



**Mercury Thermostat Recycling Rate Methodology Project**

January 28, 2010

Call Summary

California’s [mercury thermostat law](#) requires that thermostat manufacturers estimate the number of mercury thermostats available for collection and provide results to the CA Department of Toxic Substances Control by December 31, 2009. Last fall, Skumatz Economic Research Associates conducted a survey on behalf of the Thermostat Recycling Corporation (TRC) to determine that number. The purpose of this call was to review the report that summarizes results from that survey, [Mercury-Containing Thermostats: Estimating Inventory and Flow from Existing Residential & Commercial Buildings](#). A second purpose was to discuss the needs of PSI’s members in assessing the performance of mercury thermostat collection programs in their states and next steps for PSI’s mercury thermostat recycling rate methodology project.

**Summary of survey results:**

The TRC study confirms that there are hundreds of thousands of mercury thermostats available for collection in California. In the first year of the collection program, TRC estimates that between 237,000 and 490,000 mercury thermostats will come out of service and be available. The “flow” of mercury thermostats will continue for decades. In year 25 of the CA collection program, for example, 99,000 to 205,000 will be available for collection. To put these numbers into context, TRC collected 7007 mercury thermostats in CA in 2008, just 1 to 3 percent of the number available for collection based on their own recycling rate methodology.

The study offers detailed information about (1) the number of thermostats in place in California businesses and residences, (2) the age of thermostats in place, (3) the numbers of thermostats coming out of service, and (4) people’s awareness of the need to recycle mercury thermostats. It offers limited information on (5) the number of *mercury* thermostats in place and coming out of service. The tables and description below summarize key findings.

1. Number of thermostats in place in California:

Business	5.6 thermostats/business	Statewide: 4.1 million
Residence	1.2 thermostats/residence	Statewide: 15.7 million
<b>Total</b>		<b>19.8 million</b>

2. Average age of thermostats in place in California:

Business	15.7 years
Residence	11.7 years
Weighted average	12.56 years

3. Estimated “flow” of thermostats out of CA homes and businesses: Based on information collected in the survey on the age of thermostats in use, when respondents had replaced thermostats in the past, and other information on

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expected useful life, TRC’s consultant predicted the proportion of thermostats in place that would be expected to flow out of buildings each year into the future. The total flow of mercury thermostats over 25 years is 4.1 million to 7.6 million.

4. Awareness of the presence of mercury in thermostats and need to recycle: The survey found a general lack of public knowledge about the possibility that older thermostats could contain mercury or awareness that discarded thermostats should be recycled.

5. Prevalence of mercury thermostats: One weakness of the study is the limited insights it offers about the number of mercury thermostats in place and coming out of service. On page 1 of the report, the consultant states that results “cannot accurately project the share of ... total thermostats that are mercury-containing.” Findings with respect to the percentage of thermostats that are mercury come from two sources. First, the consultant assumed that all digital thermostats were not mercury. The survey determined that 54% of thermostats in place in CA businesses, and 53% of thermostats in place in CA residences, were digital. Therefore, the high end of the range of thermostats that could be mercury was 46% for businesses and 47% residences. Participants on the call noted that in most states, digital thermostats are probably much less common. Second, the consultant conducted a validation study in 30 homes and businesses in the Bay Area. A contractor removed the cover on each non-digital thermostat to determine whether or not it was mercury. Of the thermostats inspected in this small sample, 22% to 27% were mercury. (The low estimate was for thermostats found in businesses, while the high estimate was for thermostats found in residences.)

Business	Low and high percentage estimates: 22% - 46%	.9 million – 2.2 million
Residence	Low and high percentage estimates: 27% - 47%	4.2 million – 8.4 million
Total		<b>5.1 million – 10.5 million</b>

**Comparison of results to other thermostat studies:**

EPA estimated in 1994 that 2 to 3 million mercury thermostats were available annually for collection. The mid-point of the TRC range (363,500) is larger than the EPA’s 1994 estimate, based on CA’s percentage of the US population. (See US EPA, 1994, “[Mercury Usage and Alternatives in the Electrical and Electronic Industries.](#)”) States seeking a rough estimate the number of mercury thermostats available for collection can use EPA’s national figure of 2 to 3 million mercury thermostats as a benchmark. Simply multiply the percentage of the US population residing in a given state by 2.5 million. Keep in mind that this is a *conservative* estimate.

Maine’s methodology for calculating the number of mercury thermostats available for collection is based on several assumptions that are more conservative than TRC’s findings. ME assumes that 1.25 thermostats/commercial building and 1.5 thermostats/residence, and that the average lifespan of a thermostat is 30 years.

PSI’s methodology is based on thermostat sales for replacement. Using manufacturer sales data collected by Frost & Sullivan, we estimate that 10.2 million thermostats were sold for replacement in the US in 2002. In CA, that number would be about 1.23 million, based on its percentage of the US population. If we assume that 37% are mercury (the mid-point between the TRC ranges), the number available for collection would be more than 450,000, within the range of the TRC study findings.

**Implications for PSI Methodology Project:**

In the next couple of months, PSI plans to complete its project to determine the percentage of thermostats coming out of service that contain mercury. We will:

- Conduct a national survey of members of the Air Conditioning Contractors of America (ACCA). ACCA will run an online electronic survey of its members. The survey will collect data to answer the question, “Of the thermostats ACCA members remove, how many are mercury?” PSI will provide the actual survey questions and analyze results.
- Supplement the results from the national survey with validation in Maine, Iowa, and possibly Florida or California. We will contact contractors who are already collecting mercury thermostats and ask them to track over a period of several months the percentage that are mercury.

**Discussion:**

Discussion focused on three areas: whether the survey adequately explored the percentage of thermostats in service that contain mercury, general conclusions that can be drawn from the results, and different types of performance metrics that states may want to use to assess their programs.

Participants on the call questioned whether the survey might have provided more guidance to respondents to help them determine whether their thermostat contained mercury. CA DTSC felt it would be inappropriate to ask respondents to remove thermostat covers themselves. The questionnaire included photographs of six different thermostat types. In fact, there are many more than six types of thermostats.

The results establish that the performance of TRC collections in CA is currently extremely poor. They underscore the importance of collection goals in state thermostat laws. Education of both residents and contractors is sorely needed. Financial incentives to boost performance are essential as well.

In addition to performance goals based on collection rates, thermostat programs might also include goals for awareness and education. PSI will gather information on state requirements for awareness and education in laws and regulations for thermostats and other products to share with call participants.

**Participants in January 28, 2009 call:**

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