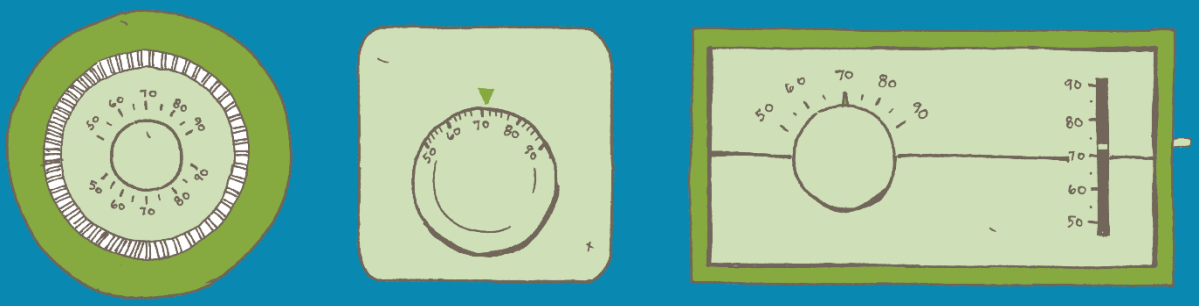
2022 ANNUAL REPORT

PENNSYLVANIA



Thermostat Recycling® CORPORATION

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THERMOSTAT RECYCLING CORPORATION GOVERNANCE

Thermostat Recycling Corporation Board Members

Arnie Meyer (Chairman)
Resideo / Honeywell Home (f/k/a Honeywell)

Charles Ketterer (Vice-Chairman)
Emerson Technologies (White Rodgers)

Bob Johnson (Treasurer)
Lennox Industries

Thermostat Recycling Corporation Dues Paying Members

Bard Manufacturing Company, Inc.	ITT Inc.
Burnham LLC	Johnson Controls
Carrier Corporation	Lennox International Inc.
Chromalox, Inc.	Google
ClimateMaster, Inc.	Nortek Global HVAC, LLC
Crane Company	Rheem Manufacturing Company
Daikin Applied (McQuay)	Schneider Electric USA, Inc.
Dwyer Instruments, Inc.	Taco, Inc.
ecobee	The Marley-Wylain Company
Empire Comfort Systems	TPI Corporation
General Electric Company	Trane Residential Systems
Goodman Distribution, Inc.	Uponor, Inc.
Ademco Inc., wholly owned subsidiary of Resideo Technologies, Inc. (Honeywell Home)	W. W. Grainger, Inc.
Hunter Fan Company	White Rodgers, a division of Emerson Electric Co.

Thermostat Recycling Corporation Staff

Ralph Vasami
Executive Vice President

Danielle Myers
Executive Director

Mariel Nelson
Operations Administrator

LETTER FROM THE EXECUTIVE DIRECTOR

As we move forward, it becomes increasingly difficult to maintain the same level of mercury thermostat collections because we continue to make strides toward eliminating every last mercury thermostat. We are dedicated to fulfilling TRC's mission to promote the safe collection and proper disposal of mercury-containing thermostats while keeping mercury out of the waste stream in order to protect the environment.

As existing regulations around manufacturer funded mercury thermostat collections sunset, we remain steadfast in our efforts and will continue to collect mercury containing thermostats in all 48 contiguous states. We appreciate that legislators recognize our decades of effort and success.

TRC will continue to target mercury thermostat collections and work with our partners in the HVAC industry, the waste sector, the energy sector, and the regulatory community to achieve positive results. As you might expect, our numbers will decrease because of our previous successes, but our diligence and dedication remain.

We are happy to provide you with this year's annual report. Please do not hesitate to contact us with comments or questions.

Sincerely,

Danielle Myers, Executive Director

Ralph Vasami, Executive Vice President

PENNSYLVANIA

2022 Collections and Evaluation

The following analytical report details the annual program performance for mercury thermostat collection in the state of Pennsylvania in 2022.

A few of the program highlights for 2022 are included below:

- In 2022 the program **collected 44.3 lbs. of mercury** in Pennsylvania. Since 2001, the annual quantity of mercury collected in Pennsylvania has averaged 74.0 lbs.
- The program collected **5,001 whole thermostats in 2022**. This was a 34% decrease over the number of thermostats collected in 2021. Since 2001, the average thermostat count per year is 7,763.
- The **number of whole thermostats collected per bin in 2022 was 41 thermostats,** a decrease from 48 in 2021**.**
- The counties with the most bins and thermostats returned in 2022 were **Allegheny County (10 bins, 510 thermostats), Delaware County (8 bins, 463 thermostats), and York County (6 bins, 460 thermostats).**
- In 2022, **31% of the partner locations returned at least one bin**.
- **A total of 210 'Miss You' calls were placed in 2022**.
- In addition to 5,001 whole thermostats, **372 loose switches were collected, bringing the total number of "thermostat equivalents" returned in 2022 to 5,276**, a decrease of 44% from 2021.

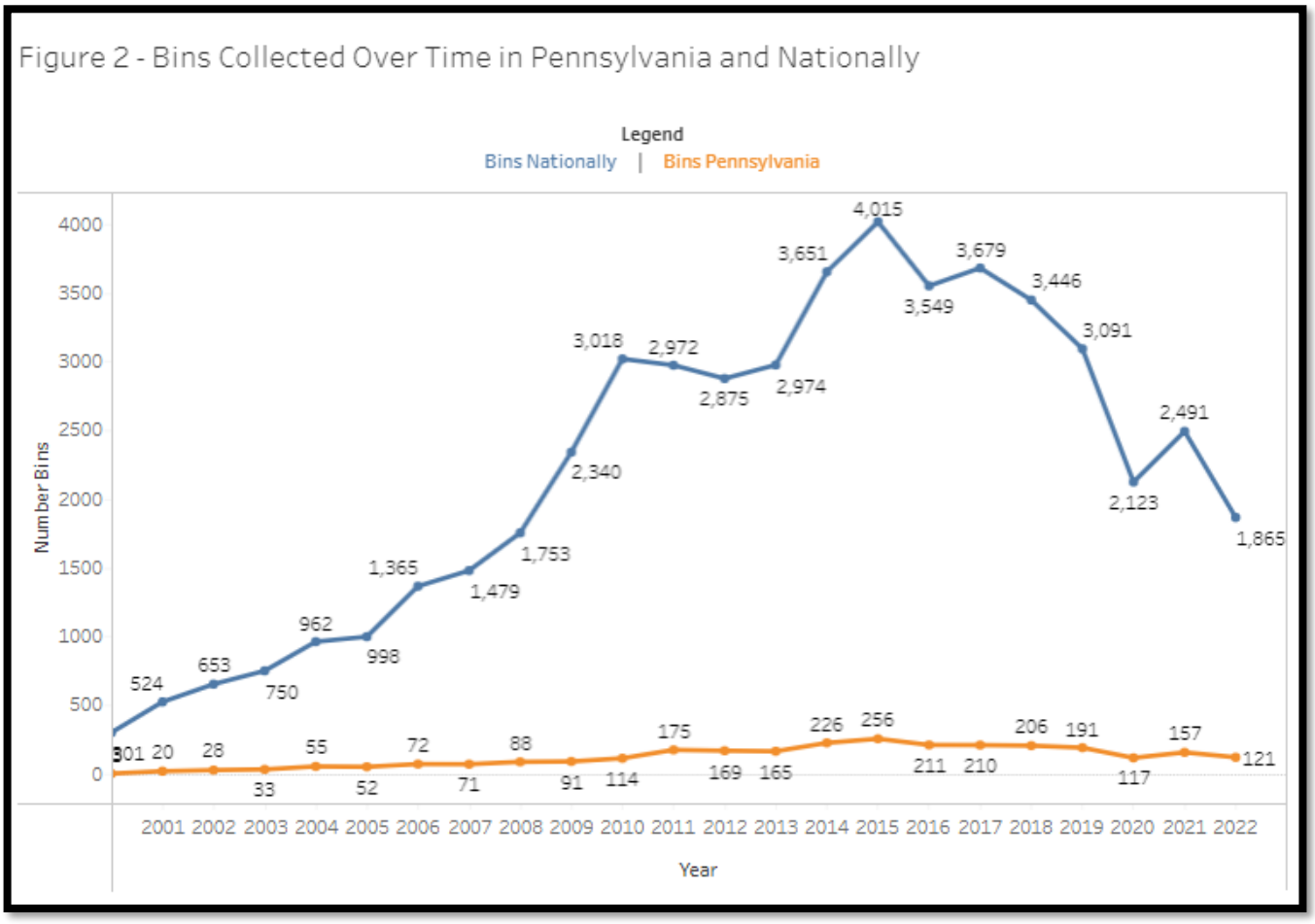
Section 1: Program Analytics

Section 1 of this report examines the annual performance of the thermostat collection recycling program in terms of bins, thermostats, and mercury collected as well as the year-over-year progression of the program. On average, the program has collected 74 lbs. of mercury and 7,763 whole thermostats per year since 2001. In 2022, the program collected 44.3 lbs. of mercury from 5,001 thermostats and 372 loose switches. Figure 1 below displays the total number of bins, the total number of thermostats, and the quantity of mercury collected in Pennsylvania since the beginning of the program.

Figure 1 - Program Performance Over Time

Year	Number Bins	Number Thermostats	Mercury (Lb)
2001	20	1,632	16.8
2002	28	2,242	25.8
2003	33	2,548	25.8
2004	55	4,632	46.2
2005	52	4,968	46.0
2006	72	7,019	59.4
2007	71	6,175	64.2
2008	88	7,560	72.2
2009	91	7,320	82.7
2010	114	9,500	99.1
2011	175	14,411	133.2
2012	169	11,406	114.8
2013	165	12,696	119.5
2014	226	14,201	133.0
2015	256	14,338	130.1
2016	211	9,676	88.8
2017	210	10,674	94.4
2018	206	9,763	92.5
2019	191	9,213	80.6
2020	117	5,733	49.4
2021	157	7,572	81.2
2022	121	5,001	44.3
Total	2,831	178,558	1,702.5
Average	123	7,763	74.0

Figure 2 displays the number of bins collected in Pennsylvania since the initiation of the collection program, as well as the total number of bins collected in the U.S. over the same period. The number of bins collected in Pennsylvania has generally increased from 2000 to 2011. In 2014, bin returns increased again, peaking with highest number of bins returned in 2015 with 256 bins. In 2022, the number of bins returned was 121 bins.



The 44.3 lbs. of mercury collected in Pennsylvania in 2022 was 45% lower than the 81.2 lbs. collected in 2021. Figure 3 displays the quantity of mercury collected in Pennsylvania over time as well as the annual percent change in Pennsylvania and nationally.

Figure 3 - Quantity (Lb) of Mercury Collected in Program and Annual Changes to Pennsylvania and Nationally

Year	Mercury (Lb)	% Change Pennsylvania	% Change Nationally
2001	16.8	570%	89%
2002	25.8	54%	14%
2003	25.8	0%	11%
2004	46.2	79%	17%
2005	46.0	0%	11%
2006	59.4	29%	32%
2007	64.2	8%	2%
2008	72.2	12%	16%
2009	82.7	14%	16%
2010	99.1	20%	26%
2011	133.2	34%	4%
2012	114.8	-14%	-5%
2013	119.5	4%	-5%
2014	133.0	11%	13%
2015	130.1	-2%	-1%
2016	88.8	-32%	-15%
2017	94.4	6%	-7%
2018	92.5	-2%	-42%
2019	80.6	-13%	5%
2020	49.4	-39%	-35%
2021	81.2	64%	5%
2022	44.3	-45%	-28%
Average	74.0		

Pennsylvania collected 5,001 thermostats in 2022. This was a 34% decrease from the number of thermostats collected in 2021. Figure 4 displays the total number of thermostats collected in Pennsylvania and nationally, and Figure 5 shares the underlying data as well as the calculated annual percent change.

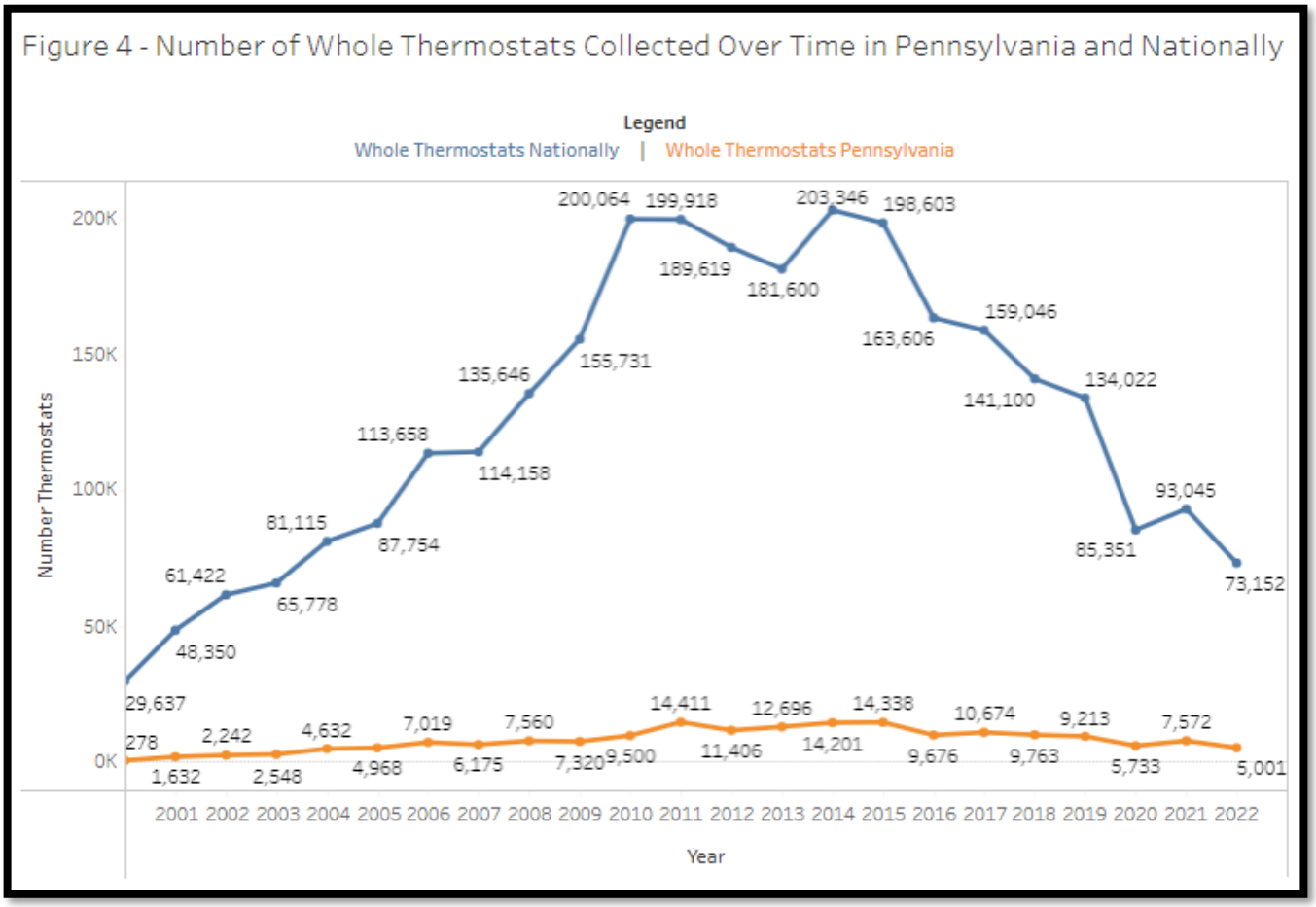
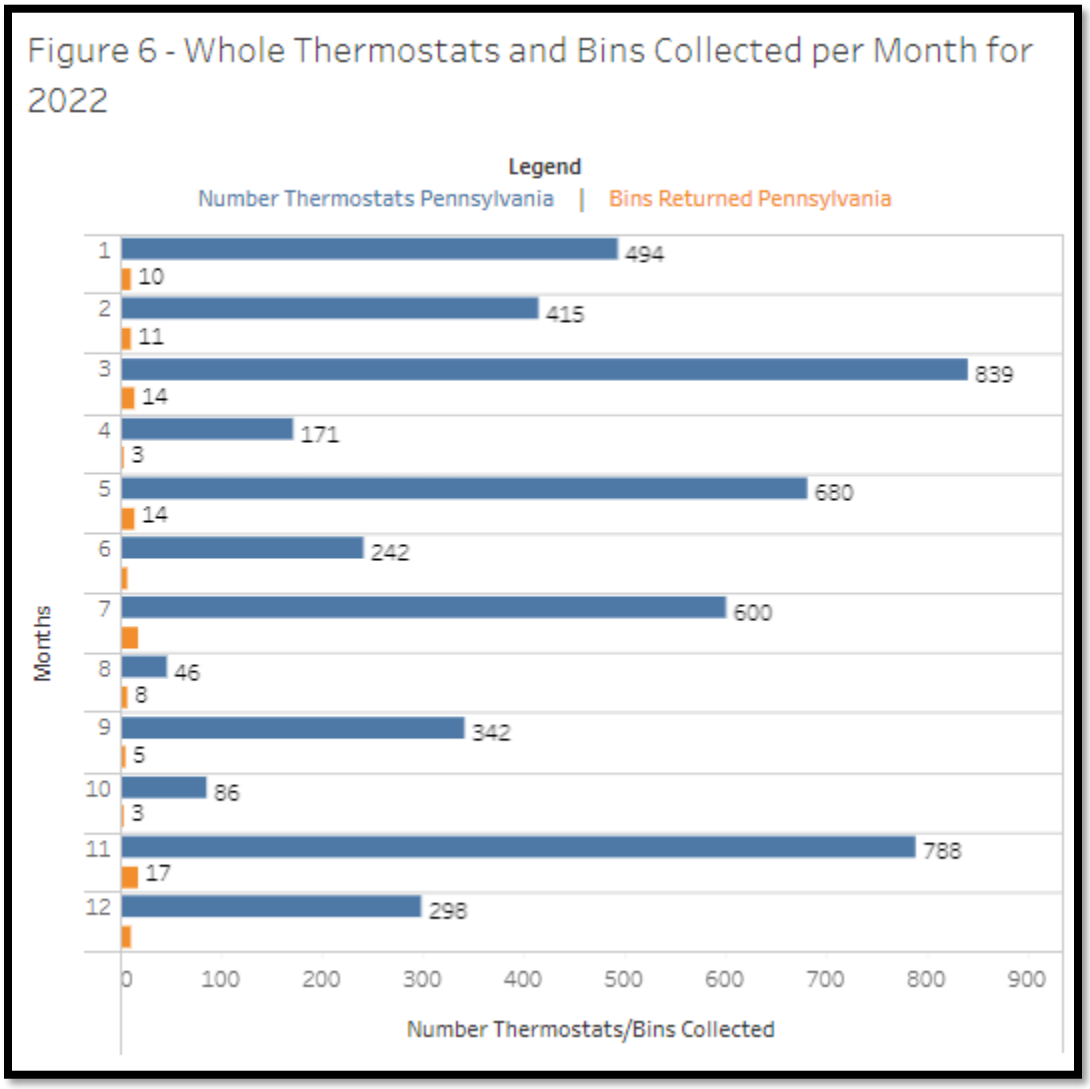


Figure 5 - Whole Thermostats Collected in Pennsylvania and Nationally Over Time and Annual Percent Change

Year	Number Thermostats	% Change Pennsylvania	% Change Nationally
2001	1,632	487%	
2002	2,242	37%	27%
2003	2,548	14%	7%
2004	4,632	82%	23%
2005	4,968	7%	8%
2006	7,019	41%	30%
2007	6,175	-12%	0%
2008	7,560	22%	19%
2009	7,320	-3%	15%
2010	9,500	30%	28%
2011	14,411	52%	0%
2012	11,406	-21%	-5%
2013	12,696	11%	-4%
2014	14,201	12%	12%
2015	14,338	1%	-2%
2016	9,676	-33%	-18%
2017	10,674	10%	-3%
2018	9,763	-9%	-11%
2019	9,213	-6%	-5%
2020	5,733	-38%	-36%
2021	7,572	32%	9%
2022	5,001	-34%	-21%
Average	7,763		

Figure 6 displays the monthly distribution of bins and thermostats collected in Pennsylvania in 2022. The months with the greatest number of thermostats returned were March (839 thermostats, 14 bins) and November (788 thermostats, 17 bins). The month with the greatest number of bins returned was November (17 bins). Conversely, the month with the least activity in 2022 was October.



The highest number of thermostats per bin returned occurred in September (68.4 thermostats per bin each month). Figure 7 shows the average number of thermostats per bin returned per month for the year.

Figure 7 - Average Thermostats per Bin Returned per Month for 2022

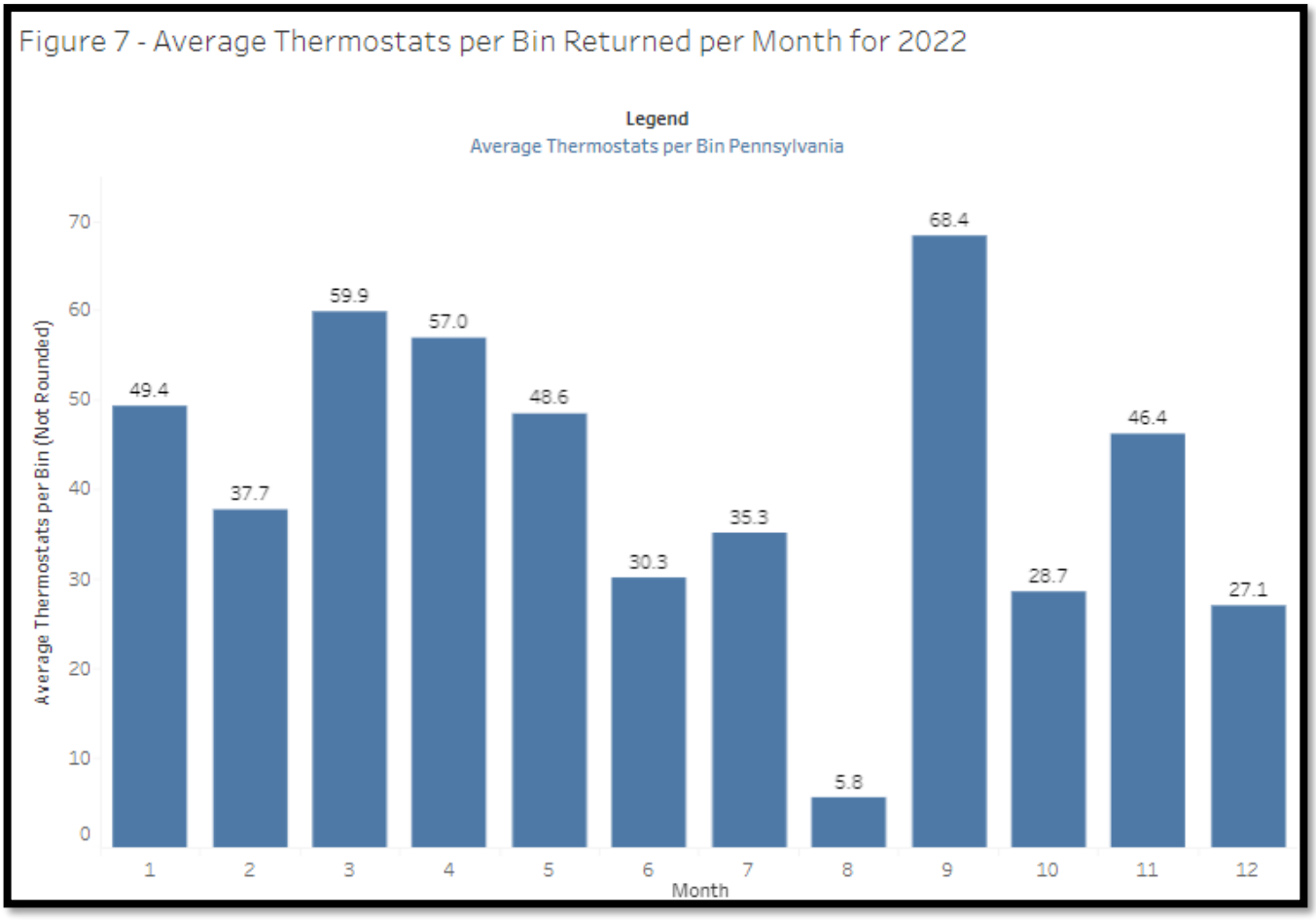


Figure 8 displays the average number of thermostats returned per bin in Pennsylvania and in the U.S. since the beginning of the Pennsylvania program. Nationally, the number of thermostats per bin has been decreasing annually since 2000. In Pennsylvania a similar pattern is observed, with the exception of a few years. The number of thermostats per bin in 2022 (41 thermostats per bin avg.) decreased from 2021 (48 thermostats per bin avg.).

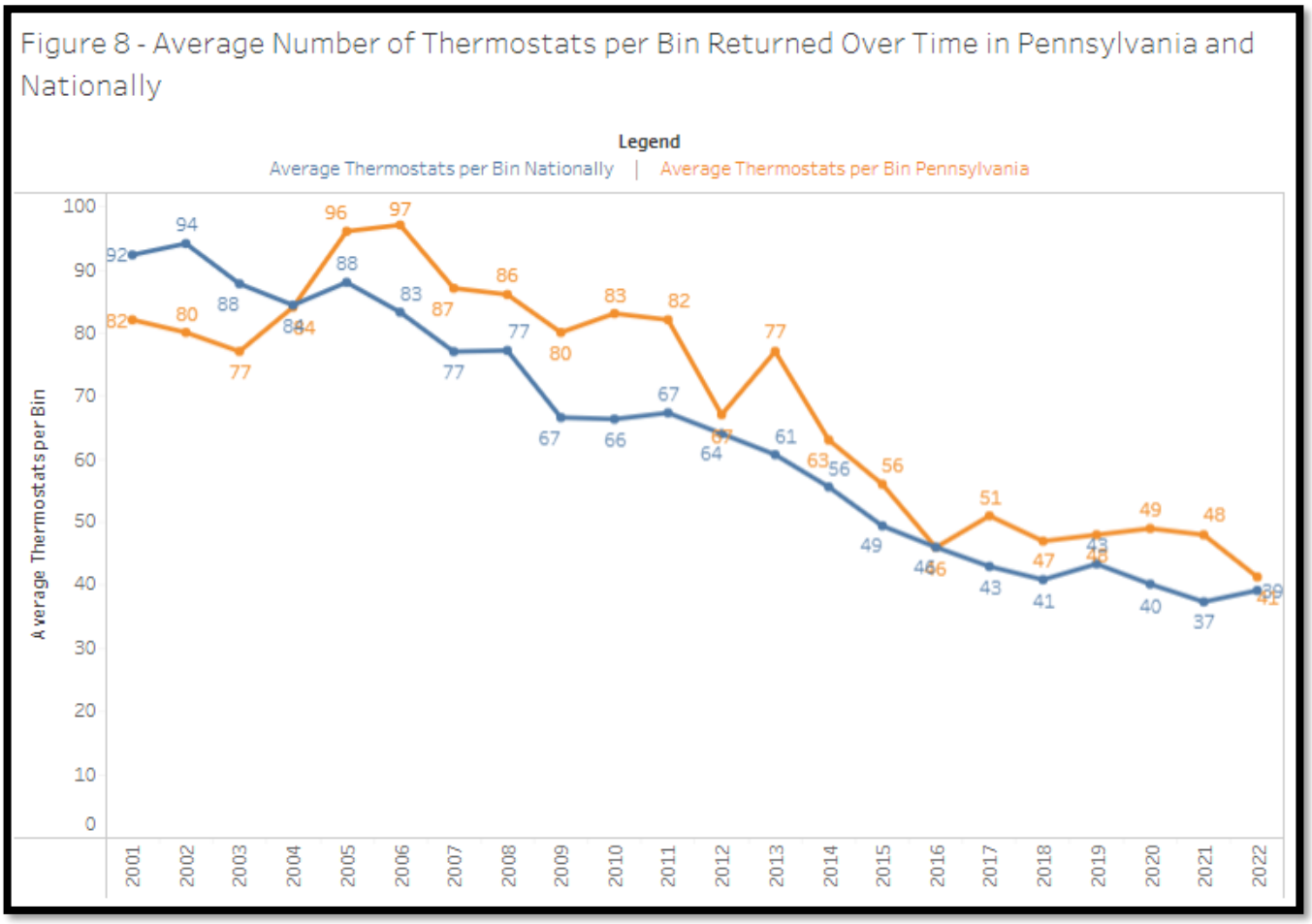
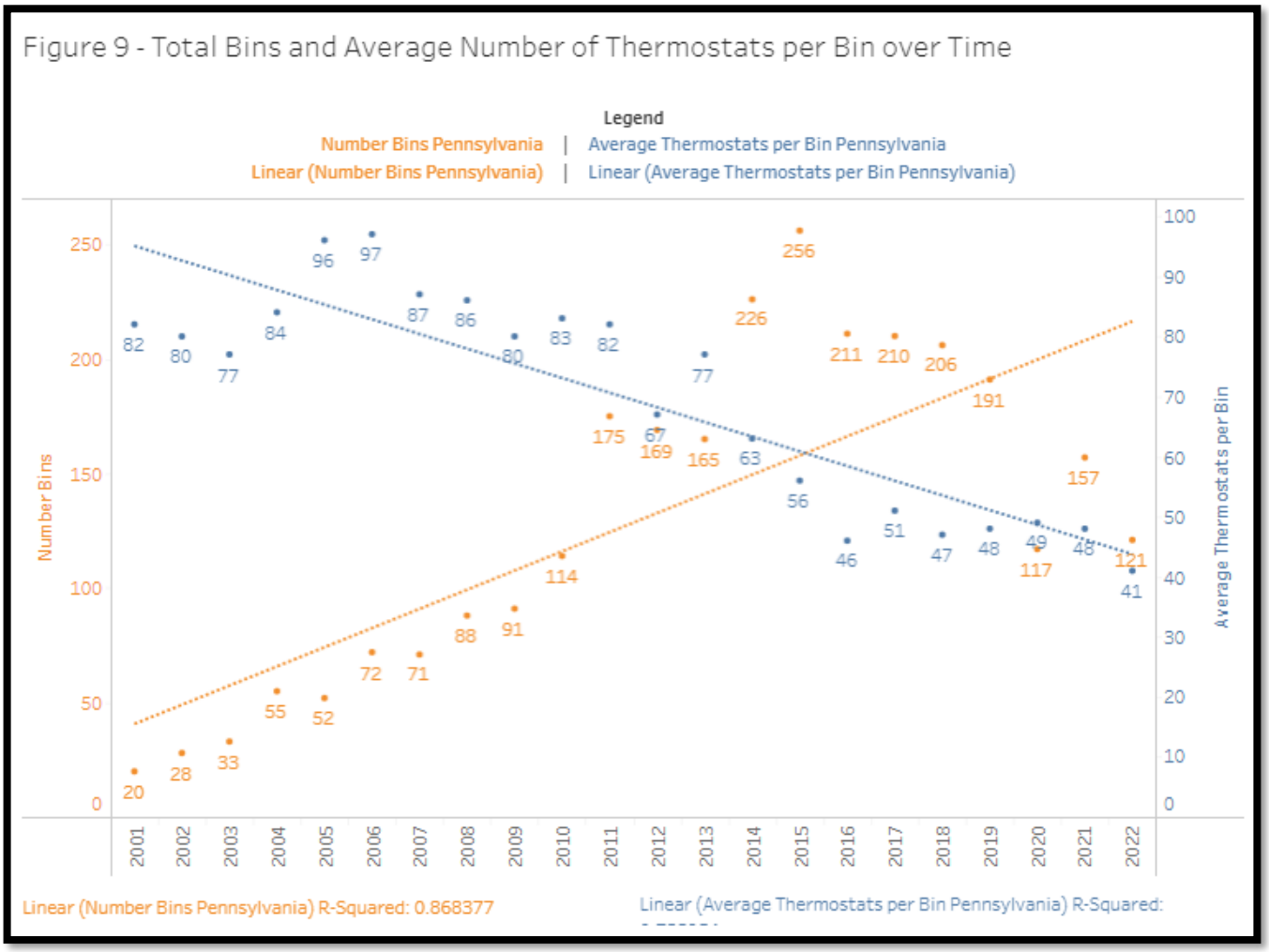
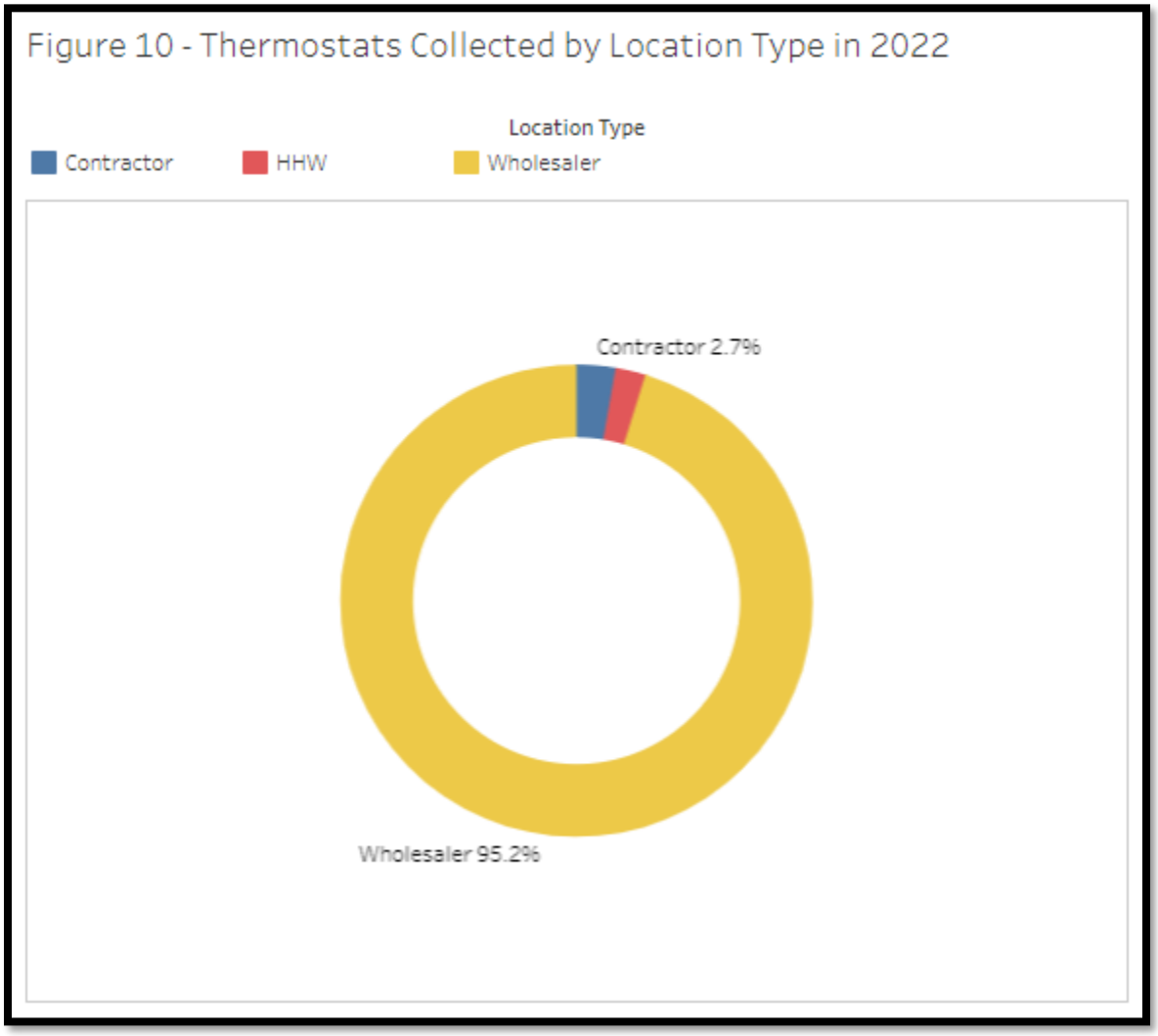


Figure 9 plots the total bins returned over time along with the average number of thermostats per bin over the same period. In general, the number of bins returned in Pennsylvania increased steadily from 2000 to 2015. At the same time, thermostats per bin generally grew until 2006, after which the trend in thermostats per bin dropped. A negative correlation has been identified between the number of bins returned and the number of thermostats per bin.

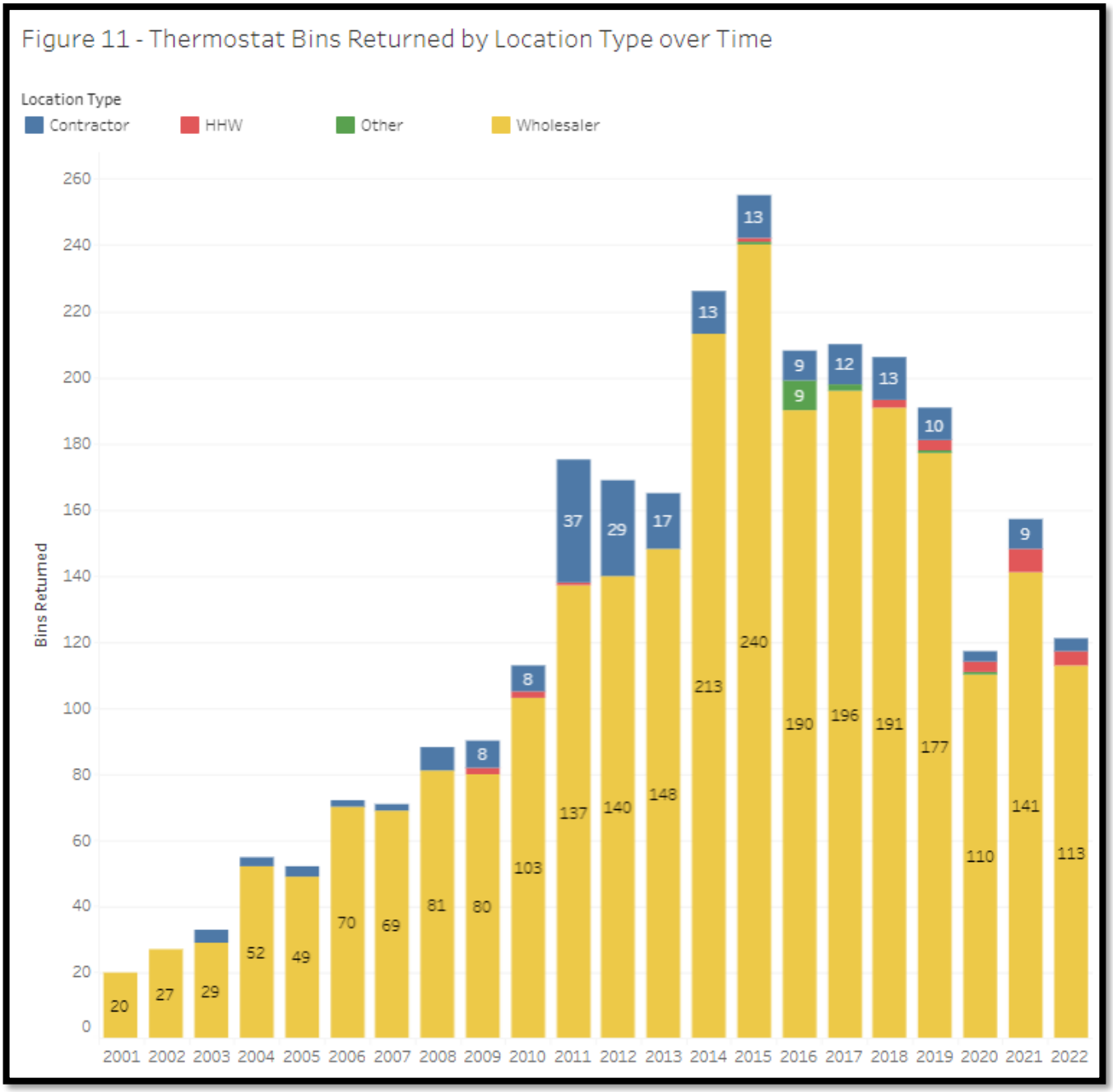


SECTION 2: Channel Partner Analysis

Section 2 of the report examines the partner locations in more detail. Most thermostats collected in Pennsylvania were through wholesalers (95.2%) with the remaining thermostats collected by contractors and HHWs. Figure 10 shows the distribution of thermostats collected by location type in 2022.



The number of bins returned in 2022 decreased across wholesalers, HHWs and contractors from 2021 levels. Figure 11 displays the change in the number of bins returned by thermostat collection type over time in Pennsylvania.



In 2022, 30% of Pennsylvania locations possessing a collection bin sent back at least one bin for recycling. The distribution is displayed in Figure 12.

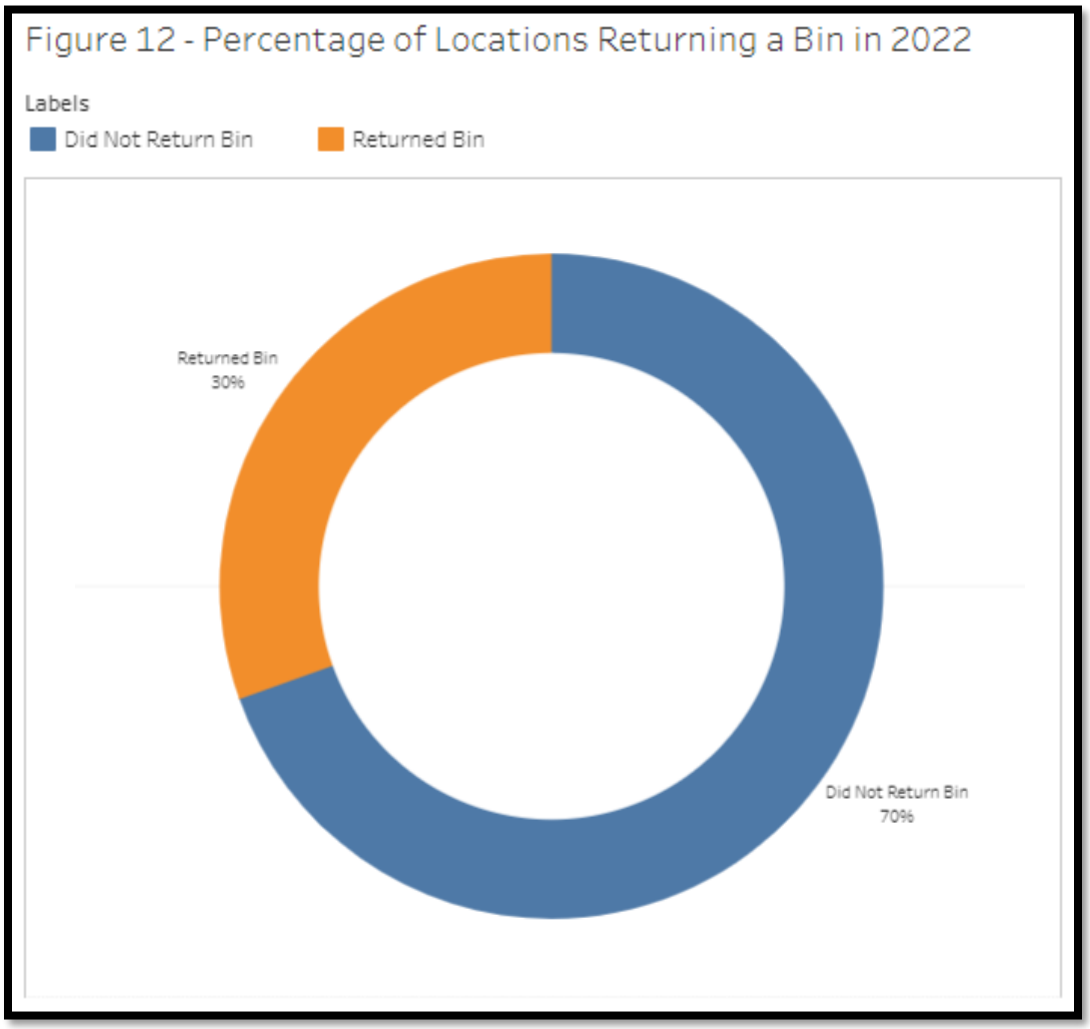


Figure 13 displays the total bins and thermostats returned by county in 2022. An analysis of the top performing counties revealed that Allegheny County (10 bins, 510 thermostats), Delaware County (8 bins, 463 thermostats), and York County (6 bins, 460 thermostats) returned the greatest number of bins and thermostats in 2022.

Figure 13 - Bins Returned and Total Thermostats Returned 2022 by County

	Number Thermostats	Number Bins
Allegheny	510	10
Delaware	463	8
York	460	6
Lancaster	362	7
Montgomery	357	6
Chester	303	8
Philadelphia	230	9
Berks	225	4
Luzerne	203	4
Lehigh	172	7
Mercer	164	2
Northampton	161	2
Bucks	155	6
Lebanon	131	2
Erie	128	3
Butler	115	3
Crawford	115	1
Franklin	111	2
Fayette	73	1
Centre	69	3
Westmoreland	69	3
Dauphin	63	3
Cumberland	54	3
Blair	46	3
Mifflin	43	1
Indiana	36	1
Monroe	32	2
Adams	25	3
Cambria	25	1
Lackawanna	9	3
Somerset	9	1
Washington	7	1

TRC partner R. E. Michel (1,642 thermostats) returned the highest number of thermostats in Pennsylvania in 2022, followed by Johnstone Supply (961 thermostats) and APR Supply (455 thermostats). Apart from these locations, two program partners returned more than 300 thermostats each. Figure 14 displays the top performers in terms of total thermostats returned in 2022.

Figure 14 - Top 10 Performing TRC Partners in Pennsylvania

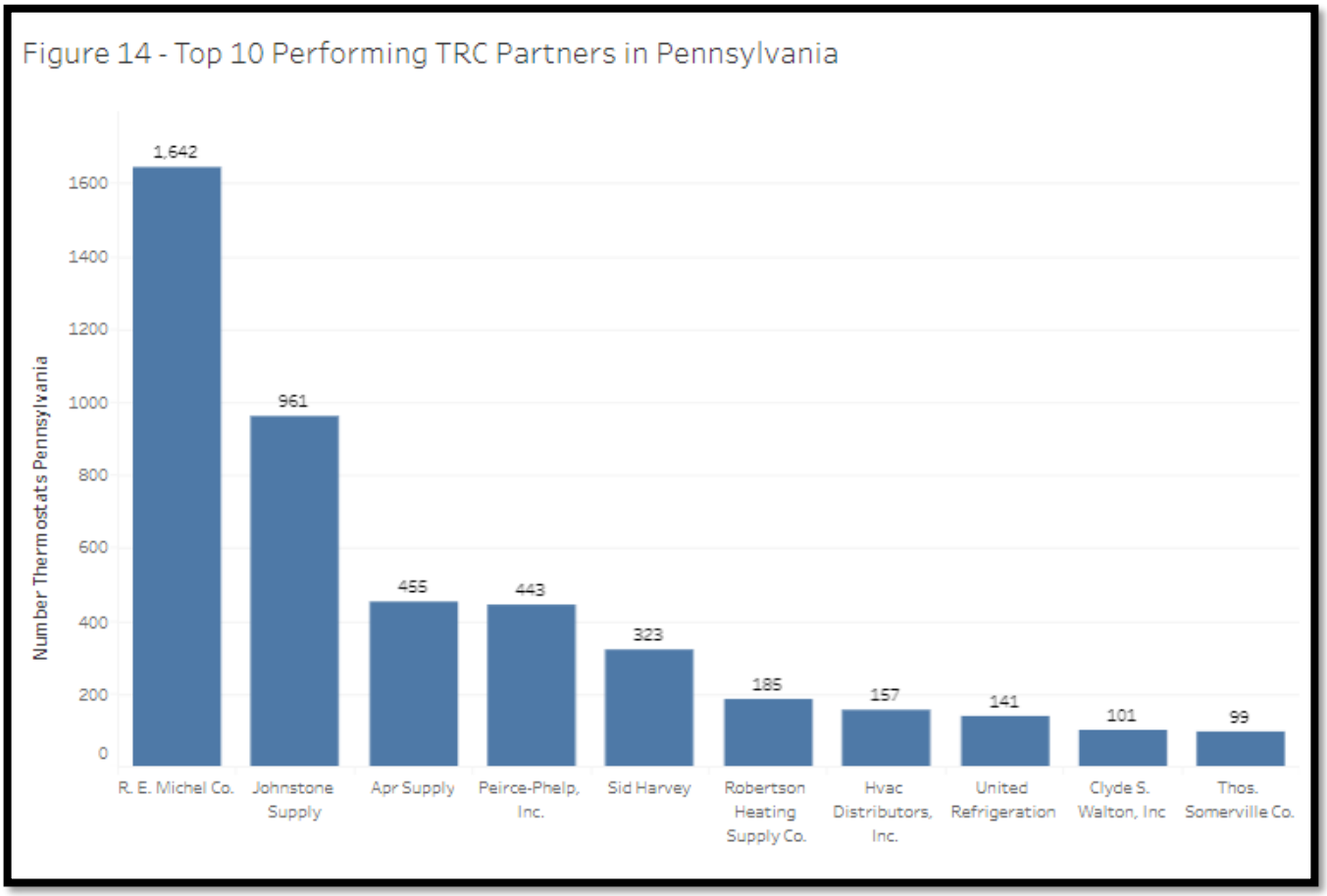


Figure 15 includes the top performers for 2022 by each of the following categories: total bins returned, total thermostats returned, and average number of thermostats per bin.

Figure 15 - Top 10 Performing Partners by Total Bins, Total Thermostats, and Average Thermostats per Bin

	Number Thermostats	Number Bins	Average Thermostats per Bin
R. E. Michel Co.	1,642	26	63
Johnstone Supply	961	17	57
Apr Supply	455	11	41
Peirce-Phelp, Inc.	443	6	74
Sid Harvey	323	6	54
Robertson Heating Supply Co.	185	4	46
Hvac Distributors, Inc.	157	3	52
United Refrigeration	141	11	13
Clyde S. Walton, Inc	101	1	101
Thos. Somerville Co.	99	2	50

TRC conducted several activities in 2022 to increase the number of bins and thermostats returned in Pennsylvania. These activities included 'miss you' calls to collection locations that may not have returned a bin recently. In 2022, there were no site visits completed. Figure 16 displays the relationship between the number of site visits per month, the bins returned per month, and the number of thermostats (in 100's) returned per month.

Figure 16 - Relationship Between Site Visits and Bins and Thermostats Returned Per Month in 2022

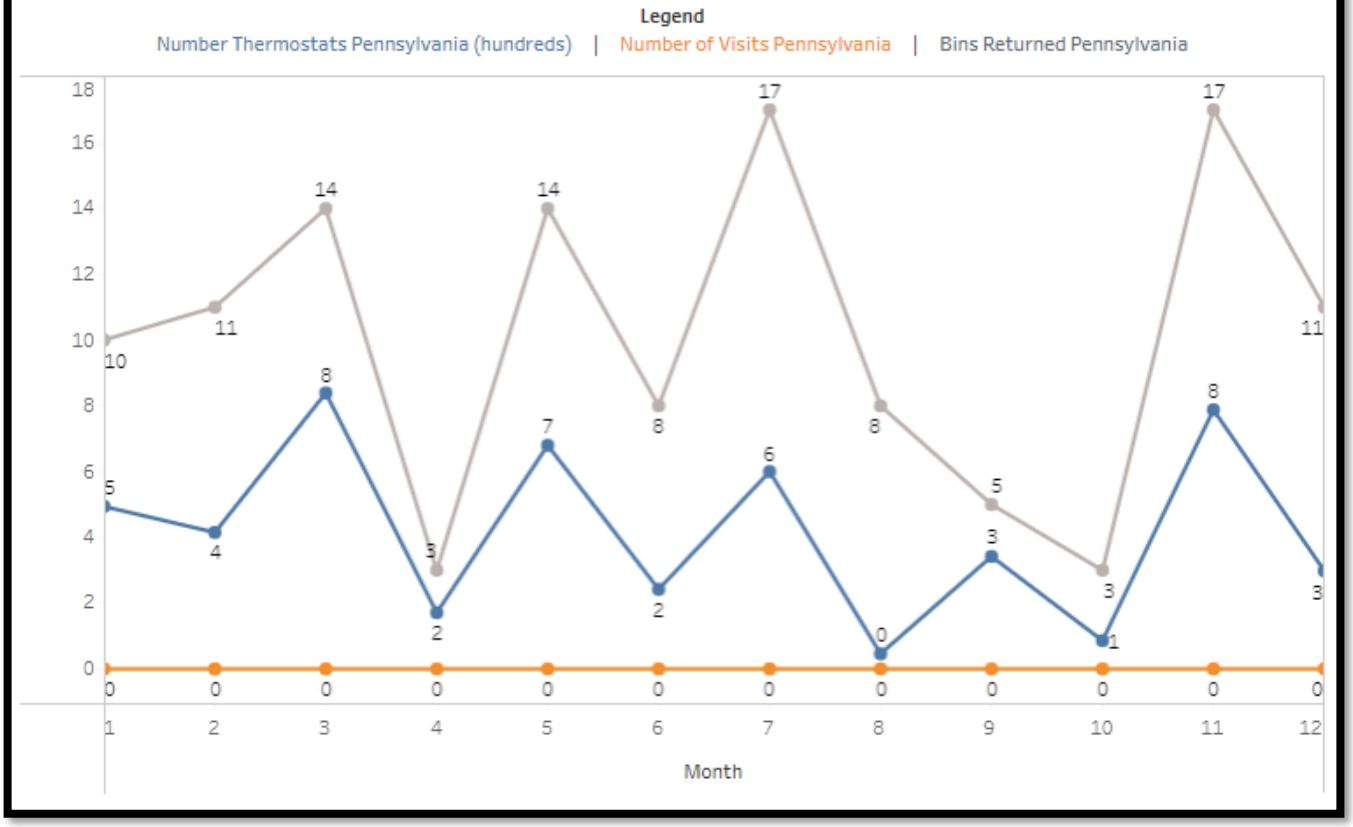
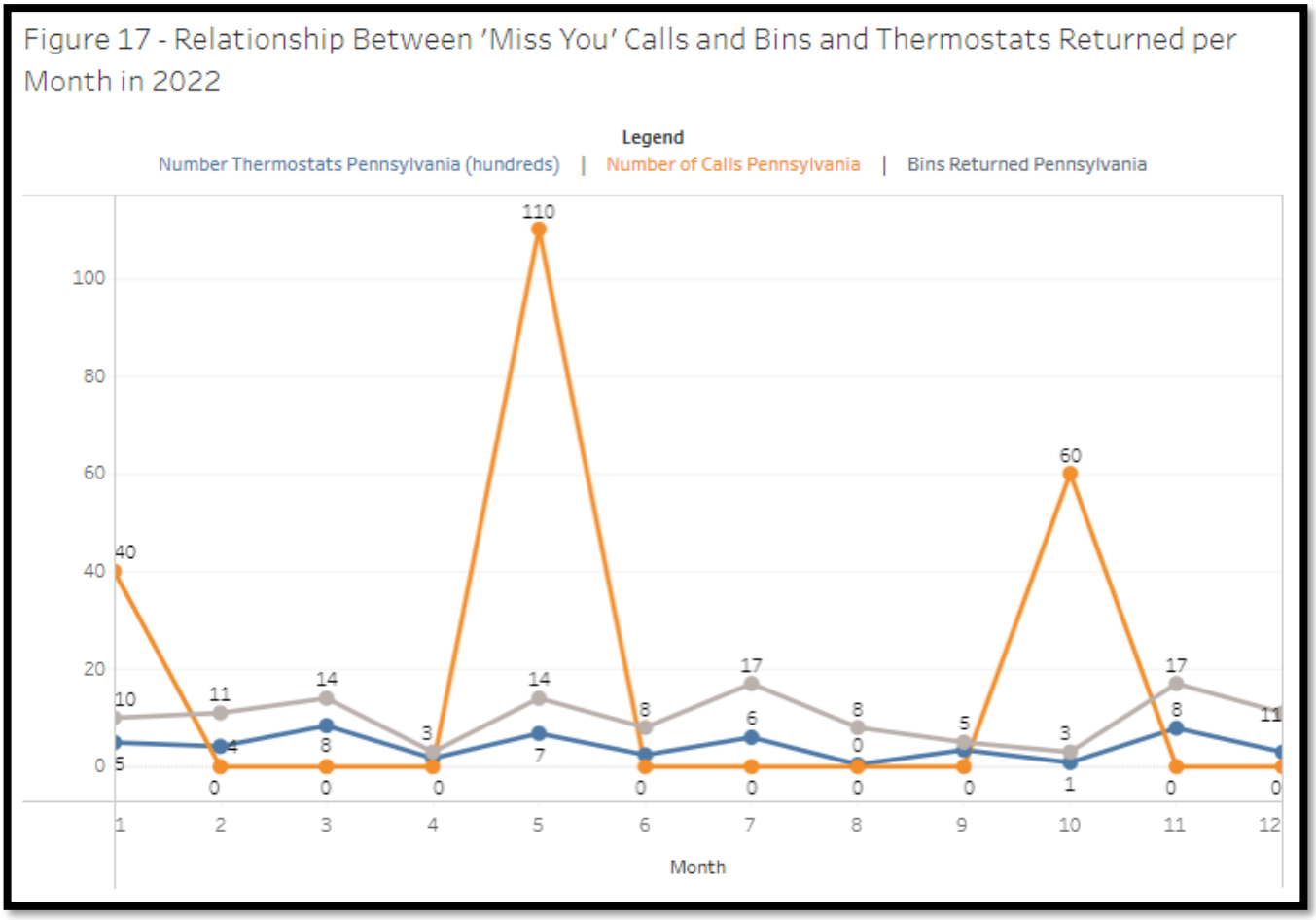


Figure 17 displays the relationship between the number of calls per month, the bins returned per month and the number of thermostats (by 100's) returned per month. In 2022, a total of 210 'miss you' calls were placed. Calls were placed in the months of January, May, and October.

Figure 17 - Relationship Between 'Miss You' Calls and Bins and Thermostats Returned per Month in 2022



SECTION 3: Comparisons to National and Other States' Data

To compare how the Pennsylvania collection partners performed in 2022, the national average for the number of bins returned per location that returned at least one bin was calculated and compared to the Pennsylvania average since 2012. The average number of bins does not include locations that did not return any bins in that year. It should be noted that when making comparisons each state has different regulations, a different mix of housing types, local policies, and incentives that may have a unique impact on returns. Overall, the average number of bins returned per location per year was lower in Pennsylvania than the U.S. average, as shown in Figure 18.

Figure 18 - Average Number of Bins Returned Per Location Per Year

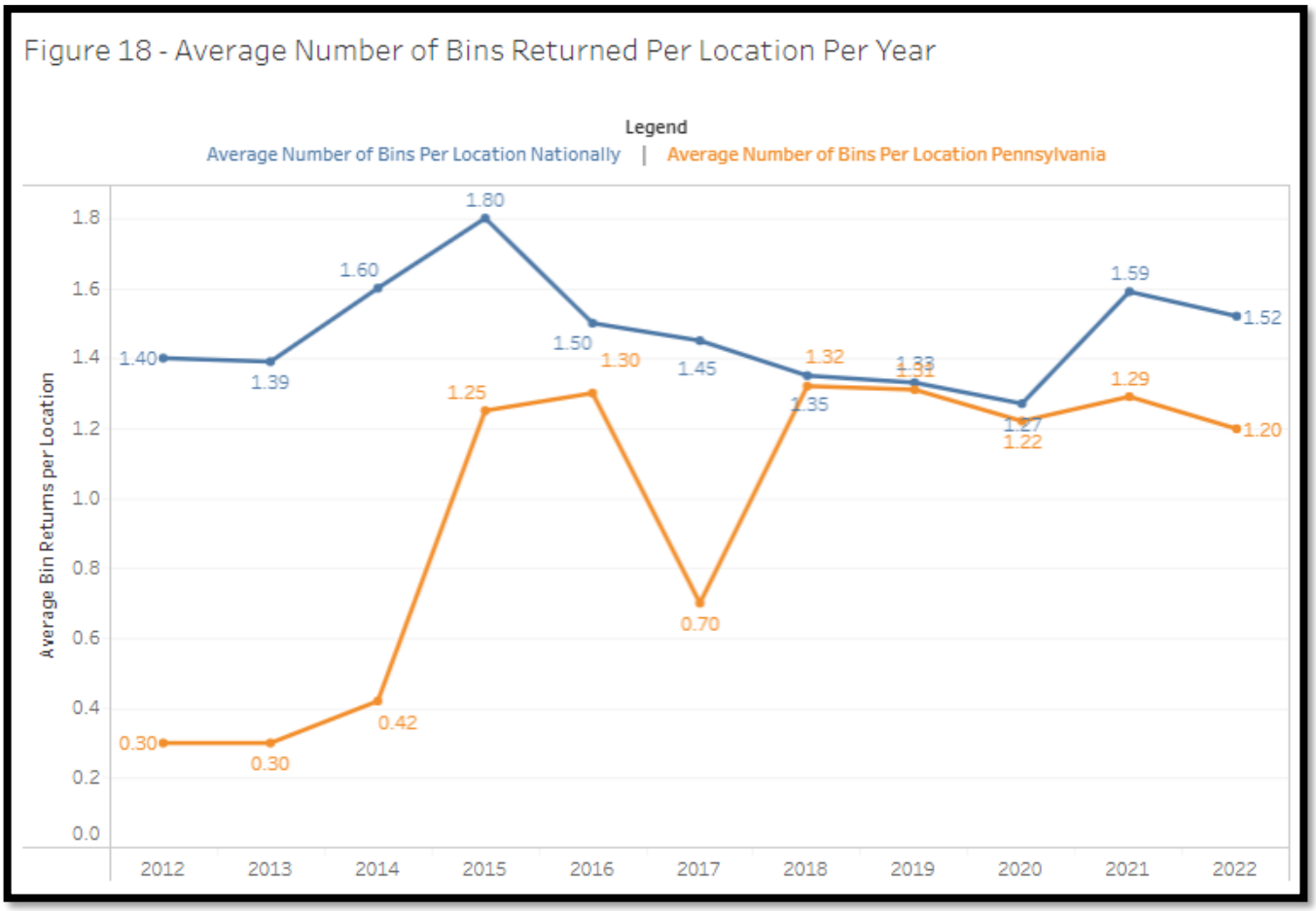


Figure 19 displays the locations in Pennsylvania that returned more than one bin in a given year since 2019, and Figure 20 displays the top 10 partners in the U.S. over the same period in terms of the number of bins returned.

Figure 19 - Partner Locations in Pennsylvania Returning More than 1 Bin per Last 4 Years

2019

R.E. Michel Co.	42
Johnstone Supply	20
United Refrigeration	15
Apr Supply	11
Hvac Distributors, Inc.	10
Ferguson	9
Meier Supply Company, Inc.	7
Johnson Controls	6
Robertson Heating Supply Co.	5
Us Supply	5
Lennox	4
Peirce-Phelp, Inc.	4
Grove Supply Inc.	3
Clyde S. Walton, Inc	2
R.F. Fager Co.	2
Refrigeration Sales Corp	2
Riley Sales	2

2020

R. E. Michel Co.	31
Johnstone Supply	18
Apr Supply	9
United Refrigeration	9
Ferguson	5
Lennox	4
Peirce-Phelp, Inc.	4
Hvac Distributors, Inc.	3
Robertson Heating Supply Co.	3
Trane	3
Grove Supply Inc.	2
Sid Harvey	2
Thos. Somerville Co.	2
Us Supply	2

2021

R. E. Michel Co.	41
Johnstone Supply	19
United Refrigeration	13
Apr Supply	10
Meier Supply Company, Inc.	7
Johnson Controls	5
Hvac Distributors, Inc.	4
Lennox	4
Sid Harvey	4
R.F. Fager Co.	3
Allentown Recycling & Solid Waste	2
Bucks County Planning Commission	2
Epsco	2
Ferguson	2
Goodman Distribution	2
Grove Supply Inc.	2
Hannabery Hvac	2
Robertson Heating Supply Co.	2
Thos. Somerville Co.	2
Tom Antonelli Inc	2
Trane	2
Us Supply	2

2022

R. E. Michel Co.	26
Johnstone Supply	17
Apr Supply	11
United Refrigeration	11
Peirce-Phelp, Inc.	6
Sid Harvey	6
Ferguson	4
Robertson Heating Supply Co.	4
Associated Refrigeration Inc. (ARI)	3
Grove Supply Inc.	3
Hvac Distributors, Inc.	3
Goodman Distribution	2
Meier Supply Company, Inc.	2
Thos. Somerville Co.	2
Trane	2

Figure 20 - Top 10 Performing Partner Locations Nationwide in Bins Returned Last 4 Years

2019

Johnstone Supply	374
R. E. Michel Co.	229
United Refrigeration	155
Ferguson	106
Lennox	89
Us Air Conditioning Distri..	68
Goodman Distribution	64
Wheelabrator	62
Refrigeration Supplies Di..	53
Watsco	51

2020

Johnstone Supply	247
R. E. Michel Co.	158
United Refrigeration	87
Ferguson	72
Us Air Conditioning Distri..	56
Lennox	47
Sid Harvey	36
F.W. Webb	30
Wheelabrator	22
Rise Engineering	13

2021

Johnstone Supply	303
R. E. Michel Co.	190
United Refrigeration	123
Ferguson	69
Lennox	60
Goodman Distribution	46
Refrigeration Supplies Di..	39
Watsco	38
F.W. Webb	37
Us Air Conditioning Distri..	37

2022

Johnstone Supply	246
R. E. Michel Co.	157
United Refrigeration	80
Ferguson	46
Us Air Conditioning Distributors (USACD)	43
Lennox	42
Refrigeration Supplies Distributor (RSD)	42
Watsco	35
Sid Harvey	32
F.W. Webb	31

Figure 21 displays total percentage of locations that actively participated in the program (active participation defined as sending back at least one bin) in 2022, for all the states that mandate thermostat returns reporting as well as the U.S. national average for all states (reporting and non-reporting). In 2022, 31% of the locations in PA returned at least one bin compared to a national average of 34%. The highest percentage of locations returning a bin in 2022 amongst states that mandate thermostat returns reporting was Minnesota (45%).

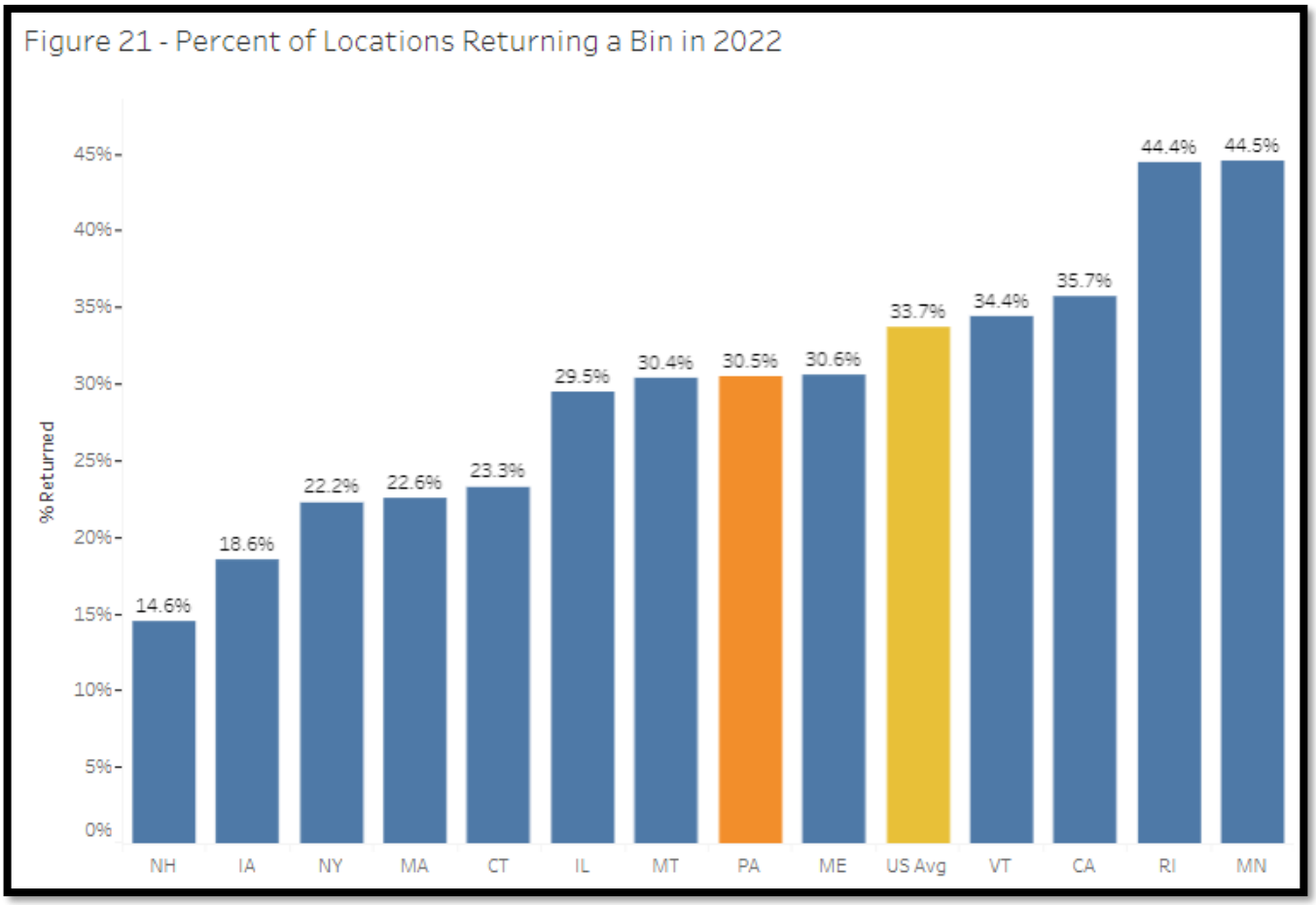


Figure 22 compares the Pennsylvania and national rates for several analytics. These include: total whole thermostats, bins, and loose switches collected, number of thermostats collected by total locations and per actively participating locations, number of thermostats per bin returned on average, equivalent average, number of mercury thermostat equivalents returned in 2022, and finally percent change in mercury thermostat conversion from 2021 to 2022. The equivalent average is an average of the number of switches in whole thermostats collected in Pennsylvania, and it is used to represent an equivalent number of thermostats from returned loose switches. The thermostat equivalent number includes the total of whole thermostats returned plus the number of thermostats estimated from loose switches. The states displayed are those that mandate thermostat returns reporting and the U.S. average is for all states that return bins (reporting and non-reporting).

Figure 22 - Comparison of States and US Average Among Several Categories

State	Whole Thermosta	Bins	Loose Switches	Thermosta returned per total # of locations with bins	Average Thermosta per bin	Average Thermosta collected per location that returned	Equivalent Average	Thermosta Equivalent in 2022	% Change over previous year
CA	6,473	356	781	8	18	16	1.6300	6,952	-46%
CT	2,216	55	165	11	40	29	1.1489	2,360	-27%
IA	1,505	30	391	13	50	33	1.3030	1,805	76%
IL	2,508	114	39	7	22	12	1.1248	2,543	-69%
MA	8,333	112	11	26	74	90	1.1048	8,343	37%
ME	2,282	68	10	12	34	27	1.0960	2,291	-51%
MN	4,571	74	4,362	35	62	59	1.1665	8,310	0%
MT	352	8	0	15	44	70	1.1733	352	-47%
NH	812	28	7	4	29	20	1.1281	818	-37%
NY	3,327	121	1,337	7	27	19	1.2834	4,369	10%
PA	5,001	121	372	15	41	32	1.3551	5,276	-44%
RI	1,425	28	132	32	51	42	1.0681	1,549	-35%
VT	1,396	68	0	9	21	18	1.0946	1,396	-31%
US Avg	1,524	39	242	18	39	21	1.3270	1,706	-1%

Figure 23 further compares this state and national data by showing how each state ranked in each of these categories, from highest to lowest. The states compared are those that mandate thermostat returns reporting and the U.S. average is for all states that return bins (reporting and non-reporting).

Figure 23 - Comparison of States and US Average Among Several Categories, Rankings

	Whole Thermostats	Bins	Loose Switches	Thermostats returned per total # of locations with bins	Average Thermostats per bin	Average Thermostats collected per location that returned at least one bin in 2022	Equivalent Average	Thermostat Equivalents in 2022	% Change over previous year
1	MA	CA	MN	MN	MA	MA	CA	MA	IA
2	CA	NY	NY	RI	MN	MT	PA	MN	MA
3	PA	PA	CA	MA	IA	MN	US Avg	CA	NY
4	MN	IL	IA	US Avg	RI	RI	IA	PA	MN
5	NY	MA	PA	MT	MT	IA	NY	NY	US Avg
6	IL	MN	US Avg	PA	PA	PA	MT	IL	CT
7	ME	ME	CT	IA	CT	CT	MN	CT	VT
8	CT	VT	RI	ME	US Avg	ME	CT	ME	RI
9	US Avg	CT	IL	CT	ME	NH	NH	IA	NH
10	IA	US Avg	MA	VT	NH	US Avg	IL	US Avg	PA
11	RI	IA	ME	CA	NY	NY	MA	RI	CA
12	VT	NH	NH	IL	IL	VT	ME	VT	MT
13	NH	RI	VT	NY	VT	CA	VT	NH	ME
14	MT	MT		NH	CA	IL	RI	MT	IL

2022 Collections by Brand

In Pennsylvania, Thermostat Recycling Corporation (TRC) recovered the equivalent of 5,276 mercury thermostats from 5,001 whole mercury thermostats plus 372 mercury switches removed from thermostats. A total of 44.3 pounds of mercury was diverted from solid waste. *Please note the explanation of the converted thermostats or thermostat equivalents below.[1] An example of the mercury ampoule is shown below.

As required by the state statute, a table of thermostat brand holders with their corresponding thermostats, the number of switches and the pounds of mercury recycled is below. It is important to note that there remain non-members whose thermostats the TRC collection program recycles. They are listed in the table as "Non-Member Brands".

[1] A mercury thermostat contains a variable amount of mercury ampoules or "switches" attached to the subbase of the thermostat. These glass ampoules often are collected in the recycling container without the intact thermostat attached to them. TRC collects and counts these loose ampoules and recycles them. To derive the converted thermostat or thermostat equivalent, the program takes the following calculations to develop the converted thermostat or thermostat equivalent. First, TRC will count the total whole (intact) thermostats collected in the recycling bins. From these units, there is an intact ampoules count. TRC then takes the intact ampoules divided by the whole (intact) thermostats or otherwise known as the conversion ratio. After the conversion ratio is calculated, TRC will multiple the loose mercury switches by the conversion ratio. Lastly, we add this result to the whole (intact) thermostats to produce the converted thermostats or thermostat equivalents.

Brand Holder	Thermostats	Count Switches	Pounds of Mercury
Bard Manufacturing Corporation	0	0	0
Burnham Holdings, Inc	0	0	0
Carrier Corporation	21	52	0
Chromalox	0	0	0
Climate Master, Inc.	0	0	0
Crane Company	0	0	0
Daikin Applied	0	0	0
Dwyer Instruments	0	0	0
ecobee	0	0	0
Emerson Electric Corporation/White Rodgers	368	393	2
Empire Comfort Systems	0	0	0
General Electric Corporation	41	91	1
Goodman Global	16	32	0
Honeywell Home	4321	5705	35
Hunter Fan Company	1	1	0
ITT Corporation	3	5	0
Lennox International Inc.	46	98	1
Marley-Wylain Company	0	0	0
Nest	0	0	0
Nortek Global HVAC	7	15	0
Rheem Manufacturing Company	7	14	0
Schneider Electric (Invensys Controls)	18	18	0
STLPC Corporation (f/k/a Lux Products Corporation)	3	5	0
Taco Comfort Solutions	0	0	0
TPI Corporation	0	0	0
Trane Residential Systems	136	318	2
Uponor, Inc.	0	0	0
Vaillant Corporation	0	0	0
W. W. Grainger	0	0	0
York/Johnson Controls	10	27	0
Non-Member Brands			
American Stabilis	3	3	0
NOM (Manufacturer not identifiable)			
Loose Switches	0	372	2
Total	**5001**	**7149**	**44**

2022 Summary of the Program Expenses

Below is a summary of program expenses for the Pennsylvania collection program in 2022. 2022 program expenses (reported in the annual report) are unaudited and are for management purposes only. Prior to submittal of this annual report, the expenses were reviewed by Kellen Company.

Program Component	2021	2022	Difference
Direct Expense for Marketing & Outreach	$ 6,480.00	$ -	$ (6,480.00)
Incentive/Promotional Payments			$ -
Legal			$ -
New Collection Containers			$ -
Recycling Costs	$ 30,984.97	$ 18,980.06	$ (12,004.91)
Travel			$ -
TRC Staff & Administration	$ 500.00	$ 400.00	$ (100.00)
Total Expenses	**$ 37,964.97**	**$ 19,380.06**	**$ (18,584.91)**

2022 PENNSYLVANIA ANNUAL REPORT

Thermostat Recycling Corporation Headquarters

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Questions about this annual report?

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All state specific annual reports are posted on our website at the following weblink:

https://thermostat-recycle.org/program-info/state-reports/

APPENDICES

How Mercury Thermostat Waste is Handled

Thermostat Recycling® CORPORATION

355 Lexington Avenue - 15th Floor | New York, NY 10017 | thermostat-recycle.org

HOW MERCURY THERMOSTAT WASTE IS HANDLED

WASTE MERCURY-ADDED THERMOSTAT MANAGEMENT THROUGH VEOLIA ES TECHNICAL SOLUTIONS, LLC.

TRC containers with waste mercury-switch thermostats are received at a fulfillment/ inventory center in Port Washington, Wisconsin (WIR000130591). The facility is owned and operated by Veolia ES Technical Solutions, L.L.C. (Veolia) under contract with TRC.

All recycling containers, including pails and bins are received at the loading dock and sent to the TRC inventory room. The container and plastic liner are opened and the contents are identified, sorted, and tallied. The following data is recorded for each bin returned and processed: bin number, business name (location name), city, state, zip code, date returned, number of thermostats and mercury switches by manufacturer and any non-conforming material.

The containers are returned to the location that sent it in with a new prepaid address label within 3 weeks of receipt. The thermostats are stored and staged in a plastic lined carton in a storage area for final processing. The containers are dated and processed in order received, first in-first out.

The thermostats and any loose bulbs collected from the containers are consolidated into a special 55-gallon drum which is labeled and dated according to regulations. The drum is sealed with a band and is only opened when contents are being added to it. Special negative pressure venting assures any fumes are captured and vented when the drum is opened.

The 55-gallon drum is then shipped to Veolia's mercury recovery facility (WID988566543) for final processing of the mercury ampules (switches). Veolia Environmental Services meets or exceeds all local, state, federal and EPA regulations for the management of the product.

The containers are returned from the storage area to the mercury recovery processing area to have the mercury bulbs removed from the plastic housing. Universal Waste Regulations require the recycling and disposal of waste within 12 months of acceptance at the processing facility.

Small quantities of thermostats are removed from the container, which is then closed again. The bulbs are removed from the thermostats and placed into processing vessel at the work station. Once the processing vessel is full, the vessel is loaded into the mercury recovery retort oven.

If a bulb breaks and the mercury spills, the work area is designed to contain the spillage and the operators are trained in the clean-up and disposal of mercury. The TRC inventory

and processing areas are equipped with special mercury vacuum cleaners and the work area is vacuumed at the end of the work day to ensure that any spillage is cleaned up and not left to evaporate.

Veolia meets or exceeds all local, state, federal and EPA regulations for the management of the product. The mercury recovery facility and process are permitted by the Wisconsin Department of Natural Resources. Veolia's approvals for mercury recovery/recycling include:

- EPA - identification WID988566543
- Hazardous Waste Storage License #6008
- Hazardous Waste Treatment License (Mercury Recovery Operations) #4585
- Air Operation Permit #246076050-S01
- Storm Water General Permit #WI-S067857-4

In addition to the regulatory permits, both Veolia Port Washington facilities have developed and maintain management systems in accordance with ISO 14001-2004, OHSAS 18001-2007, and Responsible Recycling (R2:2013) Practice. All persons who handle mercury thermostats as part of the TRC operation receive training in the handling of Hazardous Waste and Universal Waste.

The mercury containing ampules are retorted at Veolia's Port Washington Mineral Springs facility. The mercury is removed during the retort process. The post retort debris consists of broken glass ampules. The debris is tested for residual mercury to document the removal of the mercury to levels below the US EPA Land Disposal Restriction (LDR) levels. The debris is then disposal of as a non-hazardous solid waste at Advanced Disposal Glacier Ridge Landfill, LLC in Horicon, Wisconsin.