Measuring the Performance of Lamps and Thermostat Collection Programs: What is Best Practice?

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Today’s presentation
- Why measure performance? What constitutes best practice?
- Performance measurement requirements in thermostat laws
  - Maine and PSI approaches
- Performance measurement requirements in fluorescent lamps laws
  - MA’s approach
- Reality check
- Conclusions
Why measure performance?

- Know if we are making a difference
- Motivate performance improvement
- Facilitate comparison and learning
- Demonstrate commitment to program outcomes
- Satisfy regulatory requirements

Characteristics of Sound Performance Measures

- Relevant: Measure progress toward stated goals
- High Quality: Underlying data are credible and reliable
- Easy to Use: No huge investment of time and resources required
- Transparent & Accessible: Data and assumptions are available for public analysis and debate
- Widely Accepted: Enable comparison among programs
- Adaptable: Can be updated as more is learned
Key Performance Metric: Collection Rate

- Refers to: Amount Collected/Amount Available for Collection
- Measures program effectiveness in capturing products that can harm environment and health
- Metric of greatest relevance for products containing mercury and other toxics

EPR Laws and Legislation for Thermostats
Maine Thermostat Program

- Maine program has $5 incentive, paid by the manufacturers. Incentive payments are a disincentive to industry to make program successful.
- Performance goals are therefore critical because expectations and potential consequences are clear. Without performance goals industry would have little pressure to improve program. Performance goals counteract disincentives.

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Calculating What’s Out There:  
Maine’s Approach

- Determine # of residential and commercial buildings  
  (based on US Census or utilities info)
  - Assume every building has a minimum of 1 thermostat
  - Assume all thermostats have a minimum of 3 grams Hg
  - **Variable:** Thermostat life span
    - 30 years is conservative; TRC states typical life span is more like 15-18 years
  - **Variable:** % of thermostats that contain Hg
    - Evidence from ME is 70-80%

- US Census # qualified buildings (homes + businesses minus mobiles, etc.) = 669,211.
- Assume each building has 1 t-stat with 3 grams Hg
  
  \[ \frac{669,211 \times 3 \text{ grams}}{454 \text{ grams}} = 4422 \text{ lbs.} \]
- **Assume that 80%, 70%, and 60% of thermostats coming out of service contain mercury**
  
  80% = 3538 lbs.; 70% = 3095 lbs.; 60% = 2653 lbs.
- Let’s say in Maine, 60% of buildings have 1 mercury thermostat with 3 grams of mercury and a lifespan is 20 years.
- 2653 lbs/20 years = 132 lbs coming off walls each year (about 20,000 mercury thermostats)

These are extremely conservative minimums

ME is about to do a study to nail the #s down

Calculating What’s Out There:

PSI’s approach

- Determine # of thermostats sold for replacement
  - # sold for replacement = # coming out of service
  - Avoids having to make assumptions about thermostat life spans
- Estimate % coming out of service that contain mercury
Frost & Sullivan (2003) report that in the US, about 10,200,000 thermostats were sold for replacement in 2002.

To estimate sales for replacement in a particular state, multiply by that state’s % of the US population.

Survey contractors to determine % coming out of service that contain mercury.

ME and PSI approaches yield similar results.

EPR Laws and Legislations for Lamps

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Performance Metrics in Lamps Laws

- ME law requires manufacturers to report recycling rate and methodology.
- MA Mercury Management Act requires agency to determine lamp recycling rate and estimate targets:
  - 30% by 12/31/08
  - 40% by 12/31/09
  - 50% by 12/31/10
  - 70% by 12/31/11

- MA, CA, EC, Stewardship Ontario, and recyclers all measure performance by comparing lamps collected to lamps available for collection based on historic lamps sales data.
- Assume different life spans for different lamp types.
- MA compared NEMA sales data to other sources; NEMA revised data.
Reality Check

- Goal of ME’s mercury thermostat law is to collect 160 lbs. by 11/09
- Reality =
  - Collected 22 lbs. in 2006
  - Collected 44 lbs. in 2007
  - Collected 47 lbs. in 2008
- TRC reports collecting 135,604 mercury thermostats in 2008, about 1% of the number of thermostats sold for replacement
- Lamps collection rate in MA was 34% in 2008, compared to 30% goal

Conclusions

- Collection rates tell us whether programs are working or need to be strengthened
- Increasingly, states are choosing collection rates as the basis for measuring performance
- Straightforward methods are available now to calculate collection rates of mercury products
- Collection efforts are falling short of goals
- To improve results, legislation should include performance goals based on collection rates as well as performance incentives
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Per capita collection rates

• A simple way to gauge a state’s collection performance relative to others
• Maine: 1,316,000 people/6731 thermostats = 195/capita
• Vermont: 621,270 people/1367 thermostats = 454/capita

In 2008, ME and VT had 1st and 3rd highest per capita collection rates in US and only two with $5 incentive programs. See available state rankings sheet.

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