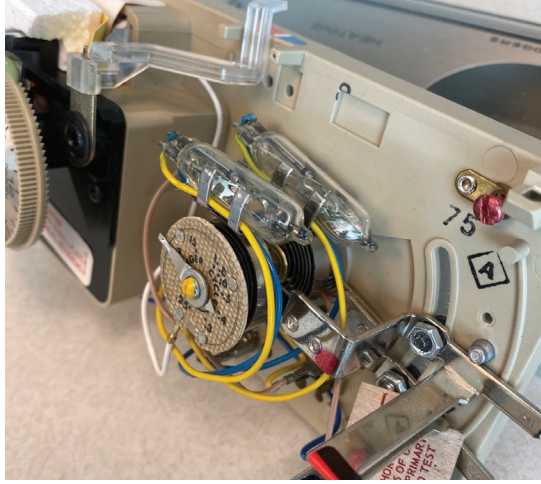


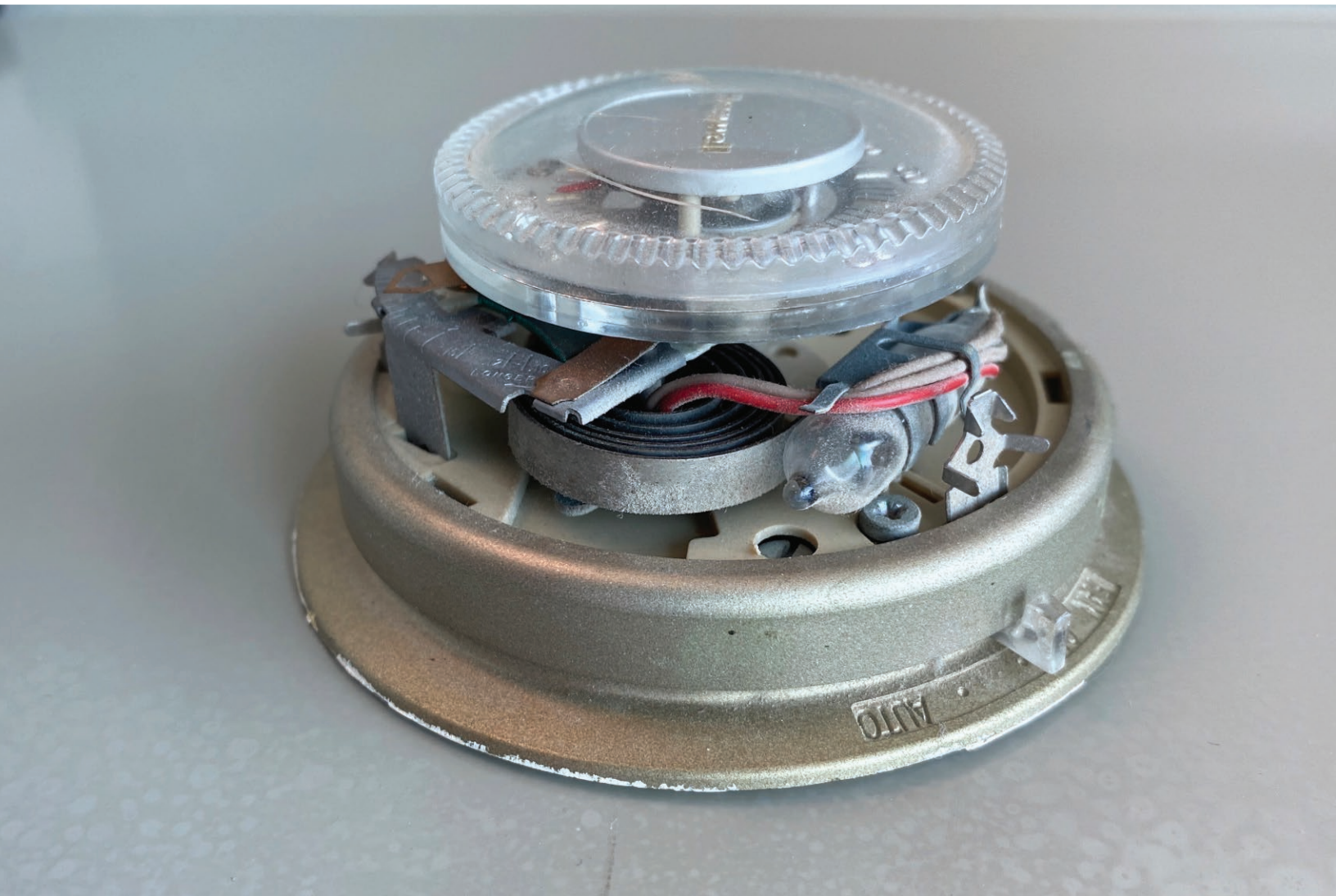
NEW YORK STATE | Department of Environmental Conservation

New York State Mercury Thermostat Collection Act

PROGRAM ANALYSIS AND RECOMMENDATIONS

REPORT TO THE GOVERNOR AND LEGISLATURE – OCTOBER 2022

Basil Seggos, Commissioner



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Legislative Charge

The New York State Department of Environmental Conservation (DEC) submits this report to the Governor and Legislature in accordance with Section 27-2907(2) of the New York State Mercury Thermostat Collection Act (Act), Environmental Conservation Law (ECL) Article 27, Title 29. That Section required a written report be issued regarding the effectiveness of the collection programs established under the Act, and that it contain: information on the number of out-of-service mercury thermostats collected, a description of how the out-of-service mercury thermostats were managed, and an estimate of the number of mercury thermostats available for collection. This report also includes recommendations related to extending the provisions of Title 29, along with other recommended programmatic and statutory changes to improve the effectiveness of the Act.

Executive Summary

The Act was signed into law on December 18, 2013, and took effect immediately. The Act required thermostat manufacturers to establish a program for the collection and recycling of out-of-service mercury thermostats, to begin on July 1, 2014. The program was to be free of cost to consumers and to participating collection locations. Thermostat manufacturers, either individually or collectively through a producer responsibility organization (PRO), were to establish a collection network and provide education and outreach on the importance of proper end-of-life management of out-of-service mercury thermostats. All thermostat wholesalers were required to participate as collection locations, while qualified contractors, thermostat retailers, and qualified local government authorities could volunteer as collection locations. Without a legislative amendment, the Act will expire in its entirety on January 1, 2024.

Mercury is a naturally occurring element that can be highly toxic to humans, depending on its chemical form. Through environmental processes, mercury cycles between elemental, inorganic, and organic forms. Elemental mercury is a silvery, odorless liquid and is the form commonly found in older household items such as thermometers and thermostats. Methylmercury is the most common form of organic mercury and is highly toxic. According to the United States Environmental Protection Agency[1], the greatest risk of exposure for humans is through the consumption of contaminated fish and shellfish via mercury entering the environment and food chain through atmospheric deposition. Manufacturing processes and the incineration of coal and waste are the predominant contributors to atmospheric mercury in the northeastern United States. Improper disposal of mercury-containing devices, such as mercury thermostats, can result in increased amounts of mercury being deposited in the environment. Mercury-containing thermostats can contain between three and four grams of elemental mercury. Because of this relatively large amount of mercury per device, proper collection and disposal of mercury thermostats should be a priority.

In 2000, prior to the enactment of the Act, the Thermostat Recycling Corporation (TRC) started a voluntary program for the collection of mercury thermostats in New York State. From 2000–2013, the voluntary program collected 35,914 mercury thermostats containing a total of 327.7 pounds of mercury. With the implementation of the Act in 2014, and its mandatory collection program, 42,417 mercury thermostats containing a total of 424.4 pounds of mercury have been collected since the requirements in the Act went into effect, resulting in approximately 20% more thermostats collected in roughly half the time of the voluntary program. These results highlight the need for an effective and mandatory mercury thermostat collection program.

In a comparison with other states' mandatory mercury thermostat collection programs, states with significantly smaller populations have collected far greater numbers of mercury thermostats than the current program in New York State. Given New York's population and older housing stock, third-party research studies, and historically low collection volumes, there are many mercury thermostats still in service that will need to be properly managed into the foreseeable future as heating, ventilation, and air conditioning systems (HVAC) are upgraded and replaced. The Mercury-Added Consumer Products Law (MACP) established a disposal ban on mercury-containing devices, including mercury thermostats. Without a convenient and widely accessible system for the collection of mercury thermostats from homeowners and contractors, many will end up in the waste stream, potentially polluting New York's environment.

This report provides an overview of the requirements of the Act, defines the various stakeholders and their responsibilities, discusses mercury thermostat collection results both prior to and after the Act's implementation, and provides recommendations to address the necessary enhancements to improve program implementation and address challenges observed. In particular, a lack of convenient collection locations in all counties of the state and the limited outreach and program oversight by

[1] "Basic Information about Mercury," United States Environmental Protection Agency, Last Modified December 21, 2021. https://www.epa.gov/mercury/basic-information-about-mercury.

thermostat manufactures and their PROs have limited the effectiveness of the program and specific recommendations are included to improve compliance.

However, none of the recommendations provided to improve the mercury thermostat collection program can be implemented if the Act is allowed to expire. If the act is allowed to sunset, the financial and managerial burden to provide for proper end-of-life management for this harmful waste stream would again fall to the State, municipalities, and taxpayers.

Overview of the Act: Definitions, Regulated Entities, and Their Responsibilities

The Act defines the following terms and establishes requirements for the following regulated entities:

Collection Program

A collection program refers to a system established for the collection, transportation, recycling, and disposal of out-of-service mercury thermostats that is financed and managed by a thermostat manufacturer individually or collectively with other thermostat manufacturers.

Mercury Thermostat

A mercury thermostat is a product or device that uses one or more mercury switches to sense and control room temperature through communication with HVAC equipment and includes thermostats used to sense and control room temperature in residential, commercial, industrial, and other buildings, but does not include a thermostat used to sense and control temperature as part of a manufacturing process. A mercury thermostat that is removed, replaced, or otherwise taken out of service is referred to as an “out-of-service mercury thermostat” in the Act.

Thermostat Manufacturer

A thermostat manufacturer is a person who owns or owned one or more name brands of mercury thermostats sold in the state. The Act requires thermostat manufacturers, either individually or collectively with other thermostat manufacturers, to establish, finance, and manage a collection program for out-of-service mercury thermostats.

Qualified Contractor

A qualified contractor is a person who is engaged in the business of installation, service, or removal of HVAC components and who employs seven or more service technicians or installers.

Qualified Local Government Authority

Any municipal corporation or planning unit, as defined in ECL Section 27-0107, or county department of health, is considered a qualified local government authority and may request to participate in the collection program and host a collection container.

Thermostat Retailer

A thermostat retailer is a person who sells thermostats of any kind, primarily to homeowners or other nonprofessionals through any sales or distribution mechanism, including sales using the internet or catalogs. Additionally, no thermostat retailer can sell, offer for sale, or distribute any thermostat for final sale unless the manufacturer of the thermostat has its own collection program or collectively participates in a collection program with other manufacturers.

Thermostat Wholesaler

A thermostat wholesaler is a person or company engaged in the distribution and sale of HVAC components, including thermostats, to contractors, and whose total wholesale sales account for 80% or more of their total sales. A thermostat manufacturer is not, by virtue of manufacturing, a thermostat wholesaler. Beginning July 1, 2014, no thermostat wholesaler was allowed to sell, offer for sale, distribute, or offer to distribute thermostats (of any kind) unless the wholesaler participates as a collection site for out-of-service mercury thermostats, or unless the wholesaler requested and received a waiver from DEC. Additionally, a thermostat wholesaler cannot sell, offer for sale, or distribute any thermostat for final sale unless the manufacturer of the thermostat has its own collection program or collectively participates in a collection program with other manufacturers.

Thermostat Recycling Corporation

The Thermostat Recycling Corporation (TRC) was established in 1998 by three major thermostat manufacturers to provide for the collection and proper management of out-of-service mercury thermostats at the national level. No other PRO has operated in the state. As of the end of 2021, TRC reported 29 thermostat manufacturers as supporting members. It is through TRC that the thermostat manufacturers chose to operate collectively to establish a collection program to meet the requirements of New York's Act. As of July 1, 2014, the Act required manufacturers to do all of the following:

- Compile a list of thermostat wholesalers in the state and offer each thermostat wholesaler a collection container for out-of-service mercury thermostats;
- Make collection containers available to all qualified contractors, thermostat wholesalers, thermostat retailers, and qualified local government authorities that request a container. Information regarding the proper management of out-of-service mercury thermostats must be included with each collection container;
- Establish a system to collect, transport, recycle, dispose of, and properly manage out-of-service mercury thermostats from all collection sites;
- Pay for all costs of the program without a direct charge of any fees or other charges to consumers or persons participating in the program. Unlike some other states' programs, the New York State program requires that collection containers are provided free of charge. In programs in other states, the collection location can be charged for the initial collection container(s). However, in the New York State program, there may be a fee of up to $26 for replacement of a lost or stolen collection container;
- Conduct education and outreach efforts including, but not limited to, the following activities:
  - Establish and maintain a public website for the dissemination of educational materials to promote the collection of out-of-service mercury thermostats;
  - Contact thermostat wholesalers at least once a year to encourage their support and participation in educating customers on the importance of statutory requirements for the collection and proper management of out-of-service mercury thermostats;
  - Create and maintain a web-based program that allows contractors and consumers to identify collection sites for out-of-service mercury thermostats in the state and provide a list of collection sites to DEC; and
  - Develop informational articles, press releases, and news stories pertaining to the importance of and opportunities for collecting and recycling out-of-service mercury thermostats, and distribute those materials to trade publications, local media, and stakeholder groups;
- Develop and update educational and other outreach materials for distribution to contractors, contractor associations, and consumers. These materials must be made available for use by participating thermostat wholesalers, thermostat retailers, contractors, and qualified government authorities and must include, but not be limited to, the following:
- Signage, such as posters or cling signage, that can be prominently displayed to promote the collection of out-of-service mercury thermostats to contractors and consumers; and
- Written materials or templates of materials for reproduction by thermostat wholesalers and thermostat retailers to be provided to customers at the time of purchase or delivery of a thermostat. The materials must include, but not be limited to, information on the importance of properly managing out-of-service mercury thermostats and opportunities for the collection of these thermostats.

Statewide Collection Goals and Program Modifications

Collection under the program began July 1, 2014. The Act set the collection goal for 2015 at 15,500 out-of-service mercury thermostats. No goal was required to be set for 2014. DEC was to establish collection goals for 2016–2023. These goals were to acquire the maximum feasible number of out-of-service mercury thermostats available for collection in the state and were to be developed considering the effectiveness of similar collection programs in other states; the collection requirements of similar programs in other states; any studies or reports on the number of out-of-service mercury thermostats available for collection in New York State, other states, and nationally; and any other relevant factors. Due to competing priorities with the beginning implementation stages of other states' product stewardship programs, limited resources available for the implementation of DEC's product stewardship programs, and reasons discussed in more detail in this report, specific collection goals for 2016–2023 were not established.

The Act also states that DEC may require several possible program modifications if the annual statewide goals are not met through the collection program as implemented. Possible modifications include, but are not limited to: improvements to outreach and education conducted by the operator(s) of the collection program, expansion of the number and location of collection sites established under the collection program, modification of the roles of the participants, and the addition of a $5 financial incentive in the form of either cash or coupon offered by the manufacturers to contractors and consumers for each out-of-service mercury thermostat returned to a collection site.

Collection Program Annual Report

The Act requires each thermostat manufacturer, individually or collectively with other thermostat manufacturers, to submit an annual report by April 1, beginning April 1, 2015. The annual report is required to be posted to the program operator's website and include the following program details for the prior calendar year:

- The number of out-of-service mercury thermostats collected and managed;
- The estimated total amount of mercury contained in the out-of-service mercury thermostats collected;
- A list of all thermostat wholesalers, contractors, qualified local government authorities, and thermostat retailers participating in the program as mercury thermostat collection sites and the number of out-of-service mercury thermostats returned by each;
- An accounting of the program's administrative costs;
- A description of outreach and education efforts;
- Examples of outreach and education materials used;
- The internet address where the annual report can be viewed online;
- A description of how the out-of-service mercury thermostats were managed;
- Any anticipated program modifications; and
- The identification of a collection program contact and their contact information.

Since TRC has provided the only program under the Act, all annual reports can be found at its website: https://thermostat-recycle.org/program-info/state-reports/. In addition to TRC reporting the number of out-of-service mercury thermostats collected annually, they also report the number of loose mercury switches that are often returned in the collection bins despite TRC's guidelines that only whole mercury thermostats are to be placed in the bins. By determining the average number of mercury switches in the intact mercury thermostats (mercury thermostats can contain more than one mercury switch) returned, TRC then calculates a "thermostat equivalent" number to account for the number of out-of-service mercury thermostats represented by the loose mercury switches. TRC has indicated that, on average, there are 1.4 mercury switches per mercury thermostat. TRC also reports on the number of collection containers returned each year. Collection containers can be either large bins (capable of holding up to 100 out-of-service mercury thermostats) or small pails (capable of holding up to 6 out-of-service mercury thermostats). Since the statutory requirement is to track and report on the number of out-of-service mercury thermostats, rather than mercury switches, collected by the program, this will be the metric focused on in this report.

Management as Hazardous Waste

The Act provides that all contractors, thermostat wholesalers, thermostat manufacturers, and thermostat retailers must handle and manage the out-of-service mercury thermostats collected in a manner that is consistent with the requirements for the management of hazardous waste. Mercury thermostats can be managed as universal waste per 6 NYCRR Subpart 374-3, Standards for Universal Wastes. In accordance with these regulations, TRC instructs program participants to label the collection container with the date when the first thermostat is placed into the collection container. The collection container must be sent to a destination facility within one year of the initial placement date. TRC refers to the collection containers also as "collection bins," "bins," small pails," or "pails." The tracking of collection containers is one of the major metrics used in reporting program results.

The collection containers used by TRC include a prepaid universal waste shipping label to ship the containers to a facility in Port Washington, Wisconsin, owned and operated by Veolia ES Technical Solutions, LLC, under contract with TRC. Upon receipt at the facility, the containers are opened and the contents are identified by brand then sorted and tallied. The bin or pail number, collection location, number of mercury thermostats, and number of mercury switches are recorded. Bins are returned to the collection location with a new prepaid shipping label within three weeks. Pails are not reused. TRC conducts a compliance audit of the Veolia facility every two years.

DEC Responsibilities

The Act requires DEC to maintain the following information on the DEC website, beginning June 1, 2015:

- A description of the collection programs established under the Act;
- A report on the progress toward achieving the statewide collection goals set forth in the Act; and
- A list of all thermostat wholesalers, contractors, qualified local government authorities, and thermostat retailers participating as collection sites.

As there has only been one collection program in New York State, DEC has instead linked to TRC's website, which contains a comprehensive program description and an up-to-date listing of collection site locations, as well as annual reports on TRC's collection results since the program's inception.

Additionally, DEC was to submit a written report to the Governor and the New York State Legislature regarding the effectiveness of the collection programs established under the Act, as well as information on the number of out-of-service mercury thermostats collected, a description of how the collected thermostats were managed, and an estimate on the number of mercury thermostats remaining in service. DEC was to use the information in the report to recommend whether provisions in the Act should be extended, along with any other statutory changes. This report is intended to satisfy these requirements.

Along with the above responsibilities, DEC monitors the program for compliance issues, reviews annual reports as they are submitted, and handles stakeholder inquiries concerning the program and the end-of-life management of mercury thermostats.

Disposal Prohibition

While ECL Section 27-2105 of the MACP includes a broad disposal ban for mercury thermostats that went into effect on July 12, 2005, the Act contains specific prohibitions for transporters and solid waste facilities regarding mercury-added thermostats in ECL Section 27-2909: solid waste transporters cannot knowingly commingle mercury thermostats with solid waste or recyclable materials and cannot knowingly deliver mercury thermostats to a solid waste combustor, landfill, or transfer facility for disposal. Operators of solid waste combustors or landfills cannot knowingly accept mercury thermostats for disposal. Transfer facility operators cannot knowingly commingle mercury thermostats with solid waste destined for a combustor or landfill. Additionally, each landfill or transfer facility is required to post a sign stating that mercury thermostats are not accepted at the facility.

The Act also imposed requirements on various contractors whose work may involve the end-of-life management of mercury thermostats: any person or contractor replacing a mercury thermostat in a building is required to bring the mercury thermostat to an appropriate collection location, and any person or contractor demolishing a building is required to ensure all mercury thermostats are removed prior to demolition and brought to a collection site. In addition, any state department, authority, instrumentality, or municipal corporation administering a program that involves the removal of mercury thermostats must inform the involved contractors of their obligation to deliver any mercury thermostats to a collection site and inform the contractors of the disposal prohibitions. Any contractor, organization, or subcontractor who receives funding from a New York State department, agency, instrumentality, or political subdivision for the installation, service, or removal of HVAC components that results in the removal of mercury thermostats shall ensure the collection, transportation, and proper management of out-of-service mercury thermostats in accordance with the provisions of the Act.

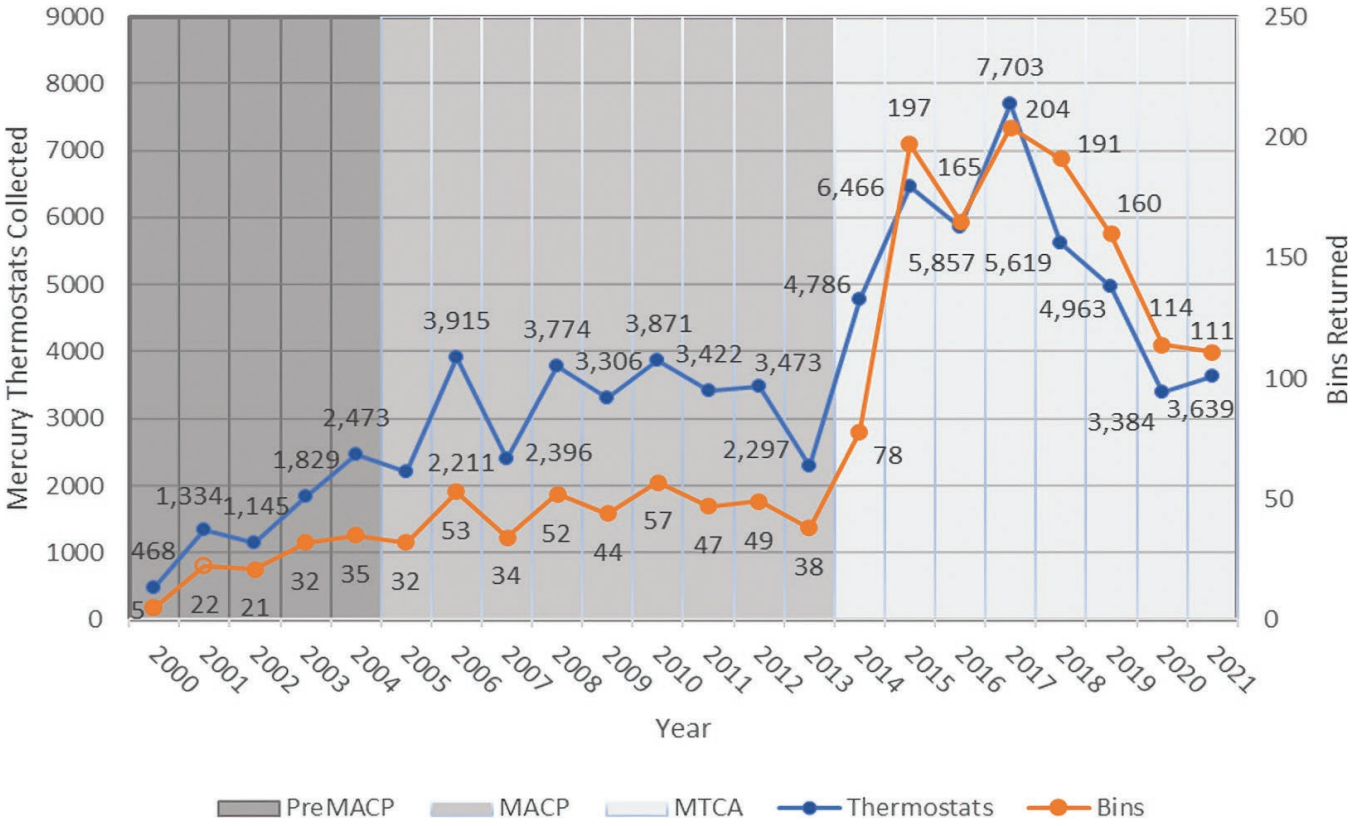
Sunset Clause

The Act is currently due to expire and will be deemed repealed on January 1, 2024. DEC was to use the information in its report to the Governor and the Legislature to recommend whether provisions of the Act should be extended.

Program Performance and Effectiveness

To evaluate the effectiveness of the Act program, it is necessary to look back on the history of TRC's collection efforts in New York State in relation to legislative actions impacting mercury thermostat collection requirements. Figure 1 displays mercury thermostat collection efforts for 2000–2021. Years 2000–2004 represent mercury thermostat collection prior to passage of the MACP, and 2005–2013 reflect the effect of the MACP disposal ban for mercury-containing products on TRC's mercury thermostat collection. Years 2014–2021 reflect the impact of the Act on TRC's mercury thermostat collection. It should be noted that all data was obtained from TRC's website (https://thermostat-recycle.org/program-info/measuring-our-impact/). TRC also provides yearly collection data from 2001 to the current year in its annual reports, also available on its website.

Figure 1: TRC Mercury Thermostat Collection in NYS 2000-2021



TRC first began operating a voluntary mercury thermostat collection program in New York State in 2000. From 2000–2004, mercury thermostat collections were historically low. This can be attributed to a minimal number of wholesalers and contractors participating as collection locations, as indicated by the low number of collection bins returned. Following the passage of the MACP and implementation of its disposal ban in 2005, there is a discerntable increase in the annual collection totals of mercury thermostats and an increase in participation of wholesalers and contractors as collection locations for TRC, as evidenced by the increase in returned collection bins. The level of collection activity from 2005–2013 was relatively steady, as TRC had settled into maintaining the voluntary program.

Following passage of the Act in 2013, the mandatory collection program began on July 1, 2014. As demonstrated in Figure 1, annual mercury thermostat collection and the number of bins returned increased significantly following the Act's implementation. Prior to the Act, the average annual mercury thermostat collection was 3,185 for the period from 2005–2013. After implementation of the Act in July 2014, the average annual collection increased to 5,302 mercury thermostats for the period from 2014–2021. Reported mercury thermostat collection data exhibits a positive trend as the disposal ban (2005) and then the Act (2014) were implemented. The increase in collection after 2014 can be attributed to the mandatory participation of thermostat wholesalers as collection points and the requirement for contractors to deliver any removed thermostat to a collection site for recycling. Collection rates in 2020 and 2021 were undoubtedly negatively impacted by the COVID-19 pandemic.

While the annual collection totals increased with the implementation of the Act, it is important to point out that for the first full year of the program (2015) the law mandated a collection goal of 15,500 mercury thermostats. For the 2015 program year, TRC reported a total of 6,466 mercury thermostats collected. DEC was to establish annual collection goals for 2016–2023, but did not initially do so, partly due to the inability of the program to meet the 2015 program year goal, but also due to the complex process outlined in the Act for setting goals, and the lack of resources provided through the legislation for implementation of the Act.

In addition to the number of bins returned annually, TRC also reports the percent of collection locations that return at least one bin each year. On average, from 2015–2021, about 30% of locations returned a bin each year. Since the Standards for Universal Wastes governing mercury-containing equipment requires collection locations to return collection bins or pails within one year of the accumulation start date, this indicates that many collection locations are out of compliance. TRC is required to contact thermostat wholesalers at least once a year to

encourage their support and participation in the program. Unfortunately, the Act does not require TRC to reach out annually to other entities acting as collection locations, such as contractors and household hazardous waste (HHW) locations.

Another way to evaluate how the New York program has performed is to compare it to other states' programs. Looking at TRC's 2019 reported collection data for states that mandated mercury thermostat collection, a per capita collection rate can be determined. Table 1 ranks the mandated-collection states based upon mercury thermostats collected in 2019 per 10,000 population, according to U.S. Census data. With 2.55 mercury thermostats collected per 10,000 people, New York ranks near the bottom of the group of mandated-collection states. It is telling that many states with lower populations and fewer housing units collect many times more mercury thermostats than states such as New York and California. The top three states, Rhode Island, Vermont, and Maine, all offer a financial incentive for the return of mercury thermostats.

Table 1: Ranking Of Per Capita Mercury Thermostat Collection In Mandatory Collection States Based On TRC Data

State	2019 Collection	2019 Population Estimate	Thermostats per 10K
RI	4,017	1,059,361	37.92
VT	2,171	623,989	34.79
ME	4,397	1,344,212	32.71
MA	13,114	6,892,503	19.03
NH	1,864	1,359,711	13.71
MN	6,891	5,639,632	12.22
PA	9,213	12,801,989	7.20
IA	2,109	3,155,070	6.68
IL	7,756	12,671,821	6.12
CT	1,694	3,565,287	4.75
CA	14,305	39,512,223	3.62
NY	4,963	19,453,561	2.55
MT	268	1,068,778	2.51

There is no conclusive way to gauge the effectiveness of the Act because there is no definitive way to determine the number of mercury thermostats taken out of service each year in New York State that would consequently require proper end-of-life management and recycling. A 2015 report prepared by Skumatz Economic Research Associates, Inc. (SERA) for the Clean Water Fund and the New York Public Interest Research Group, titled "Estimated Annual Outflow of Mercury-Containing Thermostats in the State of New York," concluded that there were potentially 4.18 million mercury thermostats still on walls in New York State, with approximately 90,000 mercury thermostats becoming available for collection annually between 2015 and 2024. Based upon an annual collection rate of 90,000, SERA's New York study indicated that less than 21% of the available mercury-containing thermostats will have been removed by the legislatively mandated sunset date of January 1, 2024. Given that the TRC collection program has only collected a total of 78,331 mercury thermostats in 21 years, it can reasonably be stated that the program will not collect an adequate volume of out-of-service mercury thermostats before the Act sunsets at the end of 2023.

Program Challenges

This section addresses the primary challenges that have reduced the program's degree of success. Identified challenges to the program include the lack of a mandated manufacturer or PRO program plan approval process; inadequate convenience requirements set in statute; potential competing HHW program collection of mercury thermostats as part of municipal services that are not included as TRC collection sites; limited outreach and program improvement efforts by the PRO and its member manufacturers; and the upcoming sunset date, which will effectively end the program unless it is extended.

Lack of a Required Program Plan by the Manufacturers or PRO

Unlike more recent extended producer responsibility and product stewardship laws, the Act does not require the manufacturers to submit a program plan or registration to DEC for approval. Without the ability to formally request modifications to a program plan for improvement, DEC had to implement the program as set forth in the legislation, with minimal requirements.

Inadequate Convenience Requirement

As of September 1, 2022, there were 495 collection locations listed on TRC's website in New York State. Of the 495 collection locations, 355 are thermostat wholesalers, 91 are contractors, 39 are identified as HHW facilities, 9 are "other" types which range from qualified local government entities to recyclers, and 1 is a retail location. The Act does not provide for any type of convenience requirement based upon demographics or municipal boundaries. Rather, the Act only requires that thermostat wholesalers participate as collection locations, or prohibits them from selling any type of thermostat. As a result, 7 of the 62 counties in New York State do not have a collection location, while an additional 10 counties have only one collection location each. Those counties that lack collection locations are mainly rural, with mostly older housing stock that would likely still have mercury thermostats in use. These areas may also have limited HHW collection availability, which could lead to the improper disposal of mercury thermostats.

Potential HHW Collection of Mercury Thermostats Outside of Program

The likelihood exists that mercury thermostats are being collected through non-TRC program channels, such as municipal and private HHW collection programs, and the collection goes unreported by the TRC program. Many of the 39 collection locations indicated as "HHW facilities" by TRC are not true HHW locations regulated by DEC, but qualified local government authorities that joined the TRC program. TRC is missing this important opportunity to ensure it enlists all HHW collection programs across the state that are actively collecting mercury thermostats outside of the TRC program. Since an extended producer responsibility takeback program exists for mercury thermostats, mercury thermostat collection costs are not eligible for reimbursement through DEC's HHW collection grant program. These HHW program locations would benefit from participating with TRC and having collection costs covered.

Limited Outreach and Program Improvement Efforts by the PRO

TRC has implemented a voluntary program since 2000 and the mandatory program since 2014. Despite this length of time, there have been limited efforts toward increasing program effectiveness by the PRO and its member thermostat manufacturers. TRC provides details on the program's outreach efforts meant to encourage noncompliant collection locations to return bins. These efforts consist of telephone calls and site visits, as well as postcard and email reminders. TRC contracts a third party, the Center for Ecotechnology (www.centerforecotechnology.org), to conduct the telephone calls and site visits on behalf of TRC. In its annual reports to DEC, TRC provides the number of telephone calls and site visits made during each month of the year and lists the collection locations receiving them. Along with this data, TRC provides a record of bin receipts each month of the year. Historically, site visits result in a greater increase in bins being returned the following month than do telephone calls. Despite this indicator of effectiveness, not all noncompliant collection locations are visited. Based on the reported data, those locations that the Center for Ecotechnology visits on behalf of TRC appear limited to thermostat wholesalers. On average, only about 30% of collection locations return a bin annually, with many of these locations doing so repeatedly year after year. This indicates that there are many locations that have not returned bins for multiple years, if ever, and no action has been taken to increase returns. The effectiveness of postcards and email reminders is not discussed in the annual reports, limiting the ability to adequately assess the effectiveness of those efforts.

The Act only requires that thermostat wholesalers are contacted on an annual basis but does not specify the method of contact. If a collection location has not returned a bin within the latest 12-month period, then TRC will send a postcard reminder followed by an email reminder to that location. If a collection location fails to send in a bin in more than a year, TRC will attempt to contact the location via telephone. If the location is a thermostat wholesaler, TRC will attempt to have the location visited by its contractor. In a review of data DEC requested from TRC regarding active location collection activity, 147 out of 464 locations have not returned a bin since the program began in 2014 and are not actually participating in the collection and recycling of mercury thermostats. This strongly suggests that TRC's overall outreach strategy to inform and remind locations of their responsibility to return bins within the one-year time period under the Standards for Universal Wastes is ineffective. TRC should attempt to visit all collection locations that have not returned a bin in more than a one-year period.

Aside from its ineffective methods for outreach to collection locations, TRC has demonstrated a lack of concern in meeting program goals and heeding DEC input when provided. TRC offered no explanation for failing to meet the mandated 2015 collection goal of 15,500 mercury thermostats. Without understanding TRC's reasons for under-collection, it was difficult for DEC to offer potential solutions. In an October 2018 letter to TRC concerning its 2017 annual report, DEC took issue with TRC reporting that the 2017 collection total was 32% higher than 2016's collection total. DEC identified that the 2016 collection total was approximately 10% below the 2015 collection total, and that each year's collection total was below

the initially mandated 2015 collection goal of 15,500 mercury thermostats. DEC advised TRC to consider the 15,500-thermostat collection goal as a baseline target for collection. TRC did not acknowledge DEC's direction in its written reply.

As seen in Table 1, the states with the highest collection volume are smaller in geographic size and population compared to New York State. The majority of TRC's outreach and education program is directed at the HVAC industry and thermostat wholesalers. The average homeowner is most likely not directly exposed to TRC's outreach efforts. Lack of outreach to the group expected to be the primary source of out-of-service mercury thermostats and a collection network with lackluster participation will not produce significant numbers of mercury thermostats collected for recycling. Consumers and contractors are apt to be more engaged in a program when they are aware of it, and if it offers a financial incentive.

Lack of Program Funding

DEC receives no funding from thermostat manufacturers for expenses related to program oversight. Most extended producer responsibility laws provide funding to the oversight agency in the form of a registration fee, program plan submittal fee, annual reporting fees, surcharge penalties, and reimbursement for actual expenses incurred. Without funding, DEC is unable to hire adequate staff necessary to monitor the program for compliance, conduct necessary enforcement, or provide education and outreach assistance to the regulated community to supplement the minimal efforts made by thermostat manufacturers and their PRO.

Upcoming Sunset Date

The Act's establishment of an acceptance program expiration (sunset) date and MACP's continuous disposal ban conflict with each other. Without the mandated participation of thermostat wholesalers, collection locations will most likely decrease or disappear entirely. This is counter to the intent of both laws, as well as the State's overall waste management strategy. The loss of mercury thermostat collection locations will result in an increase in improper disposal. Also, with the expiration of the Act, the burden to provide for the end-of-life management and costs of this waste stream would again fall to municipalities through HHW collection programs shared by the State through the HHW management grant program.

DEC Recommendations

Considering the challenges of the current program, historical under-collection, and indications that a significant number of mercury thermostats are still in service in New York State and destined to require proper end-of-life management, DEC has the following recommendations for legislative amendments to the Act:

- Extend the Act beyond the current expiration date of January 1, 2024. The current Act expires in its entirety on that date and the progress the Act has supported in terms of the number of drop-off locations would no doubt be negatively impacted if the requirement for wholesalers to participate as collection locations was to end. An amendment should be proposed to allow the Act to continue indefinitely or, at minimum, to provide for a new expiration date well enough into the future to ensure continuance of this important waste diversion and recycling program. Either scenario may include a future date for reevaluation;

- Introduce a financial incentive payable by the PRO and its member manufacturers to motivate homeowners and contractors to participate in the thermostat recycling program. Several states where financial incentives have been implemented have shown significant improvement in collection totals and in consumer awareness. Even an amount as low as $5 per thermostat collected can have a significant impact on collection results, as evidenced by collection programs in the states of Maine and Vermont. California has implemented a $30 incentive payment, although the result of this incentive on collection numbers has yet to be evaluated;

- Establish a convenience standard requiring a collection location in every municipality with a population of 10,000 or greater and a minimum of one collection location per county. As noted in the Program Challenges section, 7 of the 62 counties in the state do not have a TRC collection location available to homeowners or contractors. The Act authorized qualified local government authorities to act as collection locations. By requiring a collection site in each county, TRC would be mandated to reach out to available authorized entities to recruit them as collection sites and meet the convenience requirements established by the amended legislation. Participation of all thermostat wholesalers should still be required and properly enforced;

- Require additional outreach on the part of the PRO to engage with various stakeholders about the program. The majority of TRC's past outreach targeted wholesalers and contractors but often consisted of direct mail or email campaigns, which, as evidenced by TRC's own annual reports, did not result in significant engagement. The PRO should be mandated to visit each participating collection location on a regular basis to provide education and training for staff and to address any programmatic issues; and

- Require the thermostat manufacturers to reimburse DEC for actual administrative costs to oversee the Act.

Outside of legislative amendments, if the Act is extended and modified as recommended, DEC should implement the following programmatic adjustments to improve program performance:

- Dedicate additional staff resources for outreach, monitoring the program for compliance, and pursuit of enforcement, when necessary;

- Engage in more frequent communication with the PRO to discuss ongoing implementation challenges and offer timely solutions;

- Educate the state's HHW facility and event operators on the opportunities available through this program;

- Modify HHW annual reporting procedures to obtain relevant mercury thermostat collection data if HHW events and facilities continue to collect this waste stream; and

- Perform additional universal waste inspections at HVAC wholesalers and other entities collecting and storing mercury thermostats to ensure compliance with storage time limits and other operational requirements, and pursue enforcement when necessary.

The above proposed legislative amendments to the Mercury Thermostat Collection Act, carried out in combination with the recommended DEC-implemented programmatic adjustments, will improve mercury thermostat collection results. The first, most important step, is to amend the law to extend this critical extended producer responsibility program. Once extended, expanded public education and outreach, increased consumer convenience, and the addition of a financial return incentive to the existing collection program, are expected to spur an earlier-than-planned replacement of mercury thermostats still in use. Should the Act be allowed to sunset at the end of 2023, there is little doubt that collection results would continue to falter, and the management and costs of this harmful waste stream would once again fall to the State, municipalities, and taxpayers.

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