture
State House, Room 312B, Boston, MA 02133

**Testimony of the Massachusetts Sierra Club in Support of H.706/S.1004, and
H.742: Bills Concerning the Incineration of Solid Waste**

Attachment: GAIA: Incinerator Myths and Facts.

Dear Chairwoman Gobi, Chairman Pacheco, and Honorable Members of the Committee:

Thank you for the opportunity to offer our comments on H.706/S.1004 and H.742. H.706/S.1004 calls for a ban on permitting new sites or expanding existing facilities for the incineration of solid waste, as well as providing an ultimate end to incineration in the Commonwealth by 2024. The Sierra Club strongly supports this legislation not only because of the health benefits it promises through cleaner air, water, and soil, but also because better options for managing solid waste already exist. The Sierra Club strongly supports H706/S.1004.

The Sierra Club is the oldest and largest grassroots non-profit and non-partisan environmental organization in the country, with over 1.4 million members and supporters nationwide. Its chapter in Massachusetts has over 22,000 members throughout the state and a history of protecting the environment that spans more than forty years. We work to create healthy, vibrant communities through support of clean air and water; clean energy; recycling and waste-elimination; and the preservation of the Commonwealth's most treasured forests, parks and open spaces.

To better understand the need for the present bill, it is necessary to consider the state of solid waste management. Municipal solid waste (MSW) can be divided into waste from local residents, businesses, and institutions; organic material (food, leaves, grass etc.) and products and packaging. MSW in Massachusetts is managed through fourteen landfills, seven waste combustors ("incinerators"), and various recycling and reuse facilities. As of 2009, the most recent year for which we have complete figures, Massachusetts produced 10.7 million tons of solid wastes, an average of about 9 pounds per day for each of the 6.55 million people who live here. Although this figure is 16% lower than 2000, the percentage of waste diverted through recycling, composting, and other reuse programs actually declined from 49% to 46% between 2000 and 2009.¹ Of similar concern is an uptick in incineration during this same period – from 3.07 to 3.18 million tons (about one-third of the state's MSW) – as waste sent to landfills and exported out of the state declined. These statistics suggest

that we are heading in the wrong direction for solid waste management in the Commonwealth despite having the infrastructure and technology in place to manage solid waste in safer and more cost-effective ways.²

Incinerators are an outdated waste management technology that is harmful to the environment and public health. These facilities burn trash at high temperatures (approximately 2,500°F), reducing its volume by about 90% and its weight by 75%. Over the past decade, emissions control systems at the five largest incinerators have been enhanced to comply with stronger federal and state solid waste and air regulations to protect public health, but major problems remain.³ Even incinerators with the most advanced technological safeguards – namely scrubbers and filters - still emit pollutants that contaminate the environment and harm the public. These emissions include acidic gases, chlorine-containing organic chemicals, heavy metals, and smog, which have been shown to increase the risk of cancer, reproductive and birth defects, and developmental disabilities.⁴ Many of these toxics are hazardous air pollutants (HAPs), a subject of another bill before the legislature (H.1944), that consist of “ultra-fine” particles which often escape capture, are not measured regularly, travel long-distances, and accumulate in humans and other organisms over time without dissipating.⁵ Incinerator facilities also produce toxic ash that must be buried in specially approved facilities.⁶ Burning trash is a lose-lose proposition that pollutes the air and harms the public while still requiring landfills for residual disposal.⁷

As the health costs of incinerators have become clearer, supporters of these facilities have altered their rhetoric by advancing dubious claims about their capacity for energy generation. At present, waste combustors produce 1.55% of the total winter season electricity in New England, a relatively small amount.⁸ The environmental costs of these facilities, however, far outweigh their energy generation potential. Total CO₂ emissions (the leading greenhouse gas responsible for global warming) for energy producing incinerators is 2,988 pounds/megawatt hour, higher than any other energy source including coal (2,249 pounds), oil (1,672 pounds), and natural gas (1,135 pounds).⁹ Moreover, energy production through incineration is quite inefficient at 19-27%, but sometimes even lower.¹⁰ Because of this, burning trash is more expensive than any other way to produce energy. According to the U.S. Energy Information Administration, the projected capital cost of new waste incinerator facilities is twice that of coal-fired power and 60% more expensive than nuclear energy. Waste incinerator operations and maintenance costs are also ten times greater than coal and four times greater than nuclear.¹¹ These costs are born by local communities, as incineration facilities often demand long-term contracts that will keep large amounts of trash flowing for decades.¹² In sum, incinerators have no net benefits for solid waste management or energy generation from either an economic or environmental perspective.

The uptick of incineration over the past several years undermines the gains that the Commonwealth has achieved in managing solid waste over the past two decades. Back in 1990, Massachusetts adopted its first master plan to manage solid waste, at which time it instituted a moratorium on new incineration capacity. At that time, nearly all of its trash was disposed of in landfills and incinerators, with very limited recycling and considerable troubles with pollution. Since that time, citizens, businesses, and government have worked together to recycle 46% of all waste, one of the best rates in the nation, while reducing pollution emissions from disposal facilities.¹³ In 2009, recycling prevented the disposal of nearly five million tons of waste, reduced greenhouse gas emissions by nearly 1.8 million tons, and saved 70 trillion Btu of energy (about 12 million barrels of oil).¹⁴ Because State and Federal laws call for updating solid waste master plans, the Massachusetts Department of Environmental Protection (DEP) started the process of revising the Solid Waste Master Plan (SWMP) in 2008 and finalized the plan for 2010-20 in 2013.

In December 2012, while the SWMP was still in draft form, MassDEP proposed a modification of the moratorium on additional waste combustors and reopened the comment period for the part of the plan dealing with the moratorium, which had been unchanged since

it was established in 1990. The purpose was to address a projected shortfall of 750,000 tons of solid waste management capacity associated with diminishing landfill capacity by allowing half of it to be dealt with through “innovative and alternative technologies” such as gasification, pyrolysis, and plasma heating that are supposed to convert solid waste into energy or fuel with lower levels of pollution and residuals than standard incineration.¹⁵

Despite their support from the DEP, these “alternative technologies” are just other names for burning trash. Basically, pyrolysis, gasification, and plasma technologies are thermal processes that use high temperatures to break down wastes into solids, liquids, and gases that can be combusted immediately or in a secondary process. Not only are these processes inefficient but they also release CO₂ and other contaminants associated with mass-burn incineration.

Incineration, and its low efficiency, is in direct opposition to our government’s efforts to stop the unnecessary and dangerous CO₂ emissions. In the words of President Barack Obama, “To reduce carbon pollution, I’ve directed the [EPA] to work with states and businesses to set new standards that put an end to the limitless dumping of carbon pollution from our power plants.”¹⁶

At present, we lack reliable data that these, alternative technologies are effective and operational at a large-scale; indeed, most of the data comes from companies in this industry looking to advance their interests. At present, there are no full-scale pyrolysis, gasification, or plasma facilities in the United States for municipal solid waste, and those in other countries are plagued with environmental, operational, and economic problems. Building these facilities requires expertise that is not well-developed, long lead times for planning and siting, and significant capital and long-term community investments in trash contracts that the original incinerator moratorium sought to combat in the first place. These alternative technologies for incineration are untested, unhealthy and unnecessary, and they do not represent a prudent means for managing solid waste in the Commonwealth, even as a stopgap measure.¹⁷

It does not make sense to keep burning trash when far better options for solid waste management exist. Research suggests that more than 90% of materials currently disposed of via incinerators and landfills can be recycled or reused.¹⁸ Thus, incineration facilities essentially compete with recycling and reuse facilities for materials.¹⁹ Moreover, recycling *conserves* three to five times as much energy as incinerator facilities generate after taking into account the fact that manufacturing new products from recycled materials uses less energy than products using virgin raw materials.²⁰ A major 2004 study in California confirms that recycling, including the cost of collecting, processing, and transporting recyclables to their end market, “consumes less energy and imposes lower environmental burdens than disposal of solid waste materials through landfilling or incineration, even after accounting for energy that may be recovered from waste materials at either type disposal facility.”²¹ Recycling and reuse also has a more positive economic impact than incineration. The Massachusetts DEP estimates that recycling and reuse activities create about 14,000 jobs and annual revenues of \$3.2 billion in the Commonwealth, far outpacing the benefits of incineration. Recycling and reuse create many times more jobs than landfilling or incineration.²² There are also major cost savings with reuse and recycling. The Mass DEP’s research suggests that reducing solid waste disposal by 2 million tons per year by 2020 would result in an annual savings of \$120 - \$160 million in disposal costs for residents and local communities.²³

The proposed legislation, H.706/S.1004, would ensure a cap on the Commonwealth’s incineration capacity at present levels. While it would not prohibit continued incineration of solid waste immediately, it would end permitting for such facilities by 2024. Detractors from the bill will argue that waste generation is expected to increase 2% per year for the next several years and that the decline of in-state landfill capacity from 2 million tons in 2010 to

600,000 tons by 2020 requires increasing the capacity for incineration.²⁴ This data, combined with the fact that recycling has stagnated over the past decade and that waste generation will likely go up as the national economy rebounds, may suggest that incineration with “alternative technologies” is the answer. It is not. Incineration represents an unsustainable, negligent reprieve from the long-term problem of municipal waste which requires thoughtful solutions. It also must be noted that we are currently burning waste from RI, CT, NY, VT, and NH. Even if we reduced our own waste generation to zero, as long as we have incinerators, there is nothing we can do to prevent out-of-state waste from coming in to feed them. For this reason, the moratorium on new facilities should remain in place, and Massachusetts should provide for an eventual end of this practice.

Modifying the incinerator moratorium runs counter to everything else in the Massachusetts DEP’s *Waste Master Plan for 2010-2020*. That plan, entitled “Pathway to Zero Waste” seeks to divert 20% more material from disposal to recycling and reuse by 2020 in order to reduce disposal costs and pollution emissions for local communities, conserve natural resources, enhance energy conservation, and support job creation at recycling centers, reuse facilities, and for businesses using material waste to make new products.²⁵ Given the economic benefits of resource conservation, burning trash equates to burning money. The Sierra Club is committed to bringing an end to this wasteful, myopic practice.

The key to solid waste management in the twenty-first century, in a world where we understand and appreciate the finite nature of resources, is “reduce, reuse, recycle.” Preventing the creation of waste in the first place is essential and can be achieved through intelligent and sagacious product design and packaging. Re-use of materials, particularly in the construction industry, holds a great deal of untapped potential in the Commonwealth. Making greater strides in recycling through increased financial investments will pay real dividends in cleaner air, less waste, and job creation. These principles, which serve as the foundation for a “zero-waste” system, require responsible policies and community programs.²⁶ The bill before you, in conjunction with an updated “bottle bill” and the “electronic waste bill”, provides a clear path forward for realizing the zero-waste Commonwealth that is reasonably within our grasps.²⁷

The Sierra Club fully supports H.706/S.1004 and hopes that this bill receives a favorable review by the committee and the state legislature as a whole. We strongly believe that it would significantly improve the health of Massachusetts’s residents by reducing air pollution from incineration while stimulating the economy by creating jobs through recycling and re-use of solid waste. It is time to shutter incinerators – a relic of a bygone age - and to continue moving forward in the pursuit of a zero waste and clean energy Commonwealth that best serves our present and future needs.

Testimony prepared with the assistance of John H. Spiers, Massachusetts Sierra Club Legislative Action Committee.

Respectfully,



Ryan Black
Director
Massachusetts Sierra Club

¹ The primary reason for the drop in MSW is the decline in construction and demolition debris associated with the economic recession of the past few years.

² Massachusetts Department of Environmental Protection (DEP), “How Much Solid Waste Does Massachusetts Produce,” *Waste & Recycling*, <http://www.mass.gov/dep/recycle/swgen.htm> (accessed March 28, 2013);

Massachusetts DEP, "What Happens to the Materials We Discard?" *Waste & Recycling*, <http://www.mass.gov/dep/recycle/swgo.htm> (accessed March 28, 2013).

³ Federal regulation of solid waste facilities comes primarily from the Clean Air Act. At the state level, there is a solid waste master plan that is updated every ten years. Standards for the siting and operations of solid waste facilities, including what materials they can and cannot accept, are codified in 310 CMR 16.00 and 19.00. In 2006, the state legislature passed the Mercury Management Act (310 CMR 74.00 and 75.00), which bans products containing mercury from entering the waste stream and requires producers to collect and recycle products with mercury. Massachusetts DEP, "How Solid Waste Is Regulated in Massachusetts," *Waste and Recycling*, <http://www.mass.gov/dep/recycle/swreg.htm> (accessed March 28, 2013); Massachusetts DEP, "Municipal Waste Combustors: Regulation & Monitoring," *Solid Waste Facilities*, <http://www.mass.gov/dep/recycle/solid/mwcremon.htm#2> (accessed March 28, 2013).

⁴ M.F. Reis, "Solid Waste Incinerators: Health Impacts," in *Encyclopedia of Environmental Health*, ed. Jerome O. Nriagu (Amsterdam, The Netherlands, 2011), 162-217, <http://www.sciencedirect.com/science/referenceworks/9780444522726>, cited in Eco-Cycle, *Waste-of-Energy: Why Incineration is Bad for Our Economy, Environment and Community* (Boulder, CO, 2011), 9, http://www.ecocycle.org/files/pdfs/WTE_wrong_for_environment_economy_community_by_Eco-Cycle.pdf (accessed March 28, 2013); Global Alliance for Incinerator Alternatives (GAIA), "Incinerators: Myths vs. Facts about 'Waste to Energy,' brochure (Berkeley, CA, 2012), <http://www.no-burn.org/article.php?id=1433> (accessed March 28, 2013); GAIA, *Incinerators Trash Community Health* (Berkeley, CA, 2008), <http://www.sierraclub.org/committees/zerowaste/downloads/incinerators.pdf> (accessed March 28, 2013). Studies cited include: Günter Oberdörster, Eva Oberdörster and Jan Oberdörster, "Nanotoxicology: An Emerging Discipline Evolving from Studies of Ultrafine Particles." *Environmental Health Perspectives* 113, no. 7 (July 2005): 823-839.

⁵ GAIA, *Incinerators Trash Community Health* (2008).

⁶ Massachusetts DEP, "About Municipal Waste Combustors," *Solid Waste Facilities*, <http://www.mass.gov/dep/recycle/solid/mwcaabout.htm> (accessed March 28, 2013).

⁷ It is important to note that dioxins are in the food chain and bio-accumulative. The Pittsfield incinerator was fined in 2008 for gross dioxin exceedances, about 350%.

⁸ Ibid, "Disposal Technologies Currently in Use," *Waste & Recycling*, <http://www.mass.gov/dep/recycle/swdisp.htm>

⁹ Environmental Protection Agency, *Clean Energy: Air Emissions* (Washington, DC, 2011), <http://www.epa.gov/cleanenergy/energy-and-you/affect/air-emissions.html>.

¹⁰ GAIA, "Incinerators: Myths vs. Facts about 'Waste to Energy.'"

¹¹ U.S. Energy Information Administration, Updated Capital Cost Estimates for Electricity Generation Plants, (Washington, DC, 2010), http://www.eia.gov/oiaf/beck_plantcosts/pdf/updatedplantcosts.pdf, cited in GAIA, "Incinerators: Myths vs. Facts."

¹² Massachusetts DEP, "Disposal Technologies Currently in Use," *Waste & Recycling*, <http://www.mass.gov/dep/recycle/swdisp.htm>

¹³ Ibid, "Solid Waste Management in Massachusetts," *Waste & Recycling*, <http://www.mass.gov/dep/recycle/swminma.htm> (accessed March 28, 2013).

¹⁴ Massachusetts DEP. Executive Office of Energy and Environmental Affairs, *Pathway to Zero Waste: Massachusetts 2010-2020 Waste Master Plan* (Boston, MA, 2012), 2-3, <http://www.mass.gov/dep/recycle/solid/mprev12.pdf> (accessed March 28, 2013).

¹⁵ These technologies are purported to dispose of 90% of solid waste by volume, a similar level to incineration, but with lower-levels of emissions and energy requirements. Massachusetts DEP, "Alternative Waste Management Options," *Waste & Recycling*, <http://www.mass.gov/dep/recycle/swalt.htm> (accessed March 28, 2013).

¹⁶ Weekly Address: Confronting the Growing Threat of Climate Change, Pres. Barack Obama. June 29, 2013

¹⁷ Ibid; The Tellus Institute in partnership with Cascadia Consulting Group & Sound Resource Management, *Assessment of Materials Management Options for the Massachusetts Solid Waste Master Plan Review* (Boston, MA, 2008), 1-9, <http://www.mass.gov/dep/recycle/priorities/tellusmmr.pdf> (accessed March 28, 2013).

¹⁸ GAIA, "Incinerators: Myths vs. Facts."

¹⁹ Eco-Cycle, *Waste-of-Energy*, 7-8; Friends of the Earth (United Kingdom), "Pyrolysis, Gasification and Plasma," *Briefing* (Sept. 2009), http://www.foe.co.uk/resource/briefings/gasification_pyrolysis.pdf (accessed March 28, 2013); Global Alliance for Incinerator Alternatives, *An Industry Blowing Smoke: 10 Reasons Why Gasification, Pyrolysis & Plasma Incineration Are Not "Green Solutions"* (Berkeley, CA, 2009), http://florida.sierraclub.org/docs2009/WTEB_report.pdf (accessed March 28, 2013).

²⁰ Energy generation potential (in kilowatt hours per ton of solid waste): recycling (2,250 kWh / per ton); gasification and pyrolysis (660); incineration (585); landfilling 105. The Tellus Institute, *Assessment of Materials Management Options* 1-9; Eco-Cycle, *Waste-of-Energy*, 2.

²¹ Sound Resource Management Group, Inc., *Comparison of Environmental Burdens: Recycling, Disposal with Energy Recovery from Landfill Gases, and Disposal via Hypothetical Waste-to-Energy Incineration*, prepared for San Luis Obispo County Integrated Waste Management Authority, San Luis Obispo, California (Seattle, WA: Sound Resource Management Group, Inc., 2004), http://www.zerowaste.com/graphs/rr/comparative_lcas-final.pdf (accessed March 28, 2013). This report is the basis for the widely-cited article by Jeffrey Morris, "Comparative LCAs for Curbside Recycling, Versus Either Landfilling or Incineration With Energy Recovery," *International Journal of Life Cycle Assessment* 13, no. 3 (2005): 226-234.

²² The Impact of the Bottle Bill Update on Jobs in the Economy, An Analysis of Employment in the Recycling Sector. MA Sierra Club, MASSPIRG July 2012.

http://www.massbottlebill.org/ubb/files/UBB_employment_report.pdf

²³ This would be slightly offset by the costs of collection and processing for recycling and composting costs, but much better overall than incineration. Massachusetts DEP. Executive Office of Energy and Environmental Affairs, *Pathway to Zero Waste*, 4.

²⁴ The Tellus Institute, *Assessment of Materials Management Options*, 1-9.

²⁵ Massachusetts DEP. Executive Office of Energy and Environmental Affairs, *Pathway to Zero Waste*, iii-x.

²⁶ Eco-Cycle, "Zero Waste: The Choice for a Sustainable Community," <http://www.ecocycle.org/zerowaste/> (accessed March 28, 2013).

²⁷ Massachusetts DEP. Executive Office of Energy and Environmental Affairs, *Pathway to Zero Waste*, 13-14; Massachusetts DEP, "How Solid Waste Is Regulated in Massachusetts."