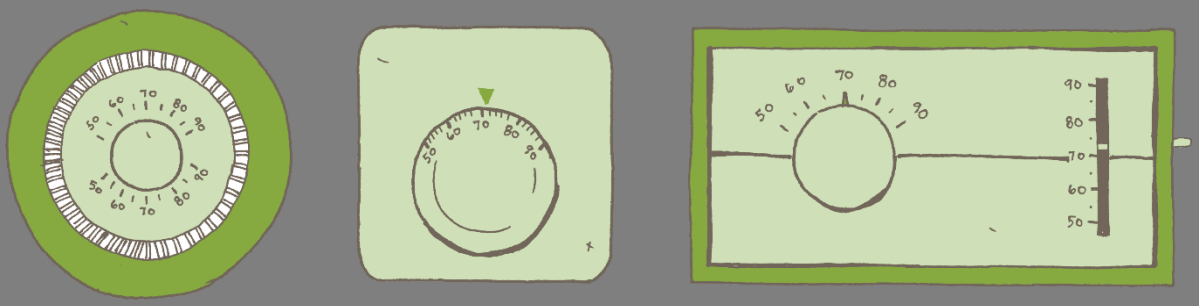
2019 ANNUAL REPORT

PENNSYLVANIA



Thermostat Recycling® CORPORATION

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THERMOSTAT RECYCLING CORPORATION GOVERNANCE (AT CLOSE OF 2019)

Thermostat Recycling Corporation Board Members

Dan O'Donnell (Chairman)
Honeywell Home

John Sartain (Vice-Chairman)
Emerson Technologies (White Rodgers)

Rob Munin (Treasurer)
Johnson Controls

Loretta Damron (Secretary)
STLPC Corporation (representing the liability of Lux Products Corporation)

Thermostat Recycling Corporation Dues Paying Members

Bard Manufacturing	Burnham Holdings	Carrier Corporation
ecobee Inc.	Empire Comfort Systems	General Electric
ITT	Lennox International Inc.	Nest Labs
Nortek Global HVAC, LLC	Rheem Manufacturing	Johnson Controls Inc.
TPI Corporation	Trane Residential Systems	White-Rodgers (Emerson)
Valliant	W.W. Grainger	Chromalox
Climate Master, Inc.	Crane Company	Goodman Global
Honeywell Home	Hunter Fan Company	STLPC Corporation (representing the liability of Lux Products Corporation)
Marley-Wylain Company	McQuay International	Schneider Electric (Invensys)
Dwyer Instruments	Taco Comfort Solutions	Uponor

Thermostat Recycling Corporation Staff

Ralph Vasami
Executive Director

Danielle Myers
Operations and Compliance Manager

WE SHARE THE GOOD NEWS – 2019 WAS ANOTHER POSITIVE YEAR

As the 2019 annual reports are being written, it is important to reflect on how much activity the program encompassed in the last year. The program continued to work in new and interesting ways to keep collecting mercury-containing thermostats. We began to streamline our vendors in the process of relocating our headquarters to New York, NY. TRC remains a nimble organization focused on finding and recycling every mercury thermostat every time.

Data shows that the replacement of HVACR equipment continues to be the leading channel for mercury thermostat replacement. The accelerated adoption of "smart-home" controls and the array of utility programs which encourage early thermostat replacements have also been major drivers of collections. Looking ahead, TRC anticipates that the program will continue to fulfill state statutory requirements, agreements and other arrangements for regulatory and legislative compliance. But we will continue to target mercury thermostat collections at utility energy efficiency programs while simultaneously maintaining the HVAC industry collections. TRC will continue to work with its partners in industry, the energy sector and the regulatory community to achieve positive results.

TRC MARKETING

The message around the importance of properly disposing of mercury-containing devices is really a familiar message, and it's hard to keep a familiar message fresh. Our goal is to maintain awareness of the issue without becoming "white" noise, which is the challenge any recycler faces. This will be accomplished through innovative marketing and creative delivery platforms.

In the energy space, TRC continues to engage the utility stakeholders on the importance of collecting mercury-containing thermostats while developing, deploying and incentivizing thermostat replacement programs. Our efforts continue to demonstrate our intent and commitment while offering suggestions related to future incentive practices.

This year we continued to utilize our Tableau software for enhanced and immediate updates on our results. More and more we are expanding the use of technology and social media to raise TRC's profile on digital platforms in a continued effort to raise awareness of the need to properly collect and dispose of mercury-containing thermostats.

KEY ALLIANCES

For a program such as TRC's to be successful year after year requires the coordinated effort of many parties. TRC is fortunate to have exceptional support from its industry members, collection partners, marketers, allied industries, regulatory agencies and staff. These strategic partnerships allow TRC's effectiveness to grow as it continues to move forward successfully in the collection and disposal of mercury-containing thermostats.

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

Ralph Vasami

Executive Director

PENNSYLVANIA

2019 Collections and Evaluation

The following analytical report details the annual program performance for mercury thermostat collection in the state of Pennsylvania in 2019. A few of the program highlights for 2019 are included below:

- In 2019 the program **collected 80.6 lbs. of mercury** in Pennsylvania. Since 2000, the annual quantity of mercury collected in Pennsylvania has averaged 76.24 lbs.
- The program collected **9,213 whole thermostats in 2019**. This was a 6% decrease over the number of thermostats collected in 2018. Since 2000, the average thermostat count per year is 8,013.
- The **number of whole thermostats collected per bin in 2019 was 48 thermostats,** an increase from 47 in 2018**.**
- The counties with the most bins and thermostats returned in 2019 were **Montgomery County (22 bins, 1,388 thermostats), Bucks County (22 bins, 936 thermostats), and Allegheny County (14 bins, 850 thermostats).**
- In 2019, **45% of the partner locations returned at least one bin**.
- **A total of 236 'Miss You' calls were placed in 2019** which identified a positive relationship between activities and bins returned.
- In addition to 9,213 whole thermostats, **421 loose switches were collected, bringing the total number of "thermostat equivalents" returned in 2019 to 9,528**, a decrease of 15% from 2018.

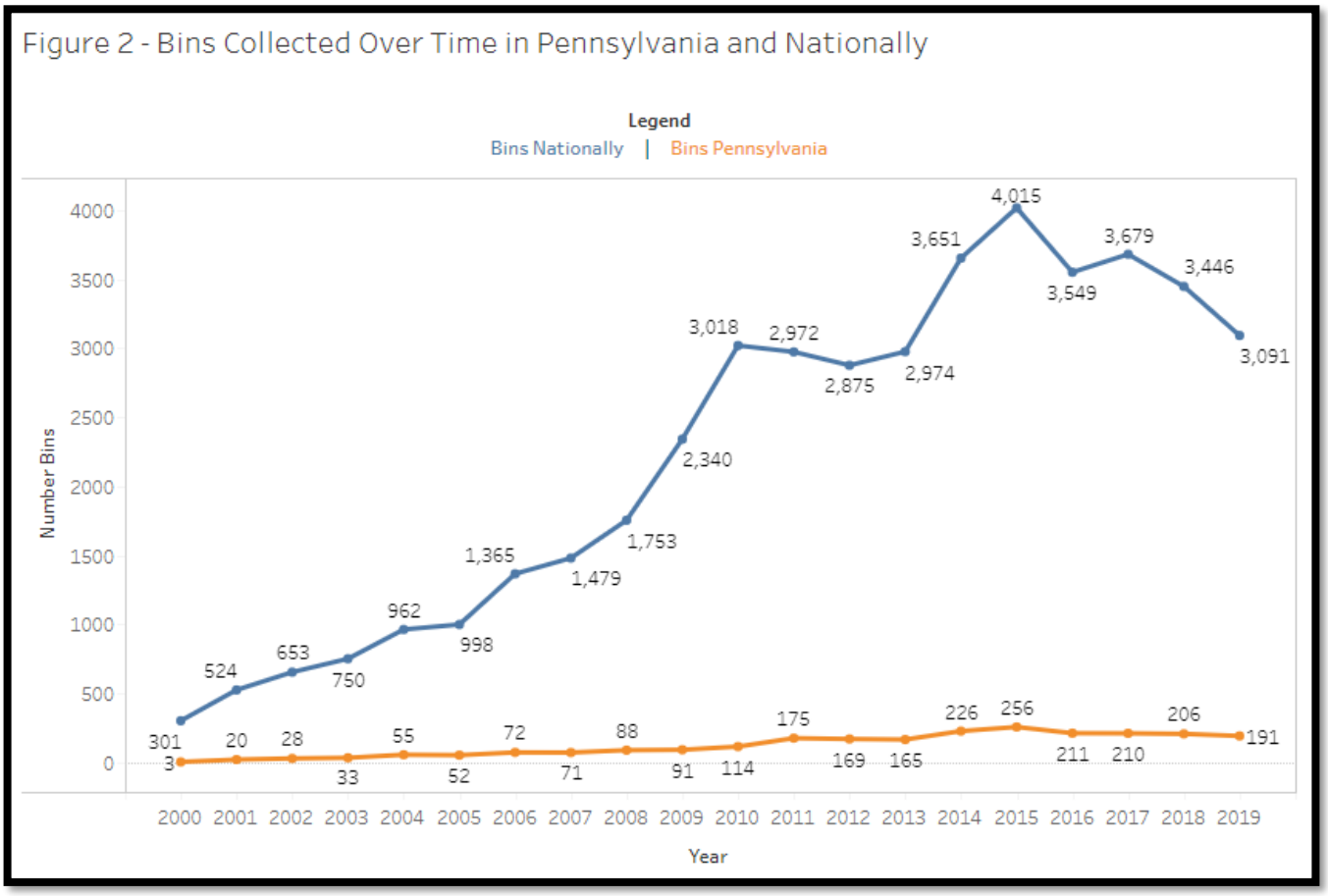
Section 1: Program Analytics

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 76.4 lbs. of mercury and 8,013 whole thermostats per year since 2000. In 2019, the program collected 80.6 lbs. of mercury from 9,213 thermostats and 421 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)
2000	3	278	2.5
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
Total	2,436	160,252	1,527.6
Average	122	8,013	76.4

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 2019, the number of bins returned was 191 bins.



The 80.6 lbs. of mercury collected in Pennsylvania in 2019 was 13% lower than the 92.5 lbs. collected in 2018. 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
2000	2.5	156%	
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%
Average	76.4		

Pennsylvania collected 9,213 thermostats in 2019. This was a 6% decrease over the number of thermostats collected in 2018. 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.

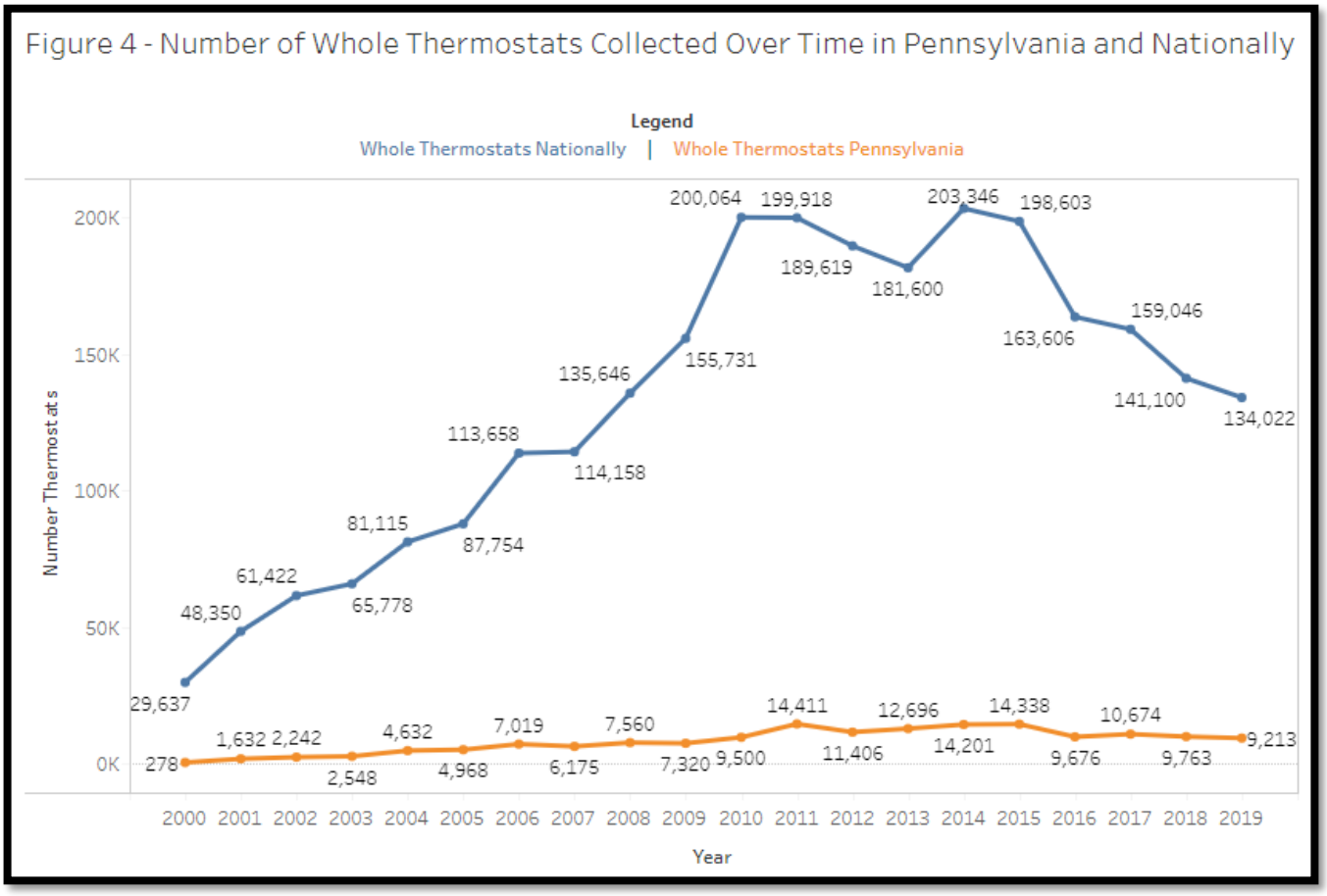
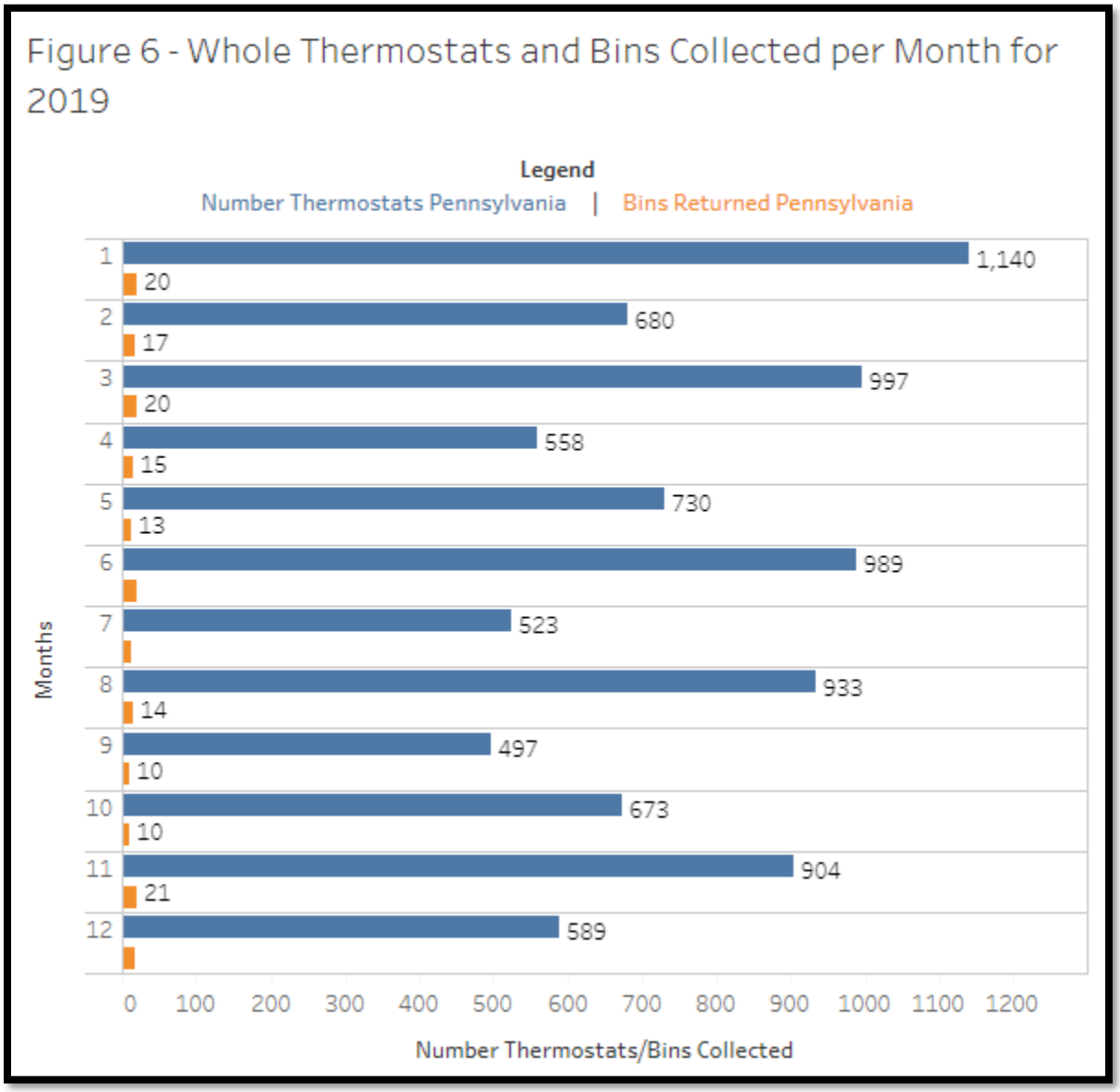


Figure 5 - Whole Thermostats Collected in Pennsylvania and Nationally Over Time and Annual Percent Change

Year	Number Thermostats	% Change Pennsylvania	% Change Nationally
2000	278	85%	
2001	1,632	487%	63%
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%

Average	8,013

Figure 6 displays the monthly distribution of bins and thermostats collected in Pennsylvania in 2019. The months with the greatest number of thermostats returned were January (1,140 thermostats, 20 bins) and March (997 thermostats, 20 bins). The month with the greatest number of bins returned was November (21 bins). Conversely, the month with the least activity in 2019 was September.



The highest number of thermostats per bin returned occurred in August and October (66.6 and 67.3 thermostats per bin each month, respectively). 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 2019

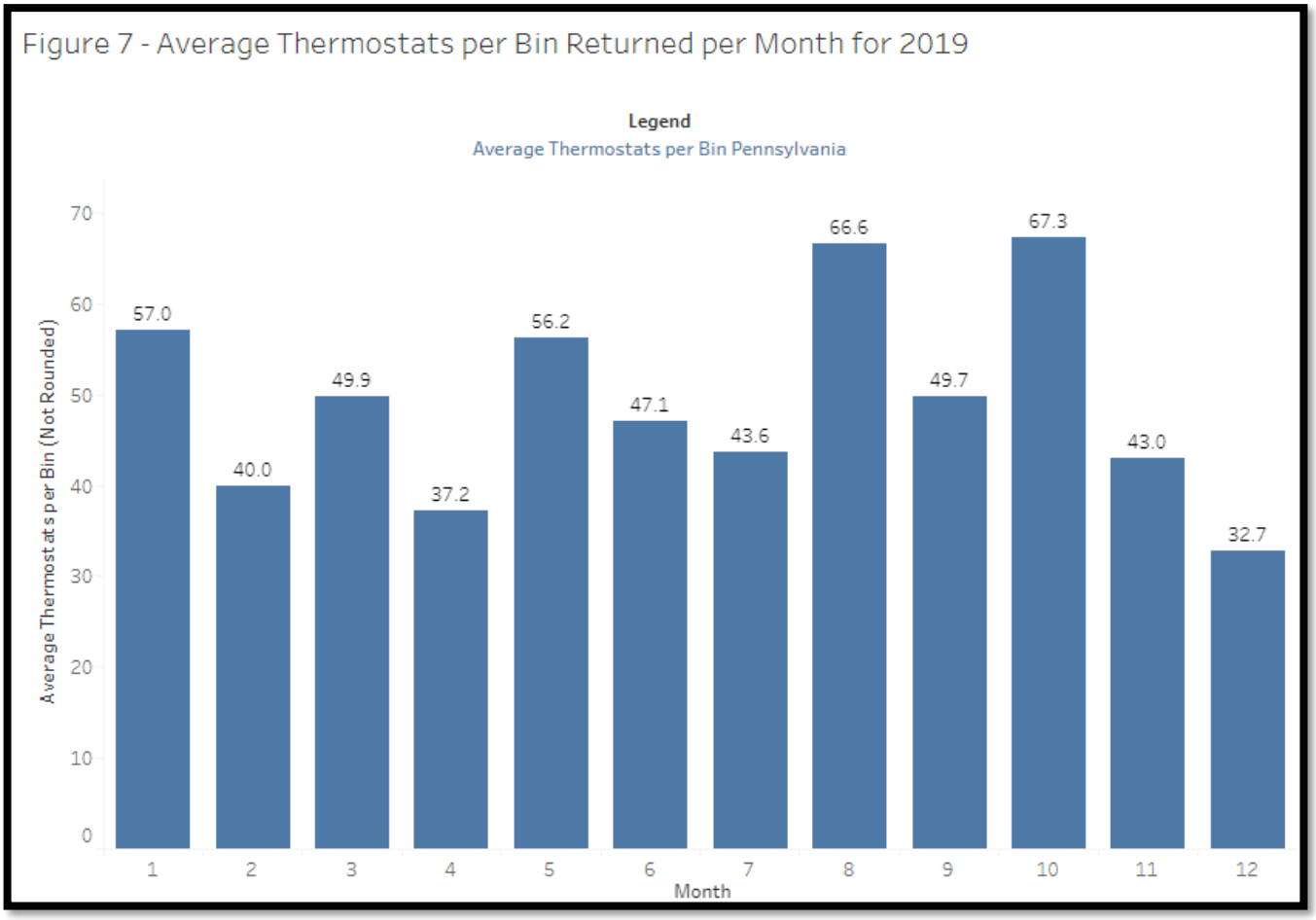


Figure 8 displays the average number of thermostats returned per bin in Pennsylvania and in the U.S. since the beginning of the Pennsylvania program. Nationally, the number of thermostats per bin has been decreasing annually since 2000. In Pennsylvania a similar pattern is observed, with the exception of a few years. The number of thermostats per bin in 2019 (48 thermostats per bin avg.) increased from 2018 (47 thermostats per bin avg.) which is the lowest to date.

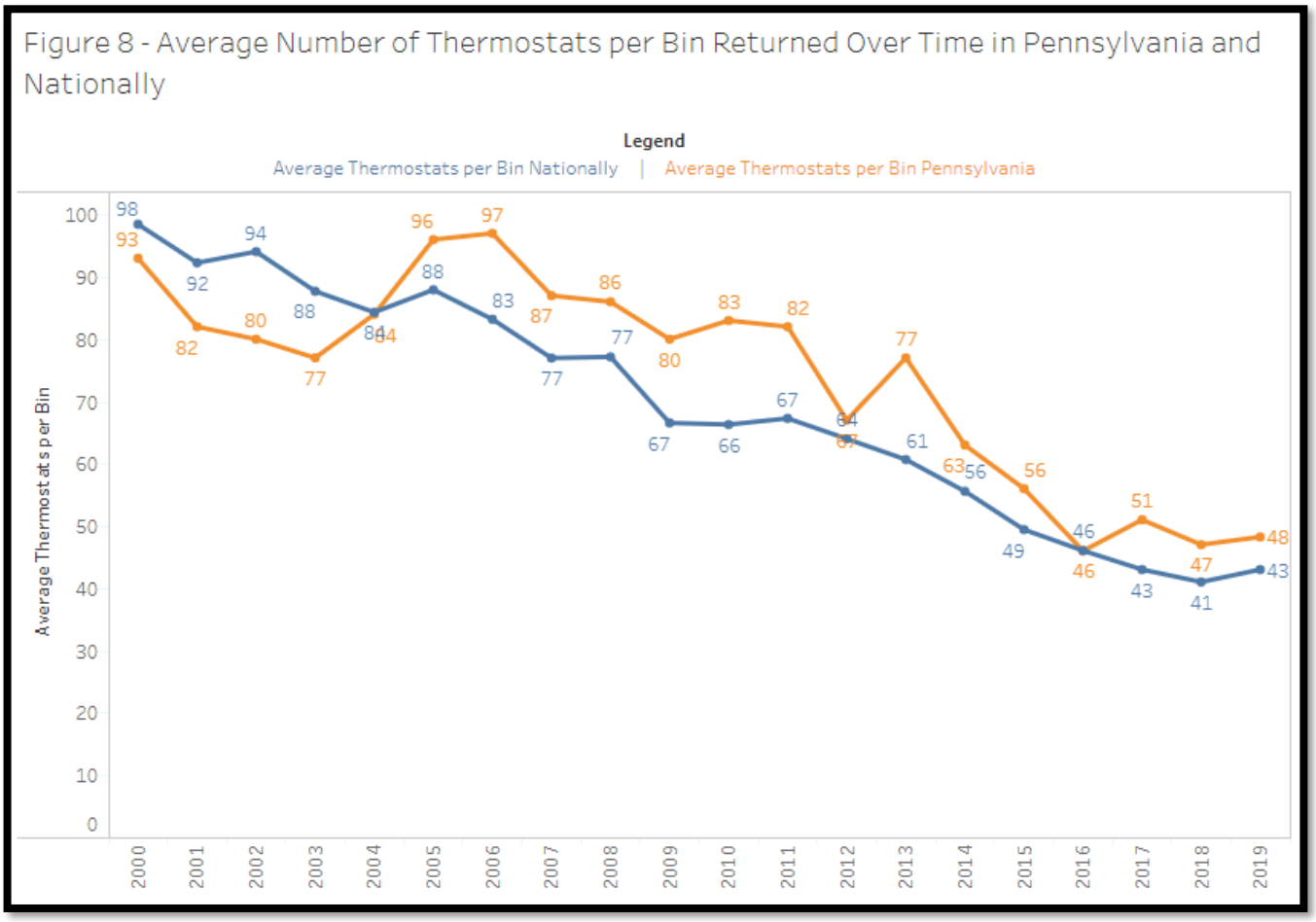
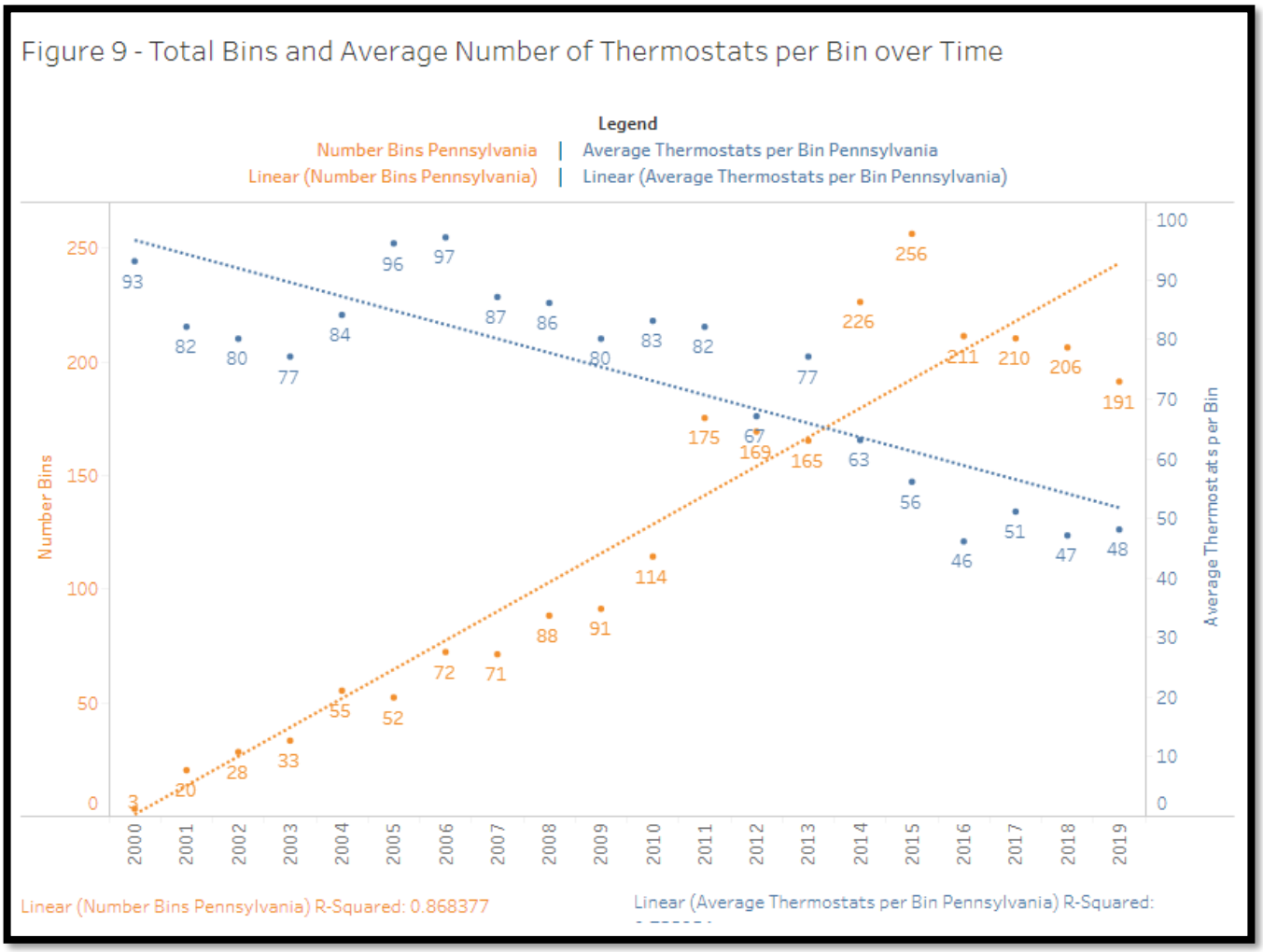
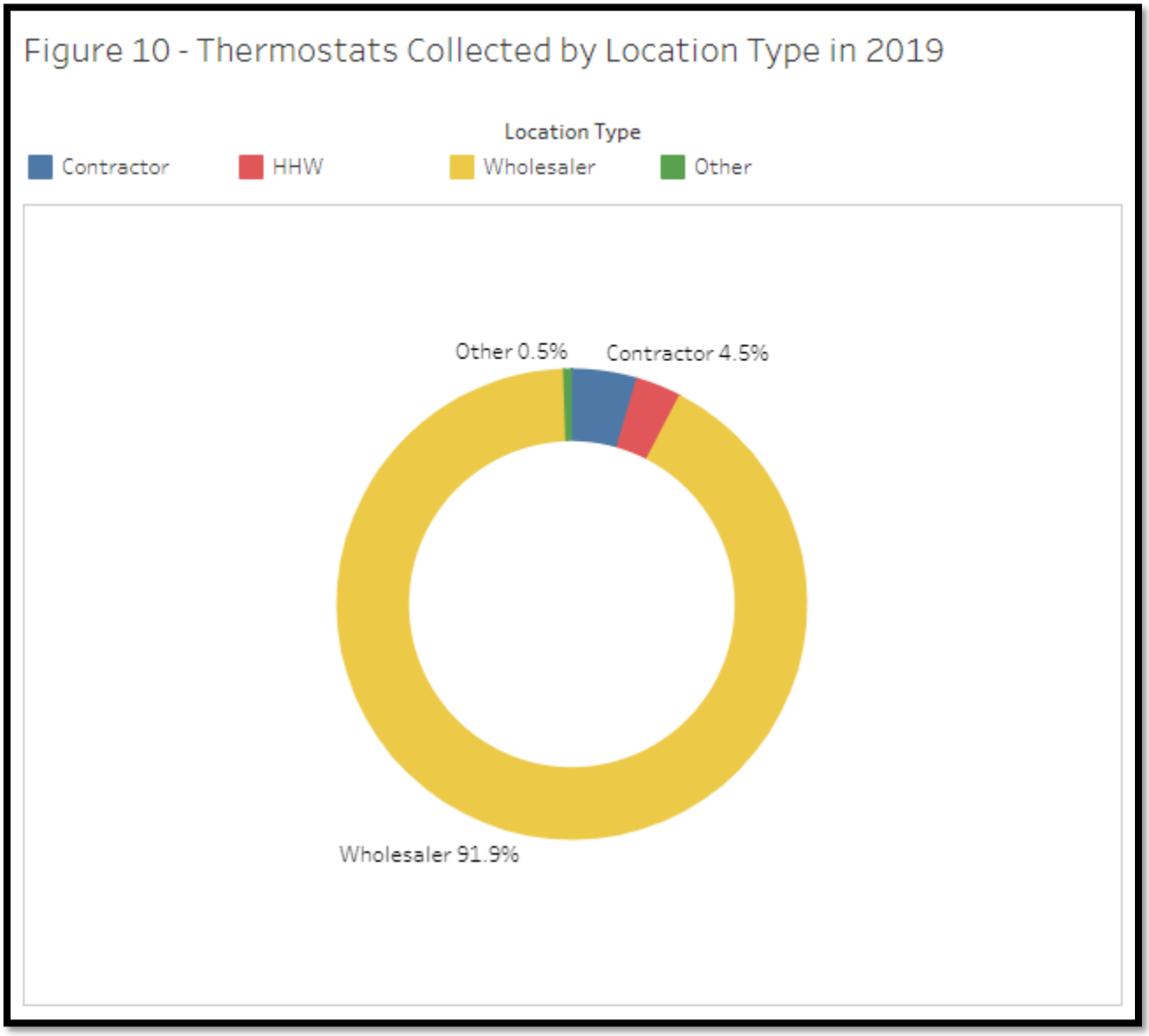


Figure 9 plots the total bins returned over time along with the average number of thermostats per bin over the same period. In general, the number of bins returned in Pennsylvania increased steadily from 2000 to 2015. At the same time, thermostats per bin generally grew until 2006, after which the trend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

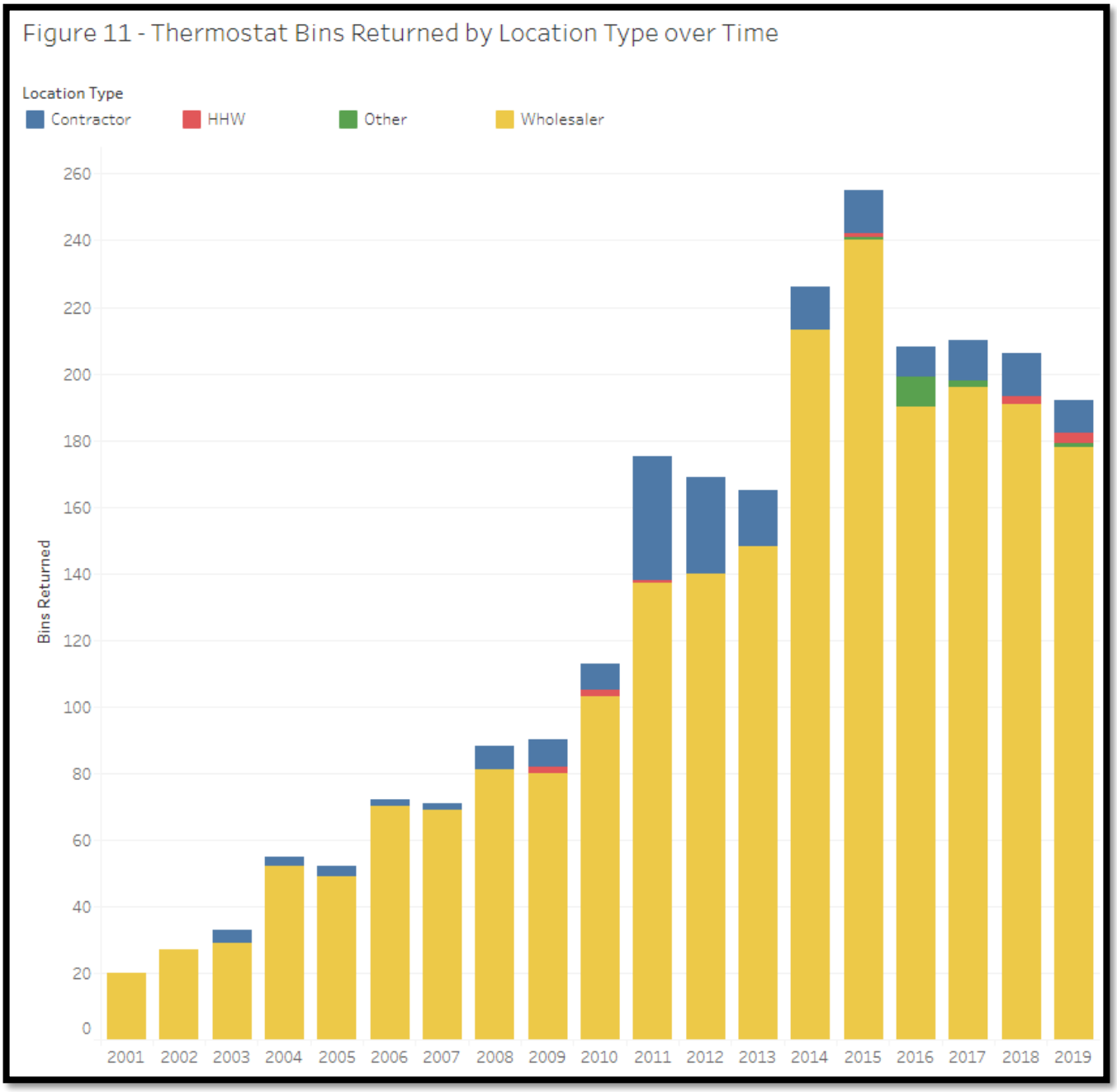


SECTION 2: Channel Partner Analysis

Section 2 of the report examines the partner locations in more detail. Most thermostats collected in Pennsylvania were through wholesalers (91.9%) with the remaining thermostats collected by contractors and HHWs. Figure 10 shows the distribution of thermostats collected by location type in 2019.



The number of bins returned in 2019 increased from 2018 across HHWs. Wholesalers and contractors decreased from 2018 levels. Figure 11 displays the change in the number of bins returned by thermostat collection type over time in Pennsylvania.



In 2019, 45% of Pennsylvania locations possessing a collection bin sent back at least one bin for recycling. The distribution is displayed in Figure 12.

Figure 12 - Percentage of Locations Returning a Bin in 2019

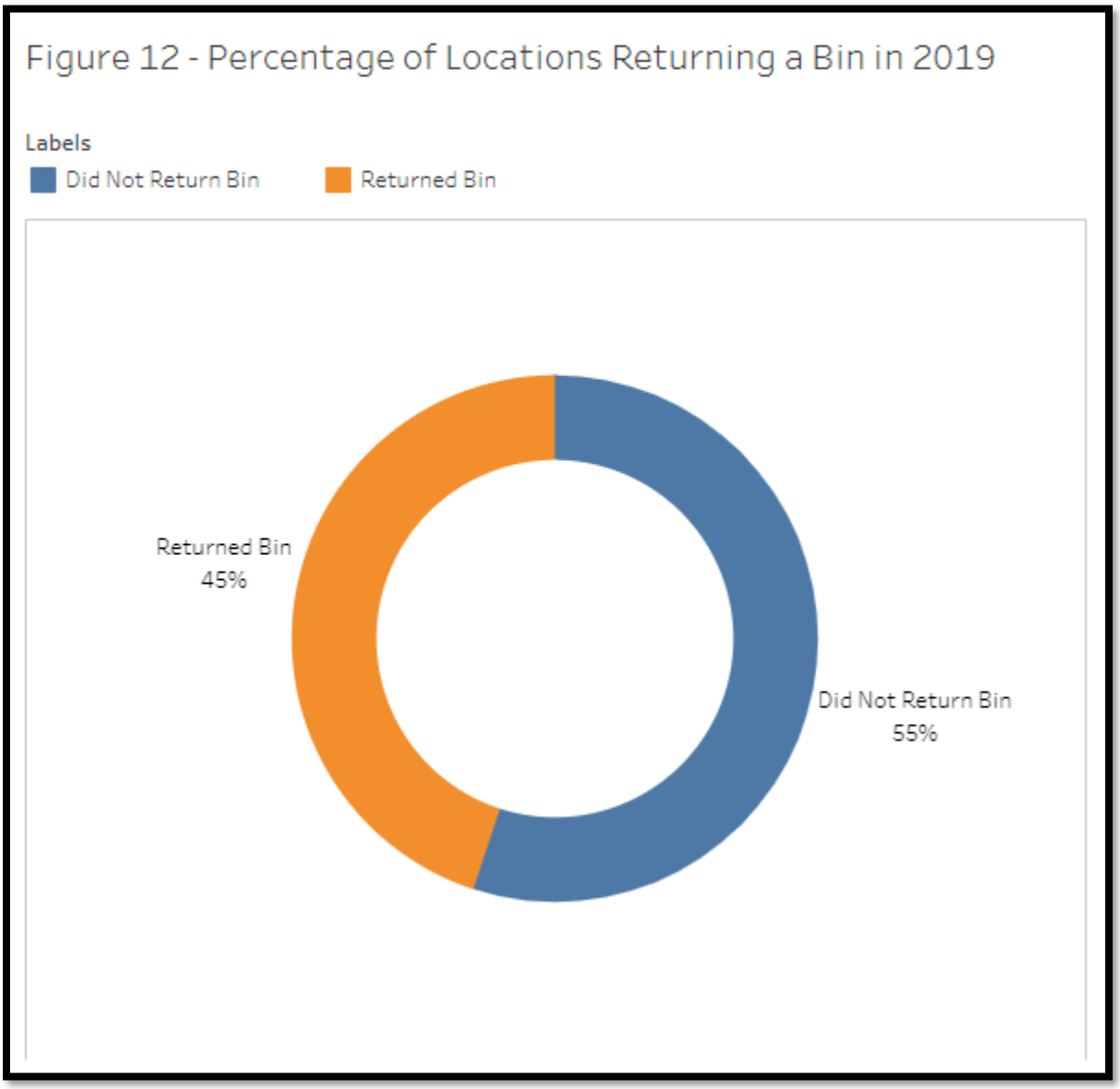


Figure 13 displays the total bins and thermostats returned by county in 2019. An analysis of the top performing counties revealed that Montgomery County (22 bins, 1,388 thermostats), Bucks County (22 bins, 936 thermostats), and Allegheny County (14 bins, 850 thermostats) returned the greatest number of bins and thermostats in 2019.

Figure 13 - Bins Returned and Total Thermostats Returned 2019 by County

	Number Thermostats	Number Bins
Montgomery	1,388	22
Bucks	936	22
Allegheny	850	14
Lancaster	765	10
Berks	659	8
Lehigh	593	11
Delaware	380	8
Dauphin	342	8
Chester	243	8
Northampton	224	3
York	223	5
Cumberland	211	6
Erie	208	5
Butler	198	4
Mercer	194	2
Fayette	176	2
Luzerne	173	8
Centre	144	5
Philadelphia	142	5
Washington	119	3
Cambria	106	1
Union	93	2
Lebanon	92	2
Franklin	90	2
Westmoreland	81	3
Mifflin	71	2
Lackawanna	65	3
Adams	55	2
Blair	42	3
Bedford	39	1
Columbia	31	1
Somerset	22	1
Monroe	19	2
Indiana	17	1
Northumberland	17	1
Lycoming	6	2

TRC partner R. E. Michel (2,927 thermostats) returned the highest number of thermostats in Pennsylvania in 2019, followed by Johnstone Supply (1,533 thermostats) and APR Supply (545 thermostats). Apart from these locations, 5 program partners returned more than 250 thermostats each. Figure 14 displays the top performers in terms of total thermostats returned in 2019.

Figure 14 - Top 10 Performing TRC Partners in Pennsylvania

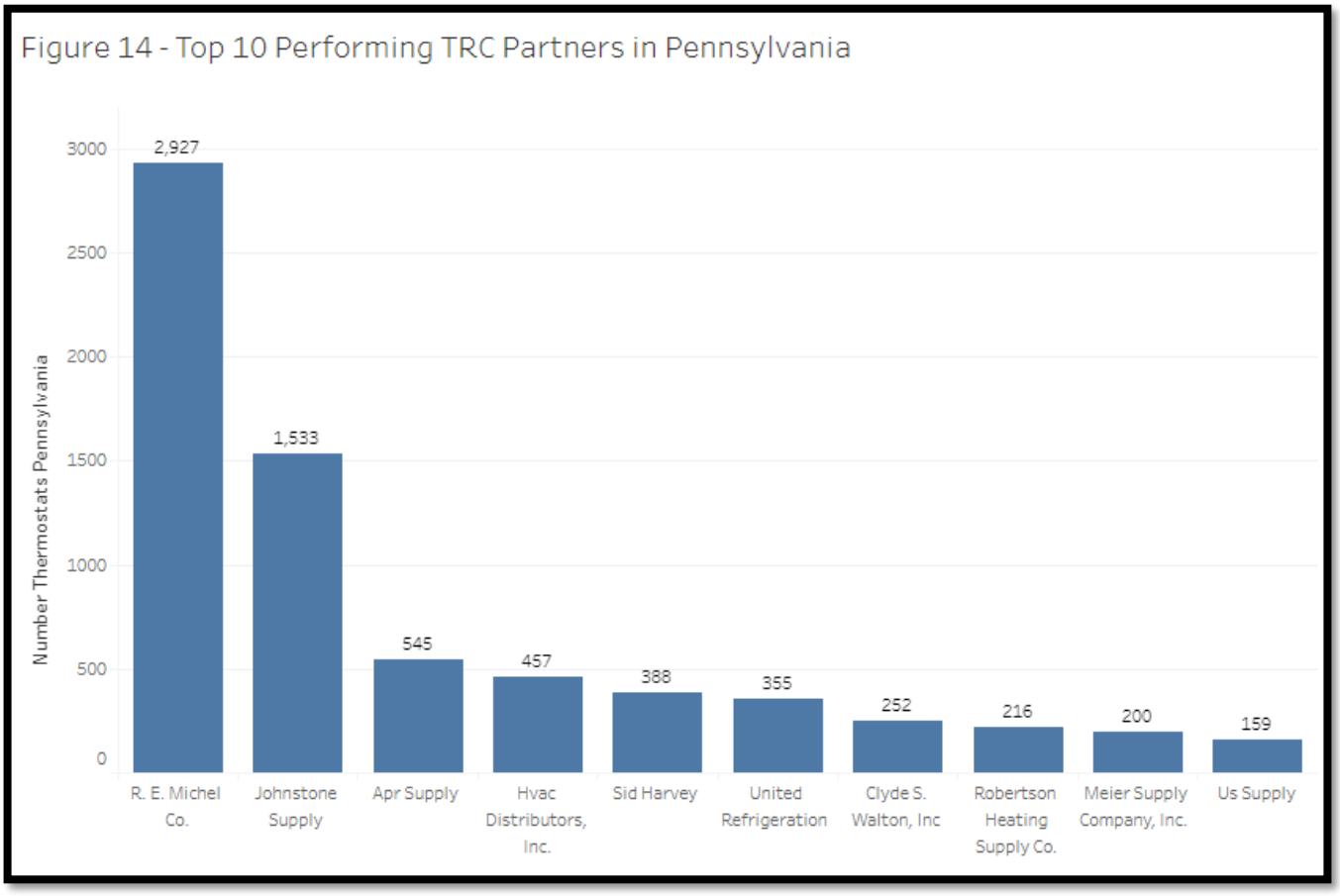


Figure 15 includes the top performers for 2019 by each of the following categories: total bins returned, total thermostats returned, and average number of thermostats per bin.

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.	2,927	42	70
Johnstone Supply	1,533	20	77
Apr Supply	545	11	50
Hvac Distributors, Inc.	457	10	46
Sid Harvey	388	7	55
United Refrigeration	355	15	24
Clyde S. Walton, Inc	252	2	126
Robertson Heating Supply Co.	216	5	43
Meier Supply Company, Inc.	200	7	29
Us Supply	159	5	32

TRC conducted several activities in 2019 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 2019, a total of 236 'miss you' calls were placed. 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 2019

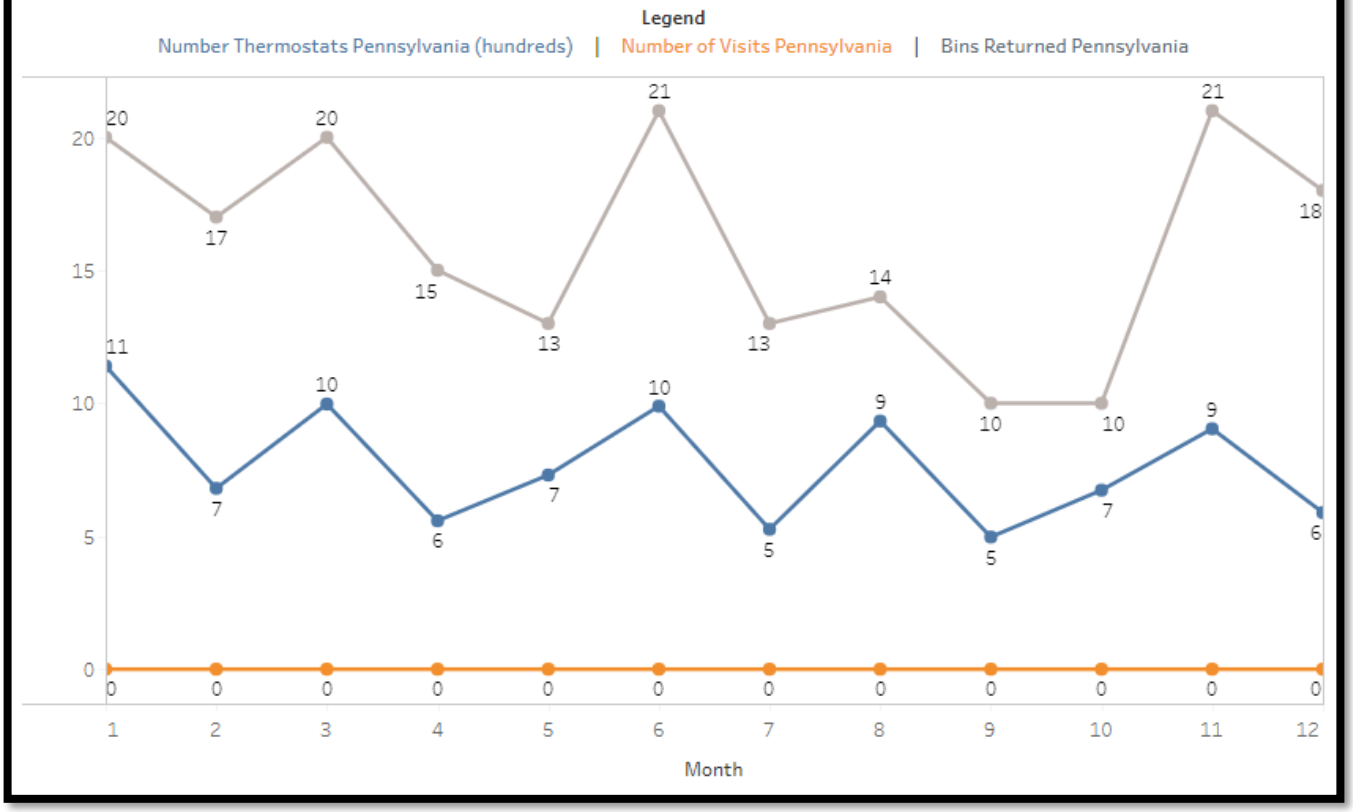


Figure 17 displays the relationship between the number of calls per month, the bins returned per month and the number of thermostats (by 100's) returned per month. Calls were placed in the months of January, May, and September.

Figure 17 - Relationship Between 'Miss You' Calls and Bins and Thermostats Returned per Month in 2019

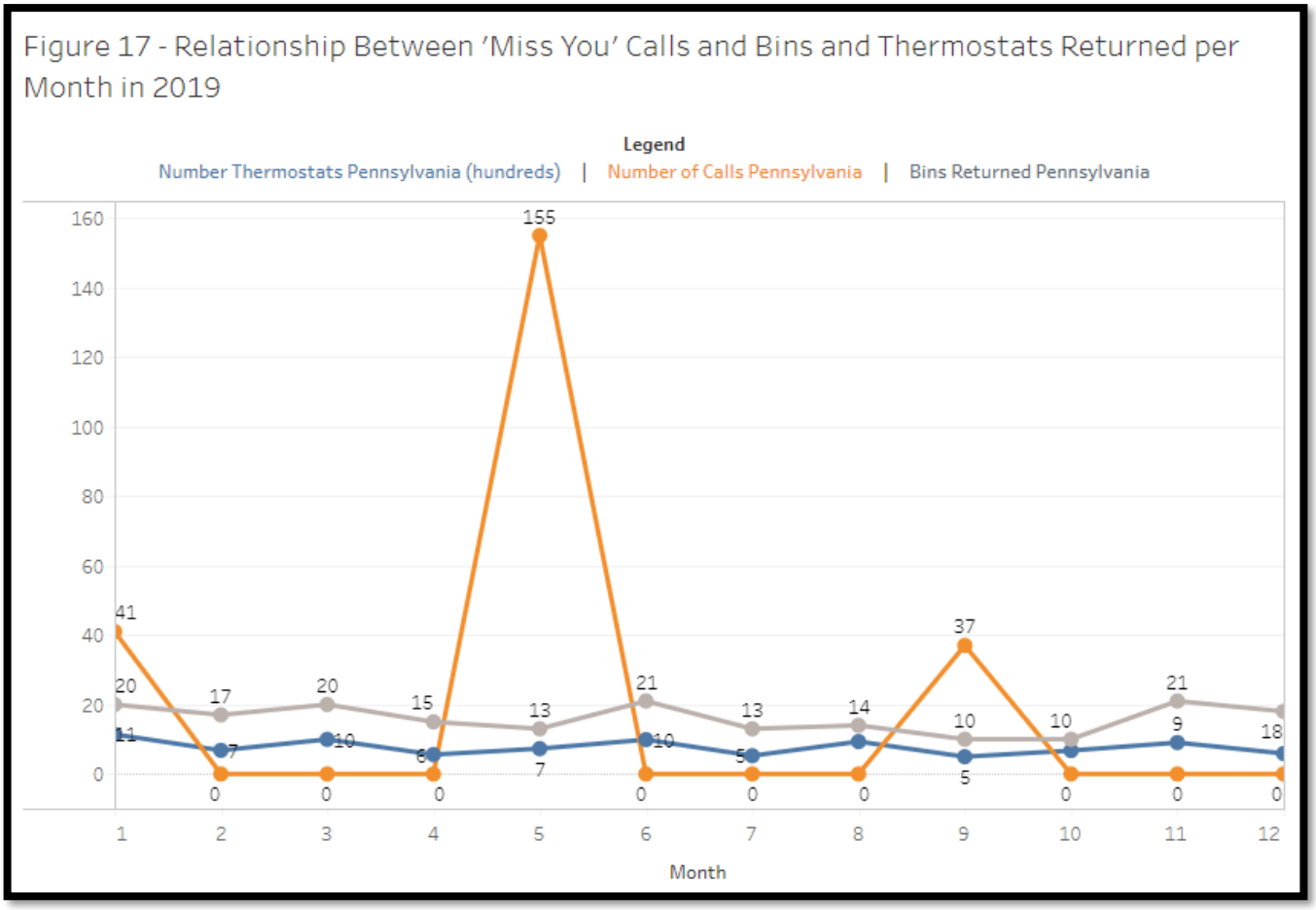


Figure 18 examines the return rates of four groups (if applicable) – locations that did not receive a call or visit, locations that received at least one visit, locations that received at least one call, and locations that received both a call and visit. The rate of active participation (which refers to locations that returned at least one bin) in 2019 was 46% for locations that did not receive either a visit or call and only 43% for called locations.

Figure 18 - Percent Change in Bins and Thermostat Returns for Locations that Received a Visit or Call Over Locations that did not Receive Either

	No Visit No Call	Visit	Call	Visit and Call
Number of Locations	198		125	
Rate of Active Participation*	46%		43%	
Bins per Participating Location	1.52		0.72	
Thermostats per Participating Location	79		26	
Thermostats per Bin	51.75		35.72	

* Locations that returned one or more bins during 2019.

SECTION 3: Comparisons to National and Other States' Data

To compare how the Pennsylvania collection partners performed in 2019, 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 19.

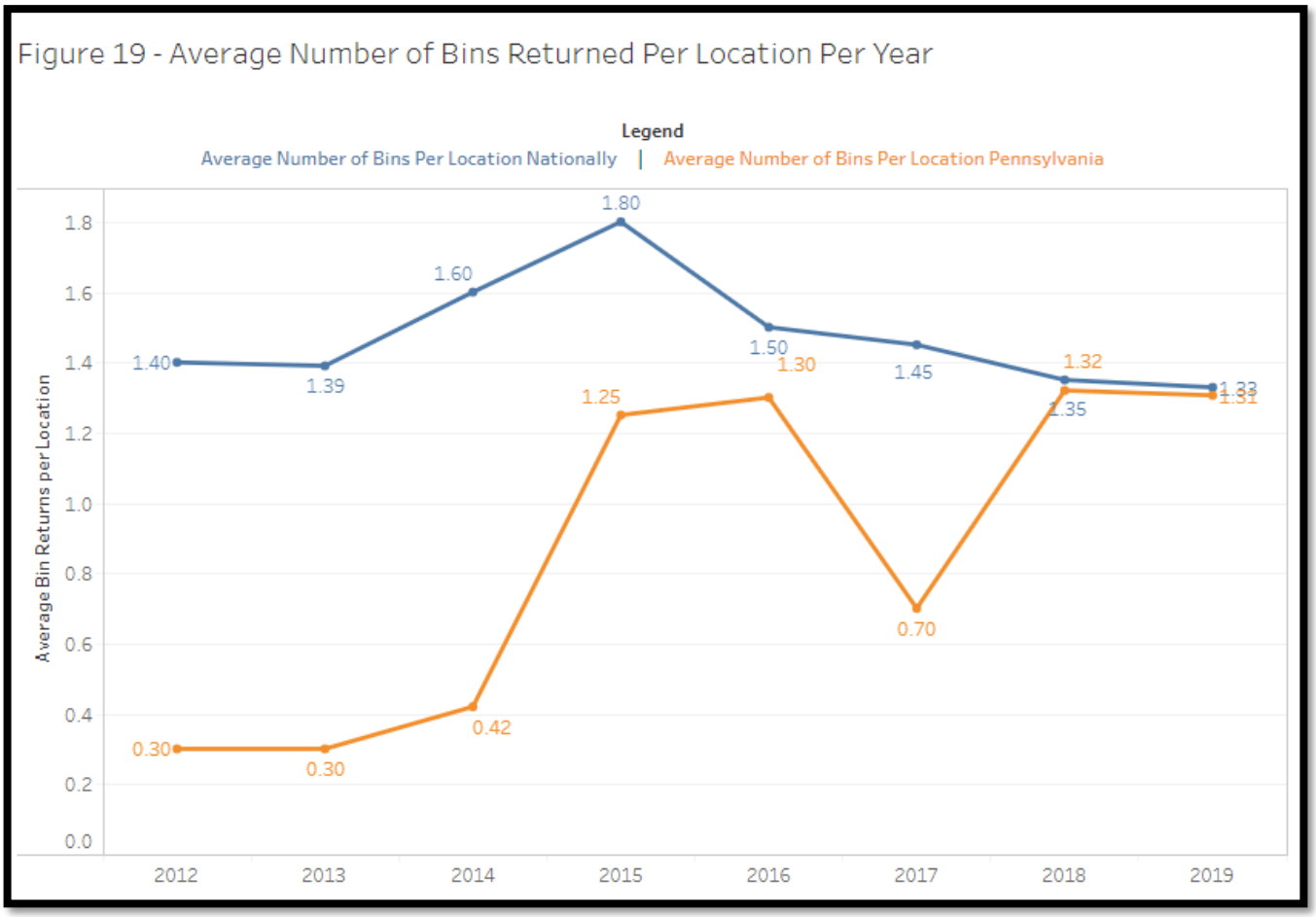


Figure 20 displays the locations in Pennsylvania that returned more than one bin in a given year since 2016, and Figure 21 displays the top 10 partners in the U.S. over the same period in terms of the number of bins returned.

Figure 20 - Partner Locations in Pennsylvania Returning More than 1 Bin per Last 4 Years

2016	
R.e. Michel	37
APR Supply Company	23
United Refrigeration	17
Johnstone Supply	14
Sid Harvey Industries	9
York UPG	8
Peirce-Phelps Inc	7
Binghamton Hardware & HVAC	5
HVAC Distributors Inc	5
Meier Supply Company Inc.	5
Robertson Heating Supply Co	4

2017	
R.e. Michel	46
Johnstone Supply	26
United Refrigeration	18
Apr Supply Company	16
Sid Harvey Industries	9
Ferguson Enterprises	8
Peirce-Phelps Inc	8
UPG Stores	7
US Supply	7
Meier Supply Company Inc.	6
HVAC Distributors Inc	5

2018	
R.E. Michel Co.	38
Apr Supply	20
United Refrigeration	17
Johnstone Supply	15
Johnson Controls	13
Sid Harvey	12
Peirce-Phelp, Inc	10
Ferguson	9
Lennox	9
Hvac Distributors, Inc.	6
Meier Supply Company, Inc.	4
Robertson Heating Supply Co.	4
Thos. Somerville Co.	4
Epsco	3
Goodman Distribution	3
Trane	3
Binghamton Hardware & Hvac	2
Burkholder's Hvac	2
Hannabery Hvac	2
Us Supply	2

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
Sid Harvey	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

Figure 21 - Top 10 Performing Partner Locations Nationwide in Bins Returned Last 4 Years

2016

Johnstone Supply	444
R.E. Michel	292
United Refrigeration	237
Lennox Industries Inc.	131
Ferguson Enterprises	104
US Air Conditioning Distri..	70
Ace Supply Co Inc	66
Goodman Distribution Inc.	66
Lux Products	54
F.W. Webb	47

2017

Johnstone Supply	515
R.E. Michel	285
United Refrigeration	192
Ferguson Enterprises	144
Lennox Industries Inc.	89
US Air Conditioning Distri..	73
Refrigeration Supplies Di..	71
F.W. Webb	64
Goodman Distribution Inc.	60
Sid Harvey Industries	52

2018

Johnstone Supply	364
R.E. Michel Co.	258
United Refrigeration	213
Lennox	129
Ferguson	108
Wheelabrator	74
Us Air Conditioning Distri..	69
Watsco	60
Goodman Distribution	55
Sid Harvey	50

2019

Johnstone Supply	376
R. E. Michel Co.	229
United Refrigeration	155
Ferguson	106
Lennox	89
Us Air Conditioning Distributors (USACD)	68
Watsco	51
Goodman Distribution	64
Wheelabrator	62
Refrigeration Supplies Distributor (RSD)	53

Figure 22 displays total percentage of locations that actively participated in the program (active participation defined as sending back at least one bin) in 2019, 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 2019, 45% of the locations in PA returned at least one bin compared to a national average of 17%. The highest percentage of locations returning a bin in 2019 amongst states that mandate thermostat returns reporting was Rhode Island (74%).

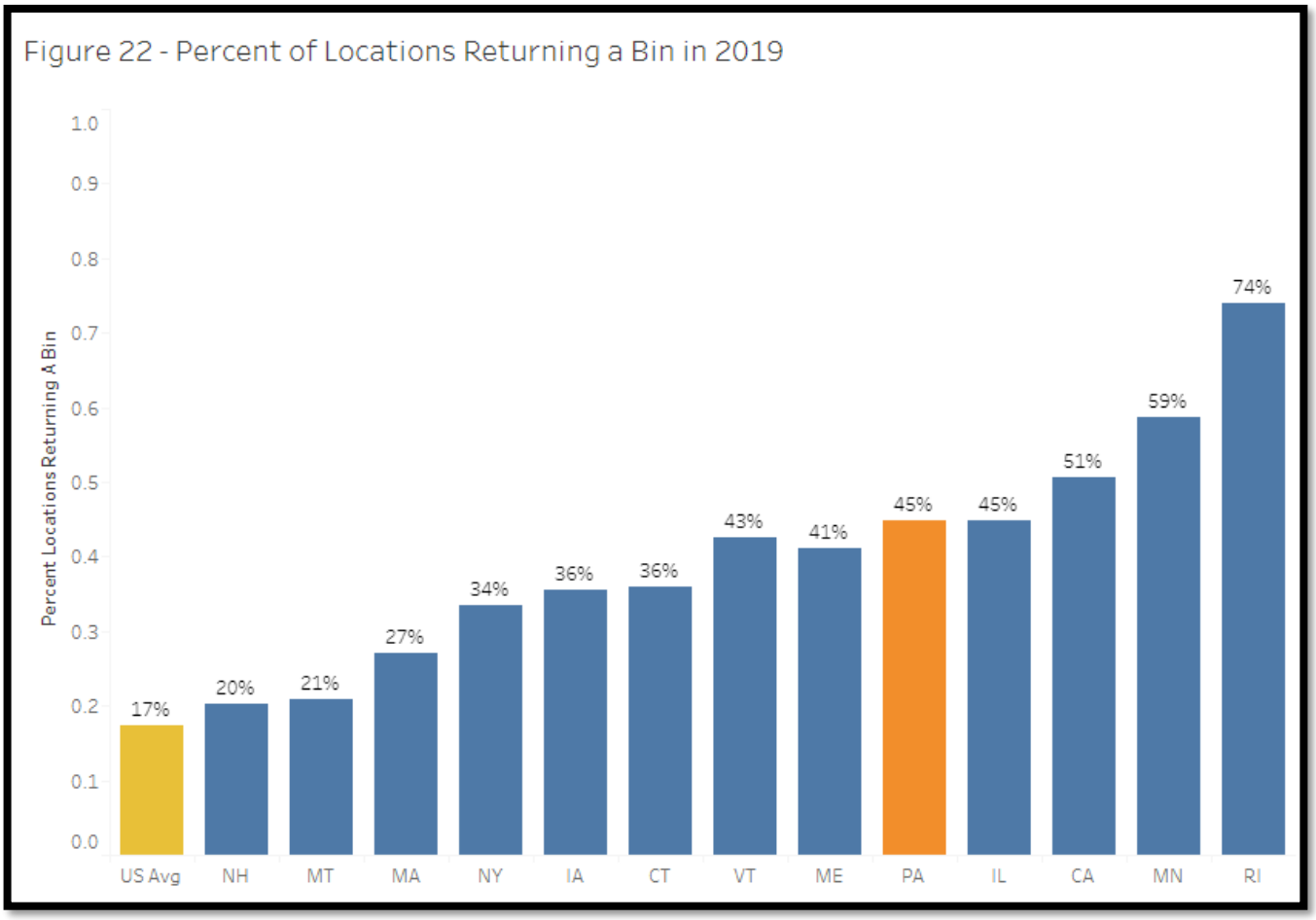


Figure 23 compares the Pennsylvania and national rates for several analytics. These include: total whole thermostats, bins, and loose switches collected, number of thermostats collected by total locations and per actively participating locations, number of thermostats per bin returned on average, equivalent average, number of mercury thermostat equivalents returned in 2019, and finally percent change in mercury thermostat conversion from 2018 to 2019. 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 23 - Comparison of States and US Average Among Several Categories

State	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 2019	Equivalent Average	Thermostat Equivalents in 2019	% Change over previous year
CA	14,305	577	3,563	19	25	34	1.7424	16,350	4%
CT	1,694	54	1,208	8	31	22	1.3118	2,615	-30%
IA	2,109	50	3,556	18	42	47	1.2567	4,939	129%
IL	7,756	234	827	17	33	36	1.2521	8,416	-5%
MA	13,114	176	1,247	40	75	143	1.2028	14,151	-3%
ME	4,397	108	3	22	41	51	1.0936	4,400	46%
MN	6,891	96	703	52	72	88	1.2093	7,472	-12%
MT	268	10	0	11	27	54	0.9751	268	-30%
NH	1,864	57	675	9	33	45	1.1571	2,447	26%
NY	4,963	160	74	10	31	29	1.2482	5,022	-26%
PA	9,213	191	421	27	48	59	1.3355	9,528	-15%
RI	4,017	54	491	87	74	115	1.0868	4,469	1%
VT	2,171	88	5	13	25	28	1.0615	2,176	-8%
US Avg	2,792	64	788	14	43	59	1.4153	3,334	-31%

Figure 24 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 24 - 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 2019	Equivalent Average	Thermostat Equivalents in 2019	% Change over previous year
1	CA	CA	CA	RI	MA	MA	CA	CA	IA
2	MA	IL	IA	MN	RI	RI	US Avg	MA	ME
3	PA	PA	MA	MA	MN	MN	PA	PA	NH
4	IL	MA	CT	PA	PA	PA	CT	IL	CA
5	MN	NY	IL	ME	US Avg	US Avg	IA	MN	RI
6	NY	ME	US Avg	CA	IA	MT	IL	NY	MA
7	ME	MN	MN	IA	ME	ME	NY	IA	IL
8	RI	VT	NH	IL	IL	IA	MN	RI	VT
9	US Avg	US Avg	RI	US Avg	NH	NH	MA	ME	MN
10	VT	NH	PA	VT	CT	IL	NH	US Avg	PA
11	IA	CT	NY	MT	NY	CA	ME	CT	NY
12	NH	RI	VT	NY	MT	NY	RI	NH	CT
13	CT	IA	ME	NH	CA	VT	VT	VT	MT
14	MT	MT	MT	CT	VT	CT	MT	MT	US Avg

2019 Collections by Brand

In Pennsylvania, Thermostat Recycling Corporation (TRC) recovered the equivalent of 9,528 mercury thermostats from 9,213 whole mercury thermostats plus 421 mercury switches removed from thermostats. A total of 80.6 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 the corresponding thermostats, count of switches and pounds of mercury recycled is below. It is important to note that there still remain non-members whose thermostats the TRC collection program recycles. They are listed in the table as "Non-Member Brands". Also, there was a change that affected TRC's membership.

1. Sears Holdings filed for bankruptcy on October 15, 2018 and is no longer a paying TRC member.

[1] A mercury thermostat contains a variable amount of mercury ampoules or "switches" attached to the subbase of the thermostat. These glass ampoules often times 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 Mercury
Bard Manufacturing Corporation	1	1	0.0062
Burnham Holdings, Inc	0	0	0
Carrier Corporation	77	180	1.116
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	831	884	5.4808
Empire Comfort Systems	0	0	0
General Electric Corporation	62	127	0.7874
Goodman Global	93	203	1.2586
Honeywell Home	7585	10006	62.0372
Hunter Fan Company	0	0	0
ITT Corporation	3	3	0.0186
Lennox International Inc.	117	238	1.4756
Marley-Wylain Company	0	0	0
Nest	0	0	0
Nortek Global HVAC	12	26	0.1612
Rheem Manufacturing Company	47	89	0.5518
Schneider Electric (Invensys Controls)	20	27	0.1674
STLPC (Representing the liability of Lux Products Corporation)	30	32	0.1984
Taco Comfort Solutions	0	0	0
TPI Corporation	0	0	0
Trane Residential Systems	256	664	4.1168
Uponor, Inc.	0	0	0
Vaillant Corporation	0	0	0
W. W. Grainger	0	0	0
York/Johnson Controls	59	80	0.496
Non-Member Brands			
Asystat	1	2	0.0124
ces	1	4	0.0248
Sears Holdings	21	21	0.1302
NOM (Manufacturer not identifiable)			
Loose Switches	0	421	2.6102
Total	**9216**	**13008**	**80.6496**

2019 Accounting of the Program Expenses

Below is a summary of program expenses for the Pennsylvania collection program in 2019. 2019 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	2018	2019	Difference
Direct Expense for Marketing & Outreach	$ 7,775.00	$ 1,290.20	$ (6,484.80)
Incentive/Promotional Payments	$ (125.00)	$ -	$ 125.00
Legal	$ -	$ -	$ -
New Collection Containers	$ -	$ -	$ -
Recycling Costs	$ 41,003.00	$ 37,129.89	$ (3,873.11)
Travel	$ 1,161.00	$ 247.03	$ (913.97)
TRC Staff & Administration	$ 8,560.00	$ 188.18	$ (8,371.82)
Total Expenses	**$ 58,374.00**	**$ 38,855.30**	**$ (19,518.70)**

2019 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://www.thermostat-recycle.org/resources/annual_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.

A site evaluation of the Veolia Processing Center in Port Washington, WI was conducted by TRC's operations and compliance manager, Danielle Myers, in late October 2019. An audit is scheduled to be completed every two years.