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CONNECTING THE DOTS ON MERCURY POLLUTION:

How Honeywell's Failure to Capture Discarded Mercury Thermostats Contributes to Elevated Mercury Emissions in New York

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Introduction

Honeywell International is the world's leading manufacturer of thermostats. In the 1940's, Honeywell developed its trademark round, mercury-based, electro-mechanical thermostat for residential use. Although Honeywell announced that it would stop producing mercury-based thermostats in 2006, they still hang on the walls of millions of households across the country. As these mercury thermostats are taken out of service, they create a disposal problem.

"Producer responsibility" legislation has been introduced in New York requiring thermostat manufacturers to establish a collection program for discarded mercury thermostats. However, for the past two years Honeywell and its allies have successfully blocked its passage.

This white paper examines the connection between Honeywell's lobbying efforts and the high mercury emissions from garbage incinerators in New York State.

1. Thermostats are a Major Source of Mercury in the Waste Stream

Significant progress has been made in reducing the amount of mercury contained in consumer products sold in New York. In 2004, New York banned the sale of mercury-containing fever thermometers and novelty items. In 2005, the state phased out the sale of mercury-added consumer products such as relays, switches, thermostats and measuring devices, and banned their disposal in solid waste facilities. However, the 2005 law provided no plan for how discarded products containing mercury would be collected.

Mercury-containing thermostats are one of the major sources of mercury in the waste stream. Each thermostat contains on average four grams of liquid mercury (about a thimbleful), enclosed in a glass ampoule. This is about eight times the average amount of mercury found in a mercury fever thermometer (.5 g), and 800 times the average amount of mercury in a compact fluorescent lamp (5 mg). Properly collected, this mercury can be retrieved and carefully disposed of. But

when crushed or incinerated, the glass ampoule shatters and the mercury is released into the environment.

Each year, an estimated 310,000 thermostats containing mercury are taken out of service in New York, according to the Northeast Waste Management Officials' Association (NEWMOA.[1] Of this amount, just over one 1% are captured in New York each year through existing voluntary collection programs.[2] **This means that more than 98% of the discarded thermostats – containing over a ton of mercury – are being sent to landfills and incinerators in New York each year.**

2. Garbage Incinerators are a Major Source of Mercury Emissions in New York

At least some of the mercury entering the waste stream is coming out the stacks of New York's garbage incinerators and polluting our air. While mercury emissions from incinerators have declined since the 1990's, due in large part to stricter air pollution regulations, garbage incinerators are among the largest sources of mercury emissions in New York. Recent data released by the New York State Department of Environmental Conservation (DEC) show that in 2009, **garbage incinerators in New York released more pounds of mercury into the air than coal-fired power plants**.[3]

According to DEC data, the total mercury emissions from the state's ten garbage incinerators in 2009 was 128 pounds, while the total mercury emissions from the state's nine coal-fired power plants was 94 pounds.[4] (See Figure 1)

Millions of New Yorkers live near municipal solid waste incinerators across the state (see map, page 7). Long Island's four garbage incinerators account for nearly half the total mercury emissions from incinerators, primarily the Hempstead Resource Recovery Facility in Westbury (29 pounds) and the Babylon Resource Recovery Facility in West Babylon (26 pounds). The Covanta Niagara incinerator in Niagara Falls released the largest amount of mercury emissions (34 pounds).

3. Mercury Poses Serious Health Hazards to Women and Children

Mercury has been targeted for reduction because it is a highly potent neurotoxin that is especially harmful to pregnant women, developing fetuses, and infants and children. Mercury can cause permanent damage to brain, kidneys and fetuses, and is particularly harmful to children and unborn babies because their nervous systems are still developing. Mercury can adversely affect children's memory, attention, language development, IQ, and motor skills.[5]

The most common route of human exposure is through the consumption of contaminated fish, or, in the case of fetuses and infants, through in utero exposures and breast milk from mothers who eat contaminated fish. New York has issued health warnings against consuming fish from the Catskills, the Adirondacks, and nearly 100 other water bodies due to mercury contamination.[6]

Mercury released into the atmosphere from sources such as incinerators, power plants, and cement kilns comes back down to the land and waterways in the form of rain, snow, or dry

Figure 1. Annual Emissions from Incinerators and Coal Fired Power Plants in New York

Annual Emissions

Muncipal Waste Combustors - 2009 Data

DEC ID	Facility	Hg (lbs)	Pb (lbs)	Cd (lbs)	CO (tons)	NOx (tons)	SO2 (tons)	HCl (tons)
1282001727	Hempstead Resource Recovery Facility	28.7	16.2	1.4	256.06	625.33	35.17	43.81
1472000777	Babylon Resource Recovery Facility	25.7	15.8	0.92	34.64	181.79	46.22	30.13
1472600790	Huntington Resource Recovery Facility	4.5	21.3	1.5	57.81	359.07	5.25	4.27
1472800185	Islip McArthur Resource Recovery Facility	1.84	0.55	0.14	64.36	198.05	24.53	12.39
3134600019	Dutchess Co. Resource Recovery Facility	7.24	2.49	0.82	85.39	166.78	28.69	26.82
3551200031	Wheelabrator Westchester LP	18	179	9	29.02	674.78	56.61	NA
5534400001	Wheelabrator Hudson Falls	5.8	40.7	3.9	9.6	117.28	14.65	10.1
7314200028	Onondaga Co. Resource Recovery Facility	2.1	26.5	1.7	22.09	539.31	28.86	10.14
7355800013	Oswego Co. Energy Recovery Facility	0.0065	0.0035	0.0055	0.58	161.15	23.06	12.66
9291100113	Covanta Niagara LP	34	80	0	95.55	746.72	136.7	89.95
Average Emissions		**12.79**	**38.25**	**1.94**	**65.51**	**377.03**	**39.97**	**24.03**
Total Emissions		127.88	382.55	19.38	655.10	3770.26	399.74	240.27

Coal Fired Electric Generating Stations - 2009 Data

DEC ID	Facility	Hg (lbs)	Pb (lbs)	Cd (lbs)	CO (tons)	NOx (tons)	SO_2 (tons)	HCl (tons)
3334600011	Danskammer Generating Station	26	0.013	16	77.69	915.49	3770.73	186.48
7034600045	AES Westover	0.14	112.80	0.38	53.73	714.99	6232.56	128.95
7503200019	AES Cayuga	2.21	784.74	2.62	153.86	2110	2196.4	369.25
8573600004	AES Greenidge LLC	0.015	33.009	0.11	47.76	381.16	427.72	6.41
9060300021	Dunkirk Steam Generating Station	39	101	15	398.85	2270.4	4317.8	26.9
9146400130	Huntley Steam Generating Station	26	30	6	297.03	1541.1	6018	18.35
9291100152	Niagara Generating Facility	0.0094	0.018	0.04	1.53	3.45	0.01	NA
9293800003	AES Somerset LLC	0.15	301.28	1.0058	312	3748.2	5070.1	791.86
Average Emissions		**11.69**	**170.36**	**5.14**	**167.81**	**1460.60**	**3504.17**	**191.03**
Total Emissions		93.52	1362.86	41.15	1342.45	11684.79	28033.32	1528.20

Source: N.Y.S. Department of Environmental Conservation

deposition. Through bacterial processes, inorganic mercury is converted into organic mercury, or methylmercury, which bioaccumulates up the food chain into fish, and ultimately humans.[7] Airborne deposition of as little as one gram of mercury a year – one fourth of what is contained in the average thermostat – over time can contaminate the fish in a 20-acre lake.[8]

4. The Industry's Voluntary Program to Collect Mercury Thermostats Isn't Working

Because of mercury's environmental hazards, the DEC recommends product stewardship for all mercury containing products.[9] The state's current solid waste management plan, Beyond Waste, notes that "mercury containing thermostats are a particularly important target because they represent a small waste stream that, unfortunately, includes a significant amount of mercury."[10]

If designed and implemented properly, producer responsibility approaches, such as takeback programs, are the fairest and most effective way of addressing problem materials in the waste stream. If not designed to succeed, however, they can just serve as window dressing, providing the appearance of solving a problem but not actually doing so.

Figure 3. TRC 2008 Per Capita State Collection Data

State	Thermostats Collected	Population 2008	Thermostats collected per 10,000 residents
Maine	5,555	1,316,456	**42.2**
Minnesota	12,724	5,220,393	**24.4**
Vermont	1,367	621,270	**22.0**
Maryland	10,207	5,633,597	**18.1**
Wisconsin	8,663	5,627,967	**15.4**
Virginia	8,191	7,769,089	**10.5**
Oregon	3,072	3,790,060	**8.1**
Delaware	681	873,092	**7.8**
North Dakota	483	641,481	**7.5**
Ohio	8,571	11,485,910	**7.5**
Michigan	7,436	10,003,422	**7.4**
Indiana	4,614	6,376,792	**7.2**
Florida	12,410	18,328,340	**6.8**
Pennsylvania	7,560	12,448,279	**6.1**
Nebraska	998	1,783,432	**5.6**
Connecticut	1,838	3,501,252	**5.2**
Iowa	1,536	3,002,555	**5.1**
Washington	3,336	6,549,224	**5.1**
Kansas	1,317	2,802,134	**4.7**
Montana	435	967,440	**4.5**
Massachusetts	2,770	6,497,967	**4.3**
New Hampshire	546	1,315,809	**4.1**
Idaho	565	1,523,816	**3.7**
North Carolina	3,407	9,222,414	**3.7**
Kentucky	1,571	4,269,245	**3.7**
Rhode Island	370	1,050,788	**3.5**
Illinois	4,336	12,901,563	**3.4**
New Jersey	2,756	8,682,661	**3.2**
West Virginia	455	1,814,468	**2.5**
South Dakota	173	804,194	**2.2**
New York	3,774	19,490,297	**1.9**
California	7,007	36,756,666	**1.9**
Missouri	895	5,911,605	**1.5**
Tennessee	880	6,214,888	**1.4**
Arizona	763	6,500,180	**1.2**
Nevada	254	2,600,167	**1.0**
Colorado	482	4,939,456	**1.0**
South Carolina	376	4,479,800	**0.8**
Texas	1,820	24,326,974	**0.7**
Arkansas	212	2,855,390	**0.7**
Oklahoma	248	3,642,361	**0.7**
Georgia	506	9,685,744	**0.5**
Mississippi	142	2,938,618	**0.5**
Louisiana	183	4,410,796	**0.4**
Alabama	119	4,661,900	**0.3**
Alaska		686,293	**0.0**
D.C.		591,833	**0.0**
Hawaii		1,288,198	**0.0**
New Mexico		1,984,356	**0.0**
Utah		2,736,424	**0.0**
Wyoming		532,668	**0.0**
Totals	**135,604**	**304,059,724**	**4.5**

Source: Turning Up The Heat

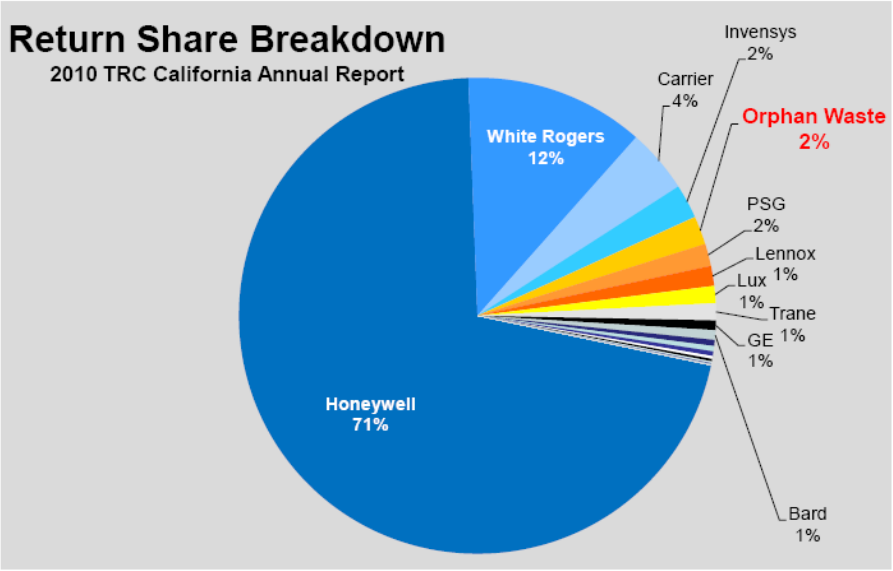
In 1998, Honeywell, White-Rogers, and General Electric, the three major thermostat manufacturers, joined together to form the Thermostat Recycling Corporation (TRC). The purpose of TRC is to administer a nationwide voluntary collection program for mercury thermostats. While TRC now has more than two dozen corporate members, a Honeywell representative serves as the TRC Board chair.[11]

Last year a coalition of state groups, which included NYPIRG, released an analysis of the TRC program's first ten years of collection data. The report, *Turning Up the Heat*, found that the industry's voluntary effort collected less than 5% of the thermostats estimated to have been discarded nationwide during that period.[12] In many states, the TRC program barely functioned, capturing only a tiny fraction of discarded mercury thermostats. New York State, for instance, ranked 31st in the country in per capita collection rates in 2008, putting New York in the bottom third of states with programs (see chart, Figure 2).

In contrast, states with strong mandatory collection programs achieved the highest collection rates. For instance, in 2008, Maine, which requires manufacturers to pay a $5 bounty for each mercury-containing thermostat that is returned, achieved per capita collection rates more than 20 times higher than what New York was achieving through voluntary collection efforts. (Appendix D)[13] Since then, other states have adopted or begun implementing new laws establishing thermostat collection programs, including Vermont, Rhode Island, California, and Illinois. However, it's impossible to compare the effectiveness of these programs because TRC stopped releasing its state-by-state collection data after the *Turning Up The Heat* report was published.

Just as Honeywell dominated the sale of mercury thermostats, it has the greatest responsibility for collecting them, and the greatest potential cost burden. In California, Honeywell manufactured most (71%) of the discarded mercury thermostats that were collected in 2010 (Fig. 3).[14] So it is likely in New York as well that Honeywell has the greatest stake in any legislation mandating collection requirements.

Figure 3. Honeywell's Share of Discarded Thermostats



Source: California Department of Toxic Substances Control

5. Attempts to Establish a More Effective Thermostat Collection Program in New York Have Been Blocked by the Industry

For the past two years, bills have been introduced in both houses of the New York State Legislature requiring manufacturers to achieve minimum collection goals for recovering mercury thermostats. However, these bills have failed to become law due to industry opposition, by all appearances primarily from Honeywell.

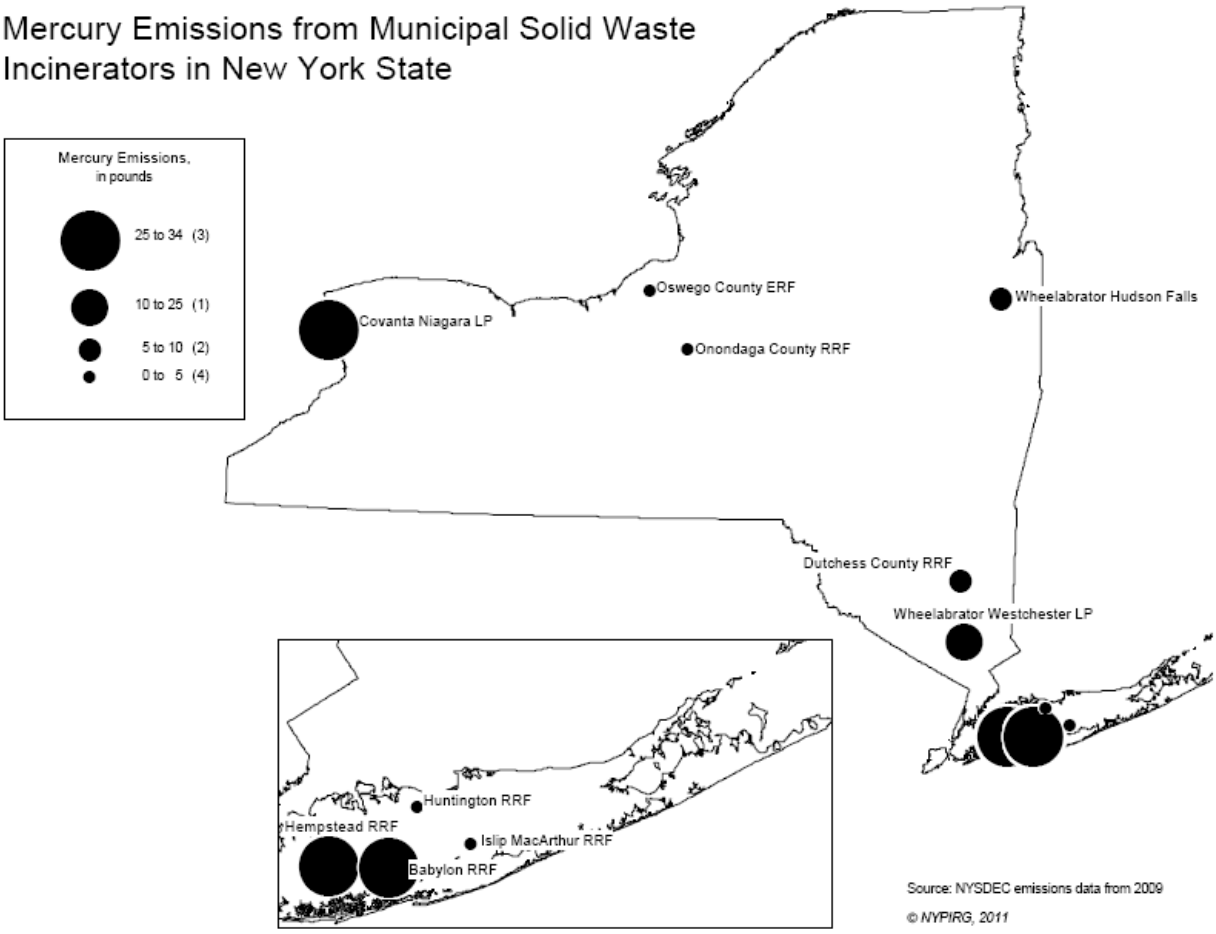
In 2011, Assembly Bill 3485, introduced by Assemblyman Bob Sweeney (D-Suffolk), chair of the Assembly Environmental Conservation Committee, passed for the second year in a row. A compromise bill, Senate Bill 4345, introduced by Senator Mark Grisanti (R-Erie), chair of the Senate Environmental Conservation Committee, was poised for passage in June but ran into industry opposition, despite being modeled after Illinois' law which was supported by Honeywell.

While Honeywell was not the only entity opposing these bills – the Business Council and the National Electronic Manufacturers Association (NEMA), which both count Honeywell as a member, also weighed in against them – state lobbying data indicate that Honeywell is the most heavily invested in this effort. Honeywell has retained the services of Patricia Lynch Associates, one of the most well-connected lobbying firms in Albany, with a $90,000 a year contract. In addition, Honeywell International has dispatched its own lobbyist from Washington, DC to lobby on the bill in New York. While Honeywell reported lobbying on eight different bills during the 2011 legislative session, the thermostat bill (S.4345) is the only piece of legislation for which Honeywell reported lobbying activity this fall.

Conclusion

While it is impossible to identify the exact source of each pound of mercury coming out of the stacks of New York's garbage incinerators, it is fair to say that reducing the amount of mercury entering the waste stream would help reduce the amount of incinerator emissions. New York should continue to build on its record of success in reducing mercury in the waste stream, focusing on the most significant remaining sources such as thermostats.

Every year that Honeywell and its allies succeed in blocking the creation of an effective thermostat collection program in New York, an estimated ton of mercury will end up in our incinerators and landfills. There is an urgent need to address this problem, since many of the older thermostats are reaching the end of their useful life, or are being replaced by programmable thermostats as part of energy-efficiency retrofits. It is imperative that the New York State Legislature adopt strong producer responsibility legislation in 2012, modeled after the most successful thermostat collection programs established in other states.


Mercury Emissions from Municipal Solid Waste Incinerators in New York State
Mercury Emissions, in pounds
25 to 34 (3)
10 to 25 (1)
5 to 10 (2)
0 to 5 (4)
Covanta Niagara LP
Oswego County ERF
Onondaga County RRF
Wheelabrator Hudson Falls
Dutchess County RRF
Wheelabrator Westchester LP
Huntington RRF
Hempstead RRF
Islip MacArthur RRF
Babylon RRF
Source: NYSDEC emissions data from 2009
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Endnotes

[1] *Review and Assessment of Thermostat Recycling Activities in the Northeast*, NEWMOA, June 2008. p 8. Available at http://www.newmoa.org/prevention/mercury/publications.cfm.
[2] *Ibid*, p. 6, and Mercury Products Campaign; *Turning Up The Heat: Exposing the Manufacturers' Lackluster Mercury Thermostat Collection Program*, February 2010, p. 6. Available at http://mercurypolicy.org/?p=985.
[3] Steven C. Russo, Esq., *et al*., Comments of the New York State Department of Environmental Conservation Regarding the Verified Petition of Covanta Energy Corporation, In the Matter of the Application of Covanta Energy Corporation for Modification of the List of Eligible Resources Included in the Main Tier of New York's Renewable Portfolio Standard Program to Include Energy From Waste Technology, State of New York Public Service Commission, Case 03-E-0188, August 19th, 2011. The DEC analysis also showed that on a per megawatt hour basis, garbage incinerators release fourteen times as much mercury as coal-fired power plants
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