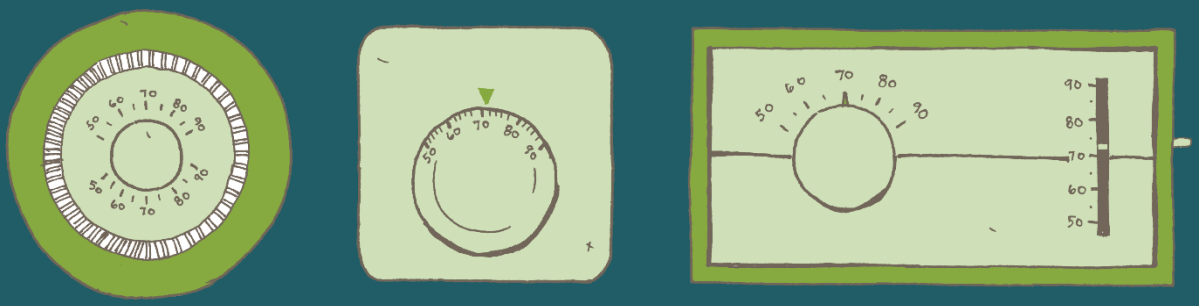
2020 ANNUAL REPORT

PENNSYLVANIA



Thermostat Recycling® CORPORATION

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THERMOSTAT RECYCLING CORPORATION GOVERNANCE (AT CLOSE OF 2020)

Thermostat Recycling Corporation Board Members

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

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

Bob Johnson (Treasurer)
Lennox Industries

Loretta Damron (Secretary)
STLPC Corporation (f/k/a 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 (f/k/a 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

LETTER FROM THE EXECUTIVE DIRECTOR

2020 has been a very difficult year for many in our country. The COVID-19 pandemic and its impact on all aspects of our personal and professional lives is hard to calculate. As we reflect on the accomplishments that were achieved in 2020, we must also understand that the pandemic's effects will continue to be felt well into 2021 as well. However, despite the difficulties experienced during this most unusual year it is important to consider how much activity TRC was able to execute in the last year. The program continued to work in new and interesting ways to keep collecting mercury-containing thermostats and recycling every mercury thermostat every time.

While overall 2020 collections are down, data shows that the replacement of HVACR equipment continues to be the leading indicator to mercury thermostat replacement. The accelerated adoption of "smart-home" controls and the array of utility programs which encourage early thermostat replacements continue to be major drivers of collections. Looking ahead, TRC anticipates that the program will experience a rebound in 2021 collections as site visits can be utilized in a greater capacity to encourage the return of mercury containing thermostats. However, it is important to remember that TRC collects and recycles a product that has not been sold in the marketplace since 2007; and as there is a decreasing number of mercury-containing thermostats in use, our collections will continue to decline.

TRC was able to fulfill state statutory requirements, agreements and other arrangements for regulatory and legislative compliance, despite the strain our country experienced in 2020. In 2021, TRC will continue to target mercury thermostat collections with utility energy efficiency programs while simultaneously maintaining the HVAC industry collections. TRC plans to work with its partners in industry, the waste sector, the energy sector and the regulatory community to achieve positive results.

The message around the importance of the proper disposal of mercury-containing devices is really a familiar message. As with any recycling program, our goal is to maintain awareness of the issue without becoming background noise lost in the constant stream of marketing information broadcast

each day. One exciting change coming to TRC in 2021 will be a redesigned website, built to better target individual recyclers and homeowners as well as expanded mobility functions.

For a program such as TRC's to be successful year after year, the coordinated effort of many parties is required. 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 proper 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

2020 Collections and Evaluation

The following analytical report details the annual program performance for mercury thermostat collection in the state of Pennsylvania in 2020. It is important to note that collections were most likely affected by the pandemic, whether it be fewer in-home replacements, a delay of dropping thermostats off for recycling or collection locations returning less recycling containers due to limited personnel. A few of the program highlights for 2020 are included below:

- In 2020 the program **collected 49.4 lbs. of mercury** in Pennsylvania. Since 2000, the annual quantity of mercury collected in Pennsylvania has averaged 76.1 lbs.
- The program collected **5,733 whole thermostats in 2020**. This was a 38% decrease over the number of thermostats collected in 2019. Since 2000, the average thermostat count per year is 7,904.
- The **number of whole thermostats collected per bin in 2020 was 49 thermostats,** an increase from 48 in 2019**.**
- The counties with the most bins and thermostats returned in 2020 were **Bucks County (13 bins, 752 thermostats), Allegheny County (9 bins, 599 thermostats), and Montgomery County (8 bins, 421 thermostats).**
- In 2020, **77% of the partner locations returned at least one bin**.
- **A total of 231 'Miss You' calls were placed and 18 site visits in 2020** which identified a positive relationship between activities and bins returned.
- In addition to 5,733 whole thermostats, **301 loose switches were collected, bringing the total number of "thermostat equivalents" returned in 2020 to 5,958**, a decrease of 37% from 2019.

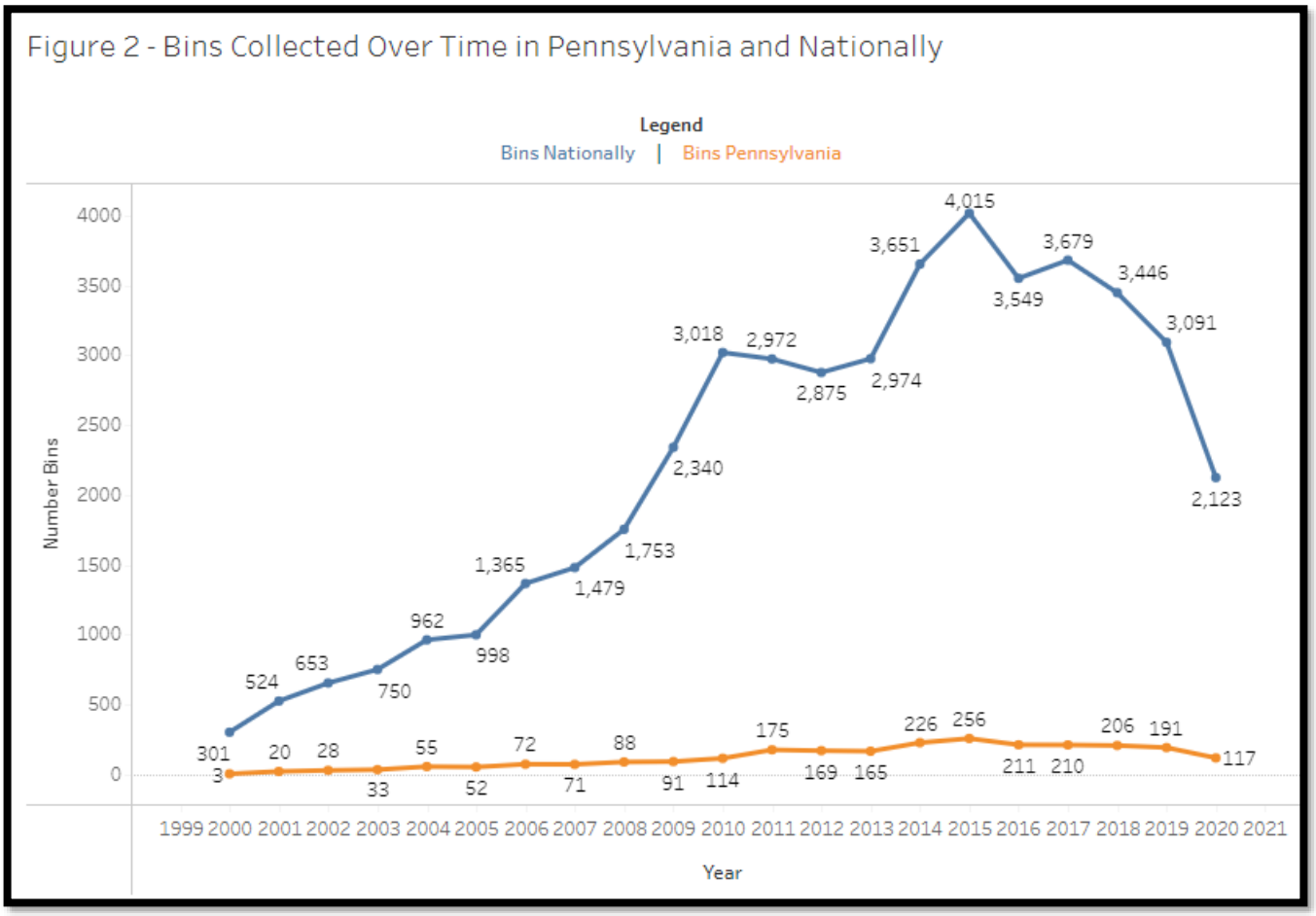
Section 1: Program Analytics

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 75.1 lbs. of mercury and 7,904 whole thermostats per year since 2000. In 2020, the program collected 49.4 lbs. of mercury from 5,733 thermostats and 301 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
2020	117	5,733	49.4
Total	2,553	165,985	1,577.0
Average	122	7,904	75.1

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 2020, the number of bins returned was 117 bins.



The 49.4 lbs. of mercury collected in Pennsylvania in 2020 was 39% lower than the 80.6 lbs. collected in 2019. 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%	-81%
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%	-71%
Average	75.1		

Pennsylvania collected 5,733 thermostats in 2020. This was a 38% decrease over the number of thermostats collected in 2019. 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.

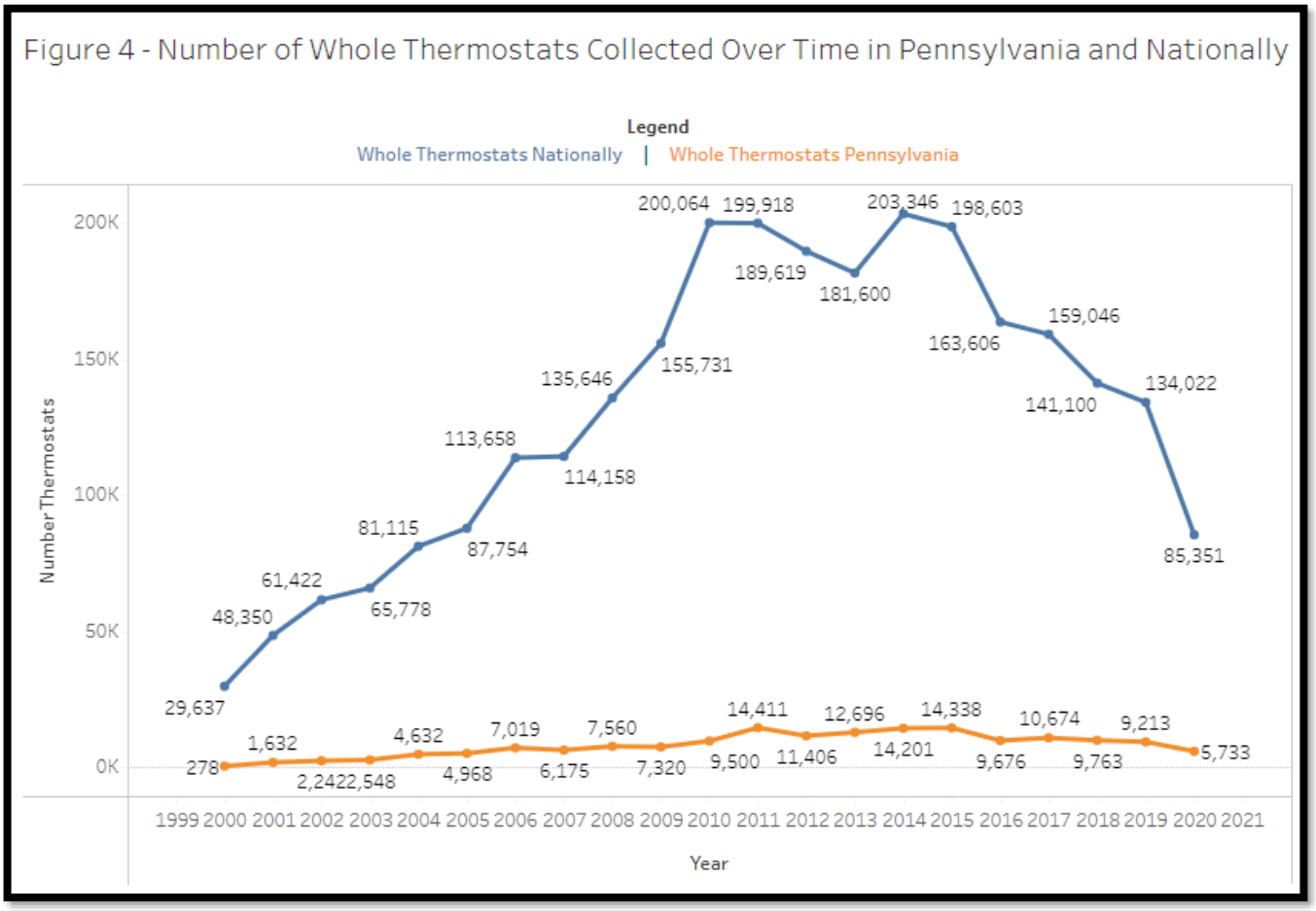
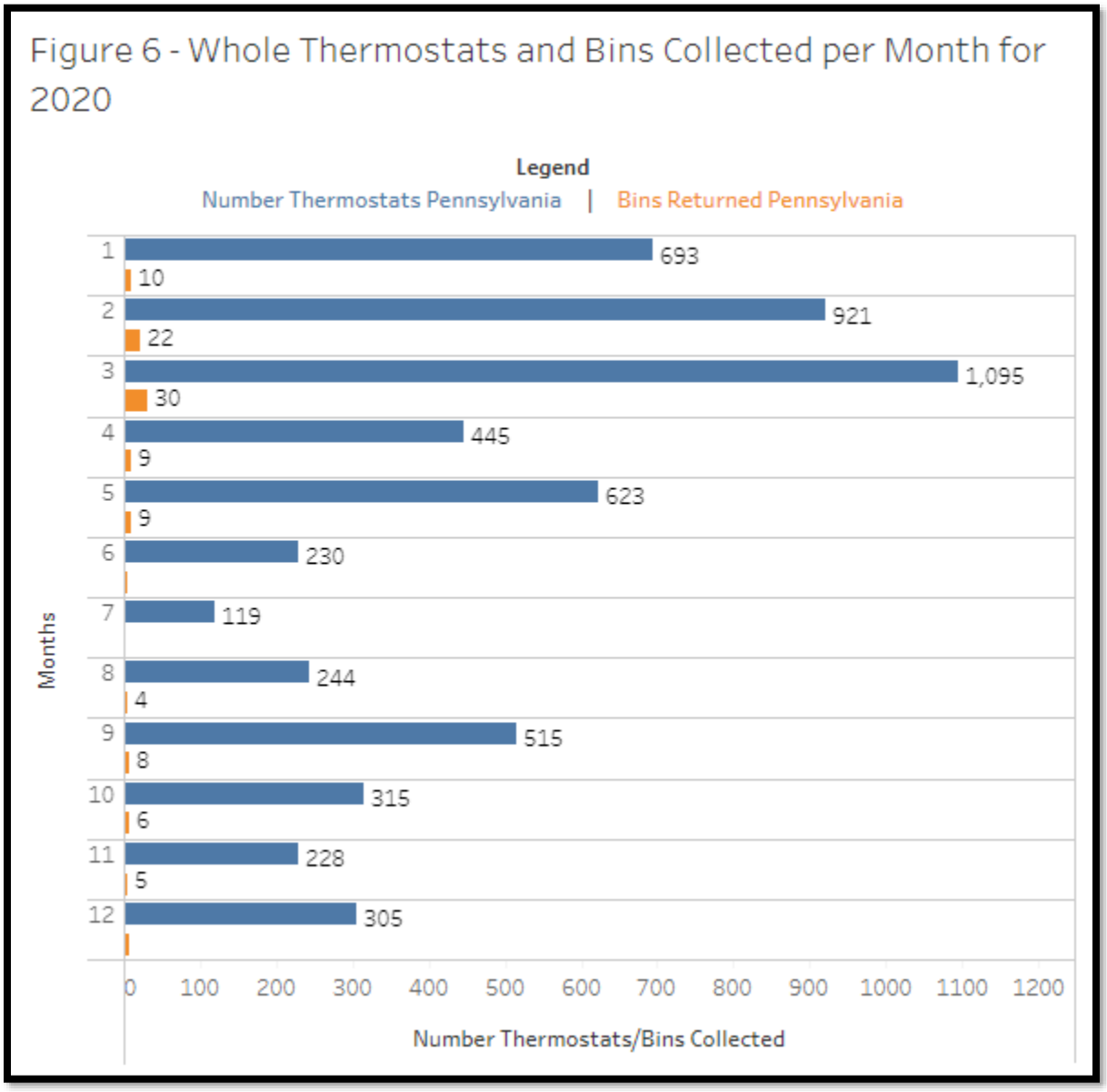


Figure 5 - Whole Thermostats Collected in Pennsylvania and Nationally Over Time and Annual Percent Change

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%
2020	5,733	-38%	-36%
Average	7,904		

Figure 6 displays the monthly distribution of bins and thermostats collected in Pennsylvania in 2020. The months with the greatest number of thermostats returned were February (921 thermostats, 22 bins) and March (1,095 thermostats, 30 bins). The month with the greatest number of bins returned was March (30 bins). Conversely, the month with the least activity in 2020 was July.



The highest number of thermostats per bin returned occurred in January and May (69.3 and 69.2 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 2020

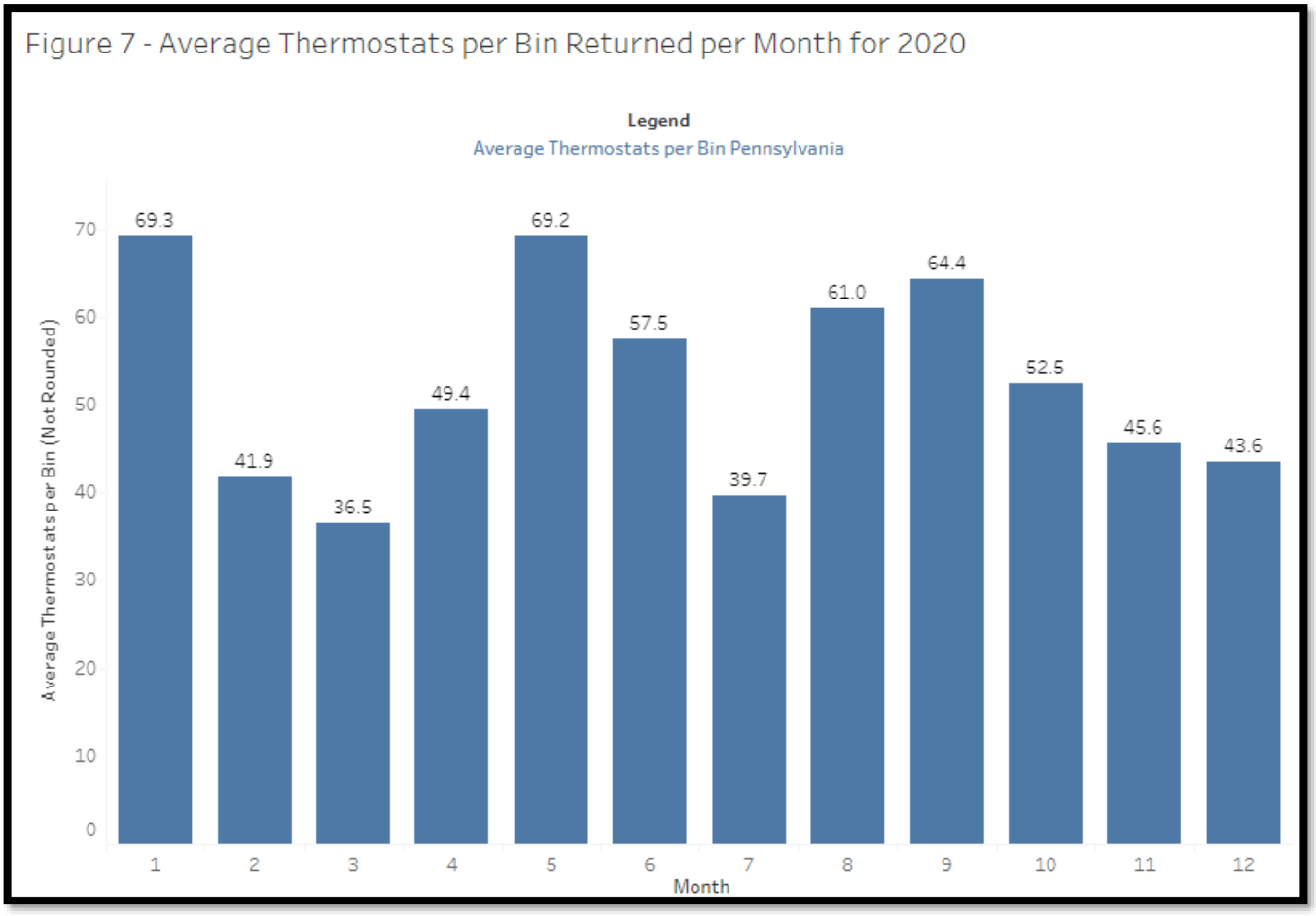


Figure 8 displays the average number of thermostats returned per bin in Pennsylvania and in the U.S. since the beginning of the Pennsylvania program. Nationally, the number of thermostats per bin has been decreasing annually since 2000. In Pennsylvania a similar pattern is observed, with the exception of a few years. The number of thermostats per bin in 2020 (49 thermostats per bin avg.) increased from 2019 (48 thermostats per bin avg.) which is the lowest to date.

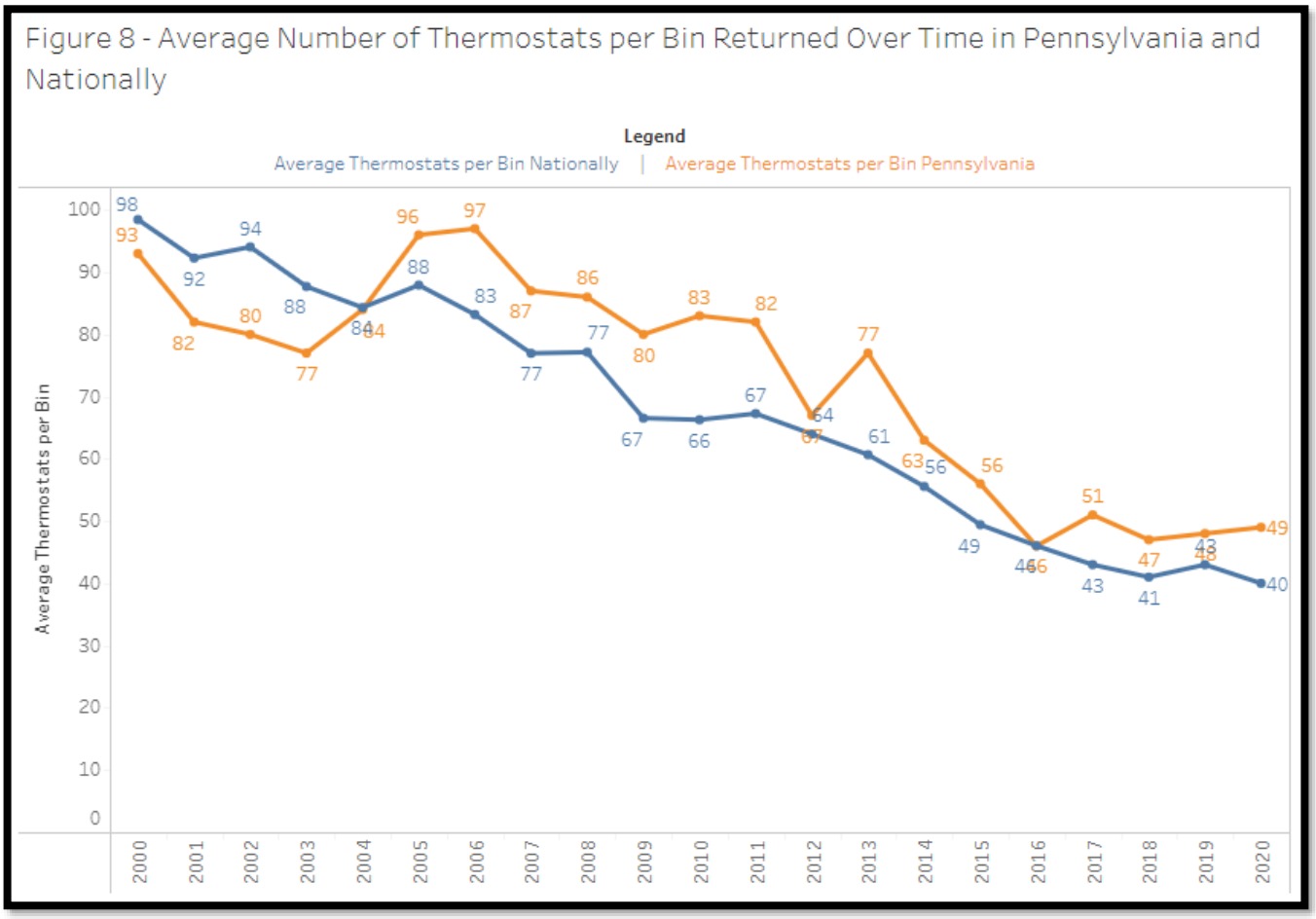
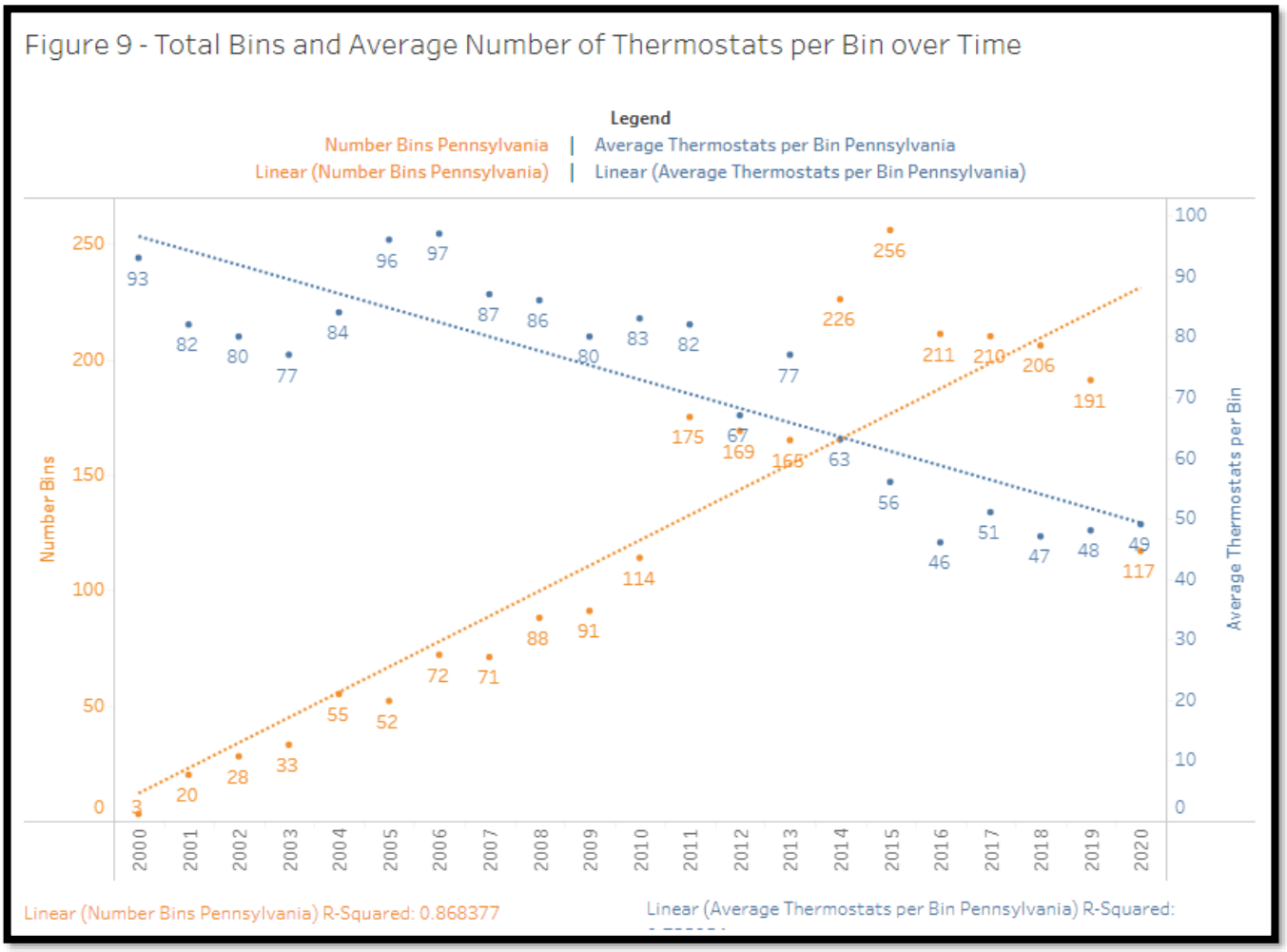
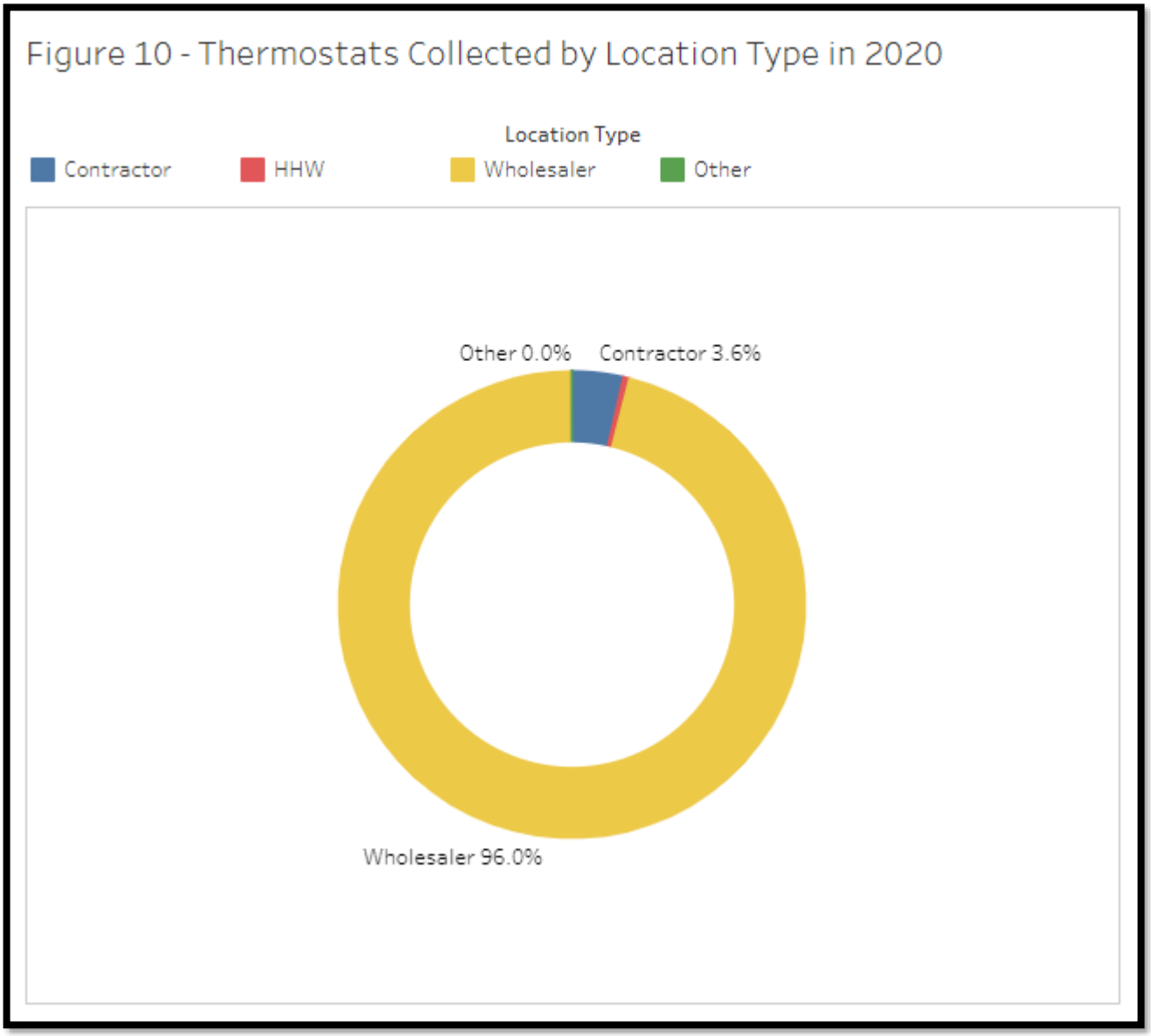


Figure 9 plots the total bins returned over time along with the average number of thermostats per bin over the same period. In general, the number of bins returned in Pennsylvania increased steadily from 2000 to 2015. At the same time, thermostats per bin generally grew until 2006, after which the trend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

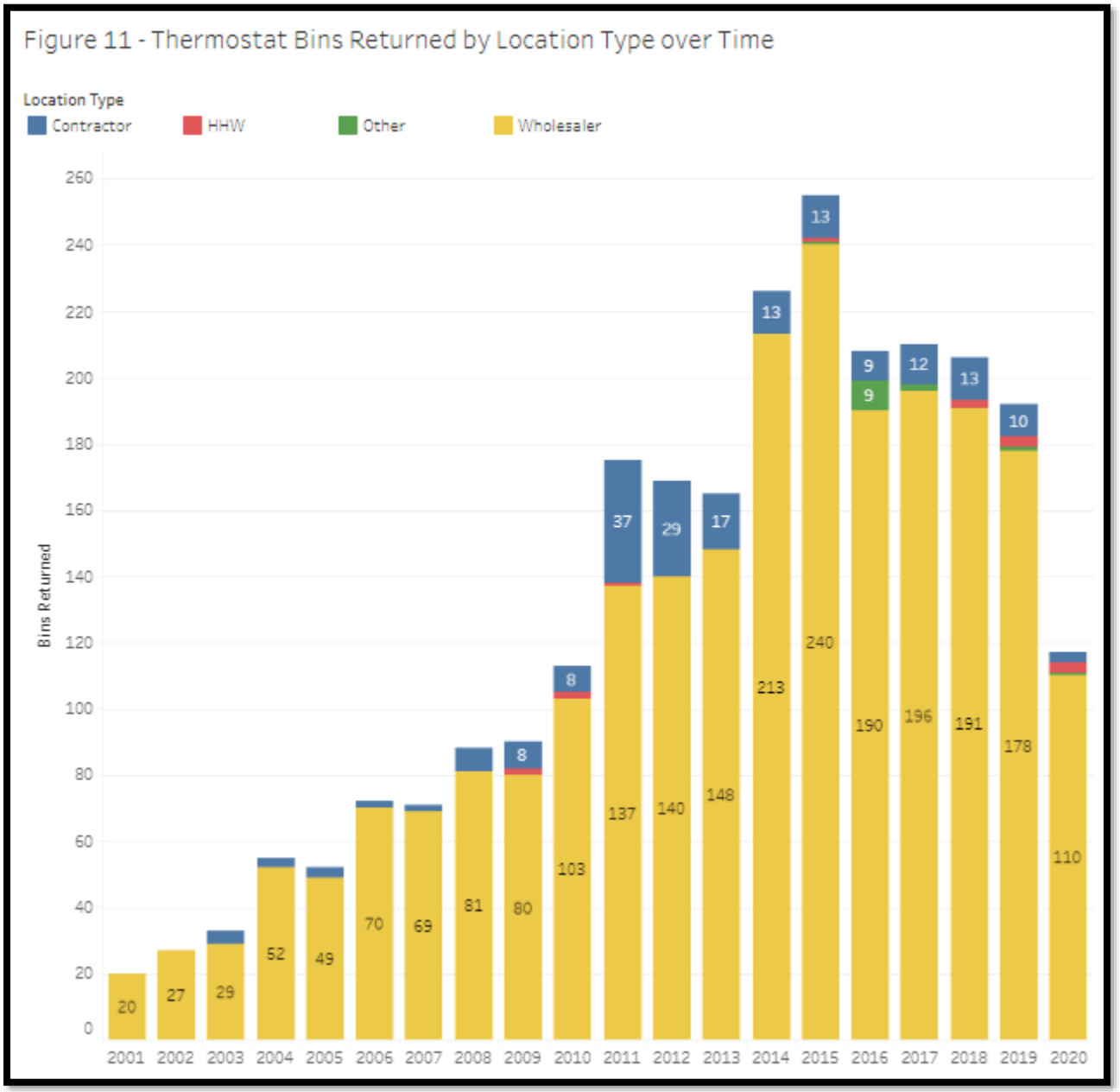


SECTION 2: Channel Partner Analysis

Section 2 of the report examines the partner locations in more detail. Most thermostats collected in Pennsylvania were through wholesalers (96%) with the remaining thermostats collected by contractors and HHWs. Figure 10 shows the distribution of thermostats collected by location type in 2020.



The number of bins returned in 2020 decreased across wholesalers, HHWs and contractors from 2019 levels. Figure 11 displays the change in the number of bins returned by thermostat collection type over time in Pennsylvania.



In 2020, 77% of Pennsylvania locations possessing a collection bin sent back at least one bin for recycling. The distribution is displayed in Figure 12.

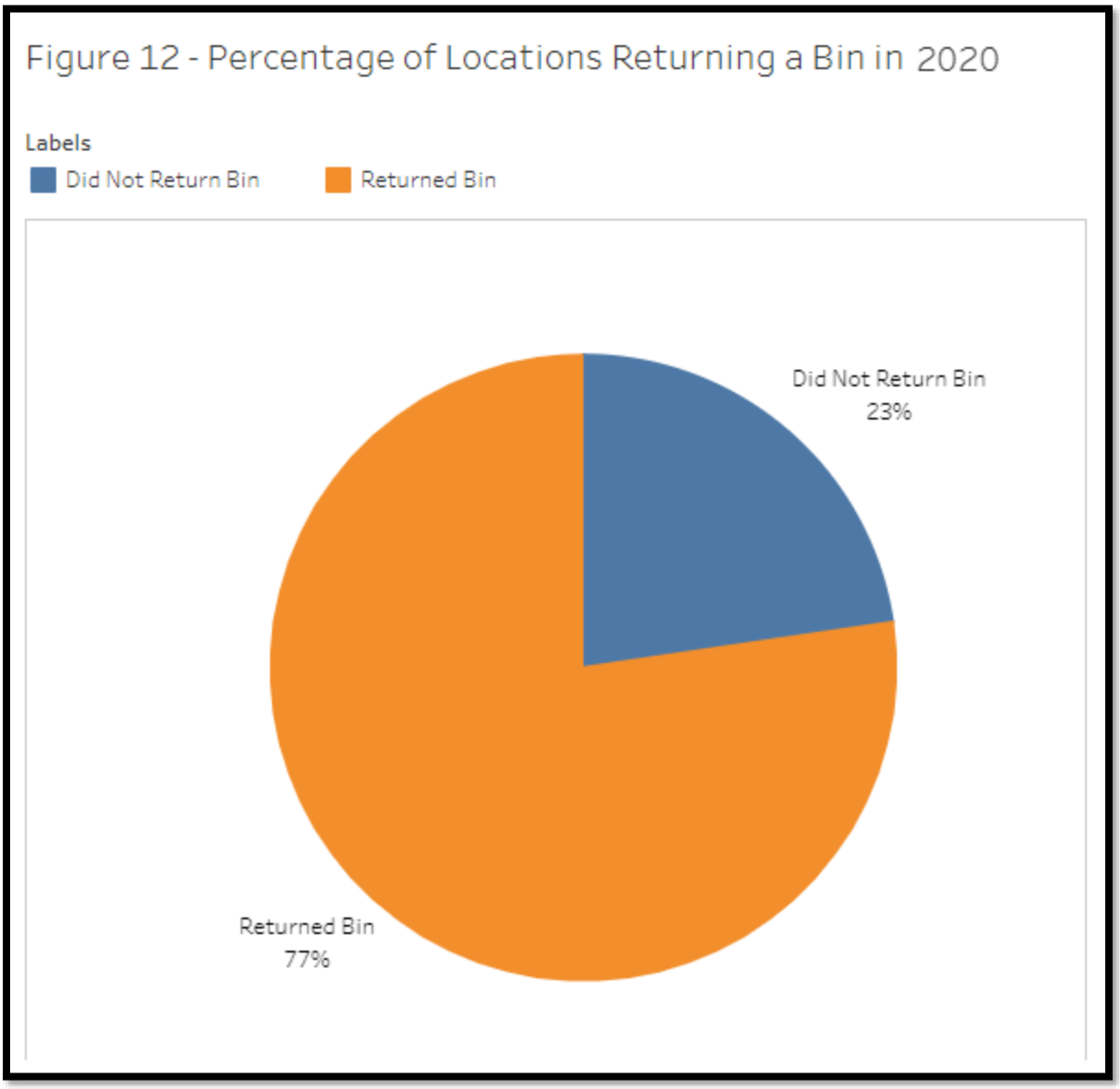


Figure 13 displays the total bins and thermostats returned by county in 2020. An analysis of the top performing counties revealed that Bucks County (13 bins, 752 thermostats), Allegheny County (9 bins, 599 thermostats), and Montgomery County (8 bins, 421 thermostats) returned the greatest number of bins and thermostats in 2020.

Figure 13 - Bins Returned and Total Thermostats Returned 2020 by County

	Number Thermostats	Number Bins
Bucks	752	13
Allegheny	599	9
Montgomery	421	8
Cumberland	420	7
Dauphin	371	7
Berks	359	4
Lancaster	259	5
Philadelphia	242	10
York	236	5
Chester	233	7
Delaware	233	4
Lehigh	206	4
Fayette	196	2
Centre	163	4
Butler	137	2
Mercer	132	1
Westmoreland	105	3
Franklin	96	2
Crawford	91	1
Lebanon	79	1
Blair	43	3
Clearfield	39	3
Cambria	23	1
Erie	22	1
Washington	18	3
Lackawanna	7	1
Luzerne	3	1
Northumberland	2	1

TRC partner R. E. Michel (1,989 thermostats) returned the highest number of thermostats in Pennsylvania in 2020, followed by Johnstone Supply (1,293 thermostats) and APR Supply (671 thermostats). Apart from these locations, 5 program partners returned more than 100 thermostats each. Figure 14 displays the top performers in terms of total thermostats returned in 2020.

Figure 14 - Top 10 Performing TRC Partners in Pennsylvania

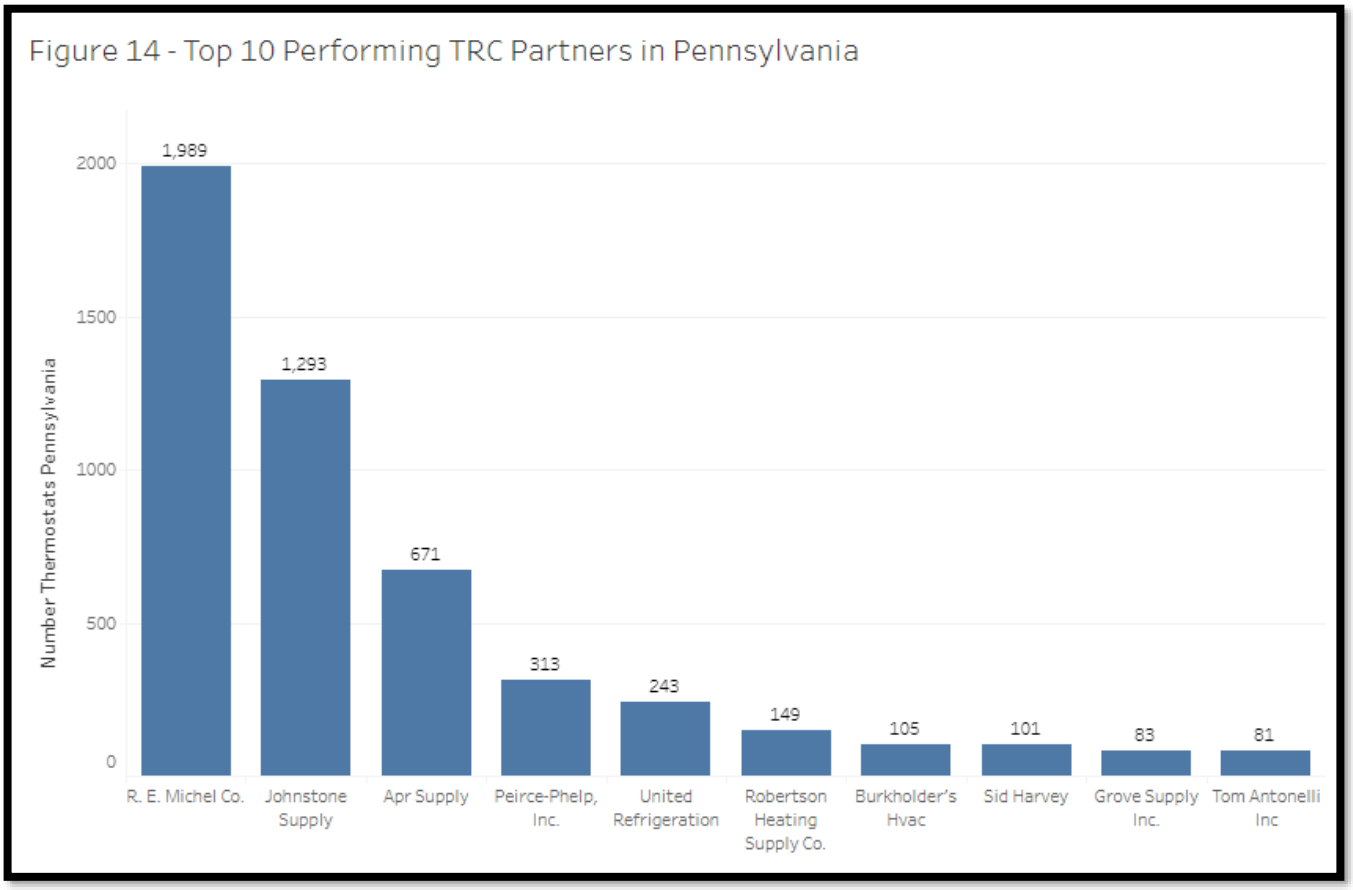


Figure 15 includes the top performers for 2020 by each of the following categories: total bins returned, total thermostats returned, and average number of thermostats per bin.

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.	1,989	31	64
Johnstone Supply	1,293	18	72
Apr Supply	671	9	75
Peirce-Phelp, Inc.	313	4	78
United Refrigeration	243	9	27
Robertson Heating Supply Co.	149	3	50
Burkholder's Hvac	105	1	105
Sid Harvey	101	2	51
Grove Supply Inc.	83	2	42
Tom Antonelli Inc	81	1	81

TRC conducted several activities in 2020 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 2020, a total of 231 '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.

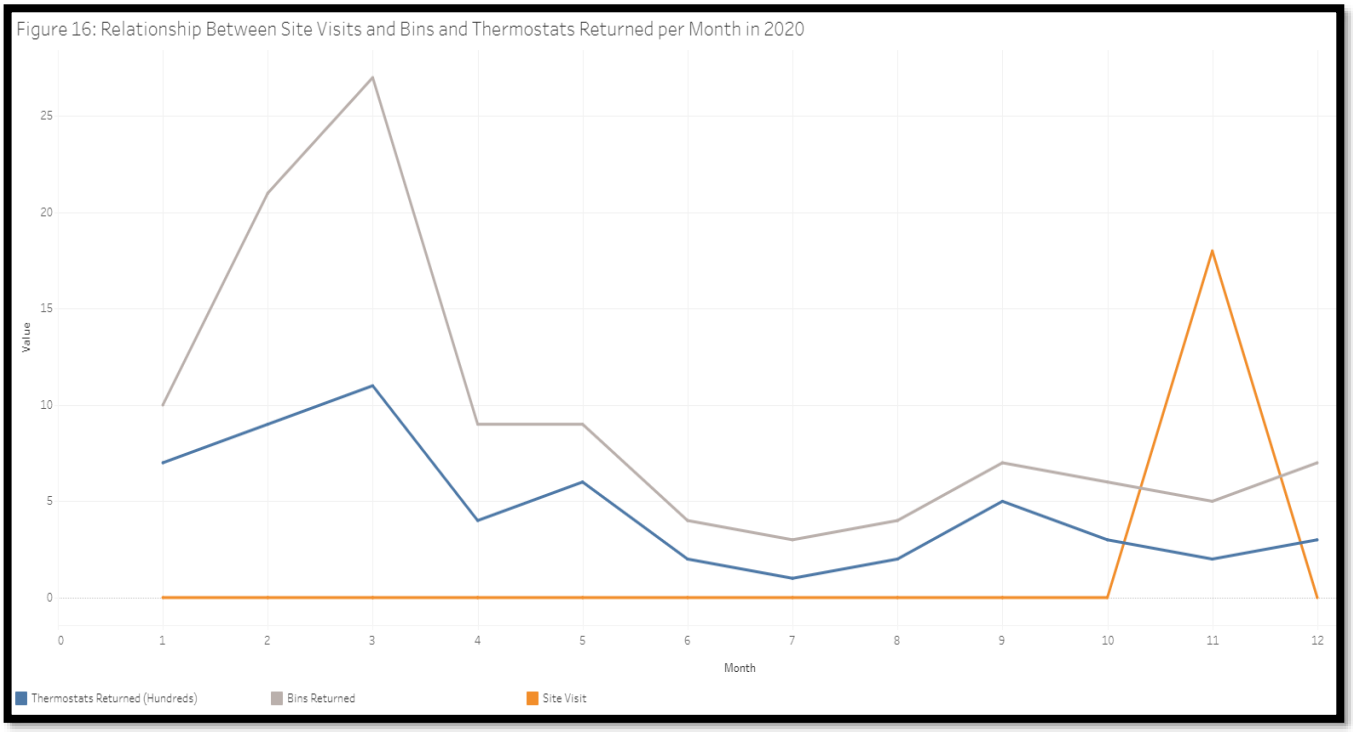
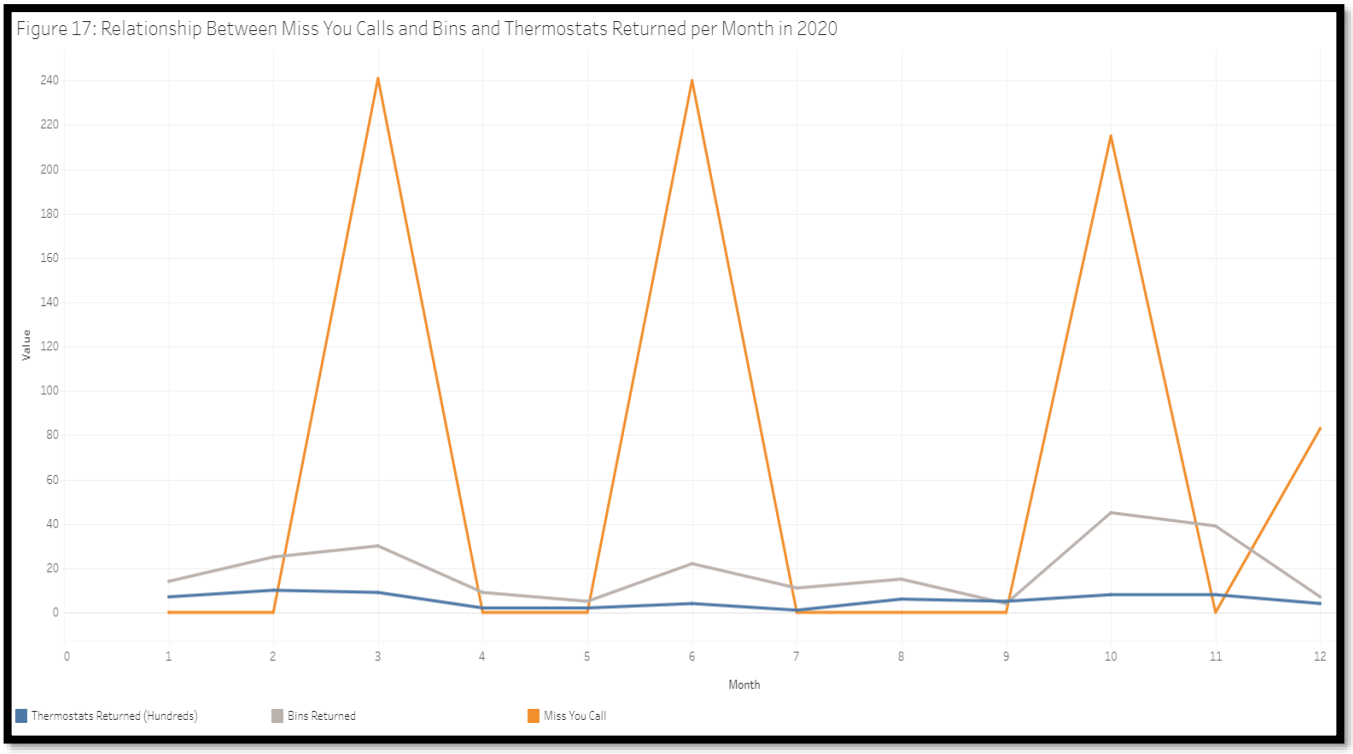


Figure 17 displays the relationship between the number of calls per month, the bins returned per month and the number of thermostats (by 100's) returned per month. Calls were placed in the months of January, May, and September.



SECTION 3: Comparisons to National and Other States' Data

To compare how the Pennsylvania collection partners performed in 2020, 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 19 - Average Number of Bins Returned Per Location Per Year

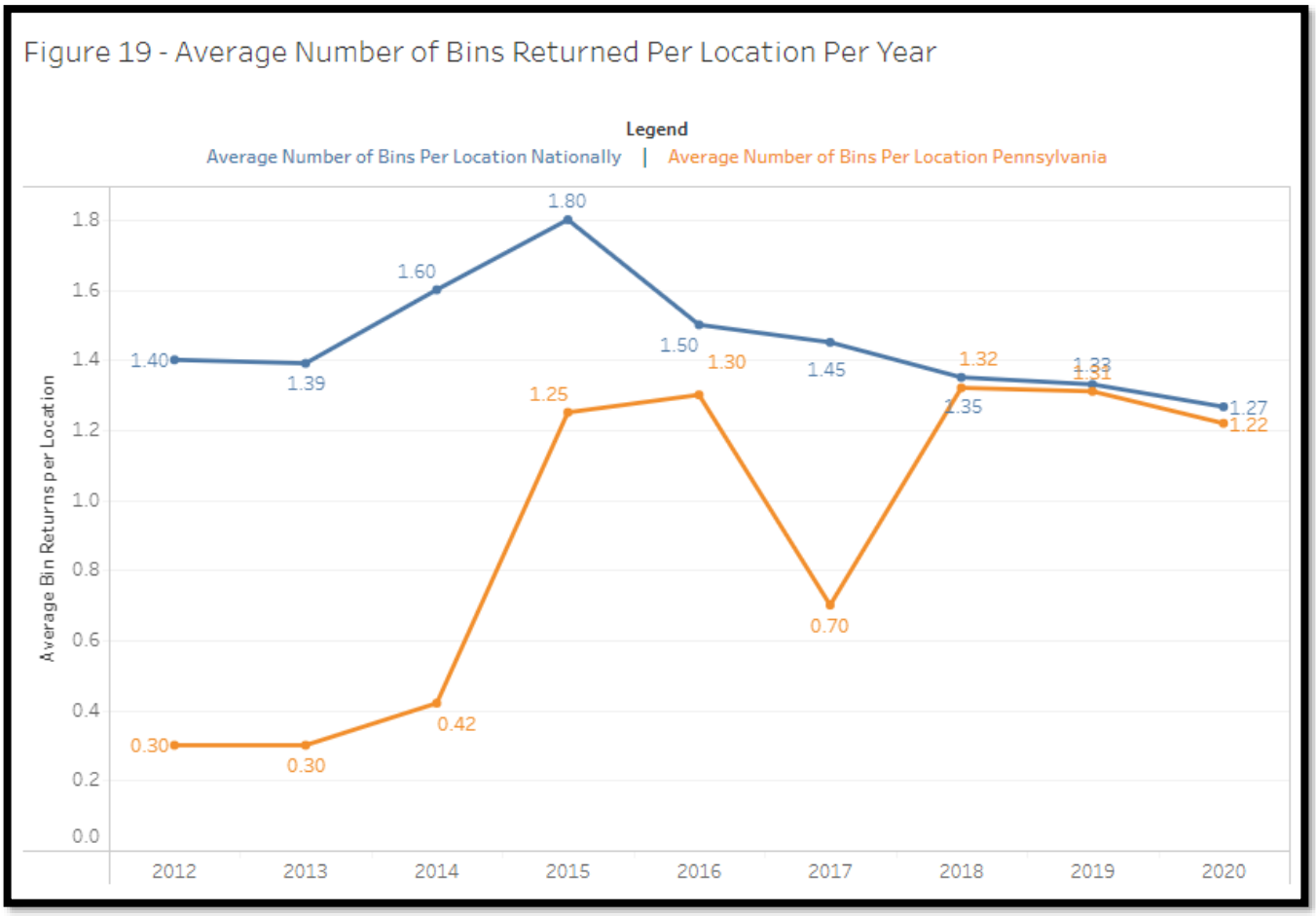


Figure 20 displays the locations in Pennsylvania that returned more than one bin in a given year since 2017, and Figure 21 displays the top 10 partners in the U.S. over the same period in terms of the number of bins returned.

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

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
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

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

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	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

2020

Johnstone Supply	247
R. E. Michel Co.	158
United Refrigeration	87
Ferguson	72
Us Air Conditioning Distributors (USACD)	56
Lennox	47
Watsco	36
Goodman Distribution	47
Sid Harvey	36
Refrigeration Supplies Distributor (RSD)	37

Figure 22 displays total percentage of locations that actively participated in the program (active participation defined as sending back at least one bin) in 2020, 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 2020, 77% of the locations in PA returned at least one bin compared to a national average of 77%. The highest percentage of locations returning a bin in 2020 amongst states that mandate thermostat returns reporting was New Hampshire (82%).

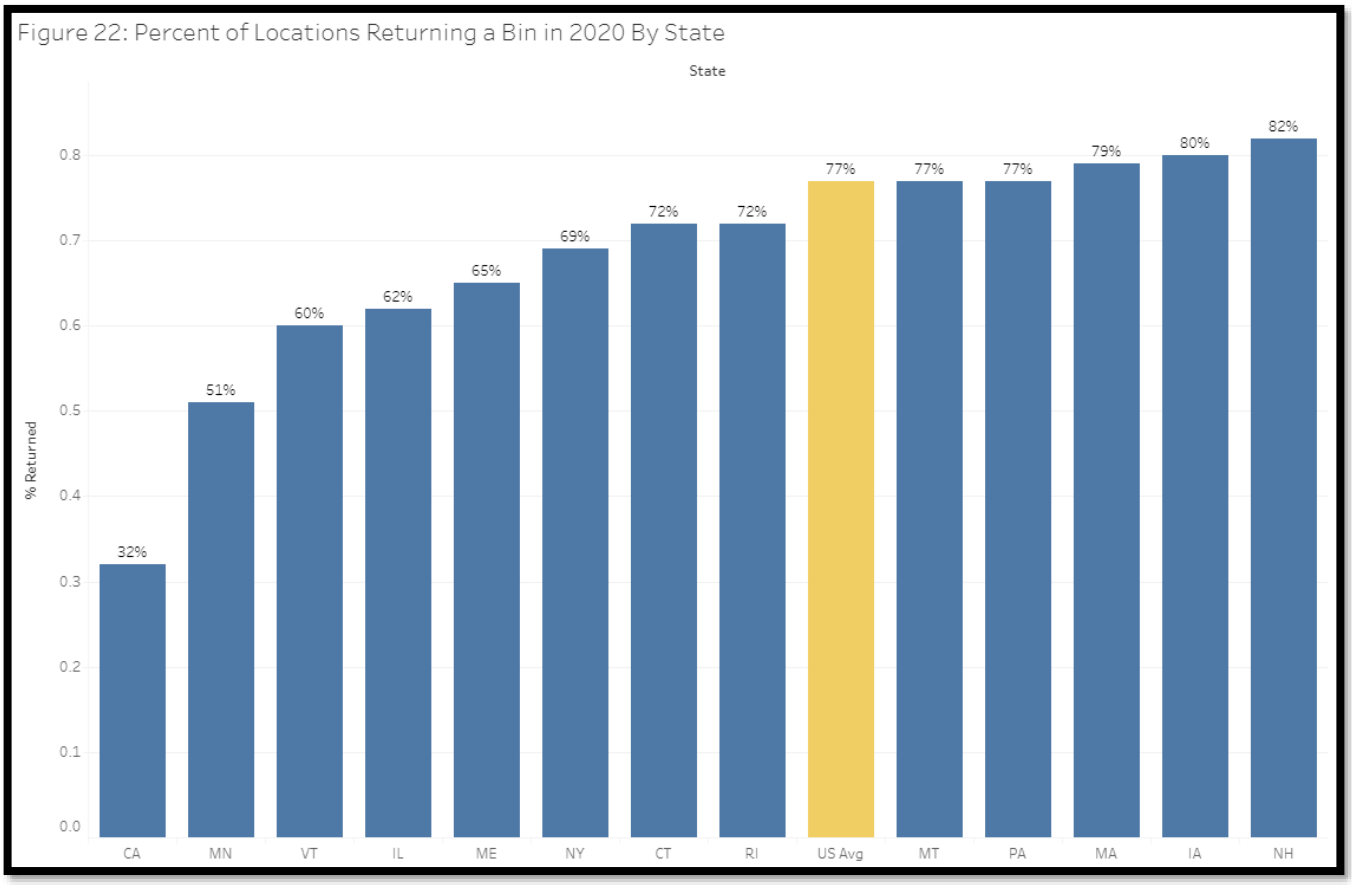


Figure 23 compares the Pennsylvania and national rates for several analytics. These include: total whole thermostats, bins, and loose switches collected, number of thermostats collected by total locations and per actively participating locations, number of thermostats per bin returned on average, equivalent average, number of mercury thermostat equivalents returned in 2020, and finally percent change in mercury thermostat conversion from 2019 to 2020. 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 bin	Average thermostats per bin	Avg thermostats collected per location that returned at least one bin in 2020	Equivalent Average	Thermostat equivalents in 2020	% change over previous year
CA	8,994	366	1,396	4	25	13	1.8282	9,758	-40%
CT	2,240	54	1,577	8	41	11	1.1853	3,571	37%
IA	850	26	588	6	33	7	1.3118	1,298	-74%
IL	6,506	226	1,882	10	29	17	1.1803	8,101	-4%
MA	6,043	105	875	15	58	19	1.1565	6,800	-52%
ME	2,586	76	339	9	34	13	1.0387	2,912	-34%
MN	5,353	73	209	20	73	40	1.1855	5,529	-26%
MT	209	6	102	7	35	9	1.1244	300	12%
NH	934	30	753	4	31	5	1.1670	1,579	-35%
NY	3,384	111	814	5	30	7	1.2024	4,061	-19%
PA	5,733	112	301	13	51	17	1.3366	5,958	-37%
RI	2,473	36	6	39	69	54	1.0453	2,479	-45%
VT	1,897	67	74	7	28	12	1.0838	1,965	-10%
US Avg	1,707	38	521	9	45	12	1.4398	2,069	-38%

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

State	Whole Thermostats	Bins	Loose Switches	Thermostats returned per total # of locations with bin	Average thermostats per bin	Avg thermostats collected per location that returned at least one bin in 2020	Equivalent Average	Thermostat equivalents in 2020	% change over previous year
1	CA	CA	IL	RI	MN	RI	CA	CA	CT
2	IL	IL	CT	MN	RI	MN	US Avg	IL	MT
3	MA	PA	CA	MA	MA	MA	PA	MA	IL
4	PA	NY	MA	PA	PA	PA	IA	PA	VT
5	MN	MA	NY	IL	US Avg	IL	NY	MN	NY
6	NY	ME	NH	US Avg	CT	ME	MN	NY	MN
7	ME	MN	IA	ME	MT	CA	CT	CT	ME
8	RI	VT	US Avg	CT	ME	US Avg	IL	ME	NH
9	CT	CT	ME	MT	IA	VT	NH	RI	PA
10	VT	US Avg	PA	VT	NH	CT	MA	US Avg	US Avg
11	US Avg	RI	MN	IA	NY	MT	MT	VT	CA
12	NH	NH	MT	NY	IL	IA	VT	NH	RI
13	IA	IA	VT	CA	VT	NY	RI	IA	MA
14	MT	MT	RI	NH	CA	NH	ME	MT	IA

2020 Collections by Brand

In Pennsylvania, Thermostat Recycling Corporation (TRC) recovered the equivalent of 5,958 mercury thermostats from 5,733 whole mercury thermostats plus 301 mercury switches removed from thermostats. A total of 49.4 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 Mercury
Bard Manufacturing Corporation	0	0	0
Burnham Holdings, Inc	0	0	0
Carrier Corporation	18	43	0.2666
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	436	533	3.3046
Empire Comfort Systems	0	0	0
General Electric Corporation	20	54	0.3348
Goodman Global	27	56	0.3472
Honeywell Home	4790	6123	37.9626
Hunter Fan Company	0	0	0
ITT Corporation	1	1	0.0062
Lennox International Inc.	111	188	1.1656
Marley-Wylain Company	0	0	0
Nest	0	0	0
Nortek Global HVAC	0	0	0
Rheem Manufacturing Company	25	39	0.2418
Schneider Electric (Invensys Controls)	37	41	0.2542
STLPC Corporation (f/k/a Lux Products Corporation)	18	21	0.1302
Taco Comfort Solutions	0	0	0
TPI Corporation	0	0	0
Trane Residential Systems	211	515	3.193
Uponor, Inc.	0	0	0
Vaillant Corporation	0	0	0
W. W. Grainger	0	0	0
York/Johnson Controls	23	33	0.2046
Non-Member Brands			
PSG Controls	1	1	0.0062
Sears Holdings	15	15	0.093
NOM (Manufacturer not identifiable)			
Loose Switches	0	301	1.8662
Total	**5733**	**7964**	**49.3768**

2020 Summary of the Program Expenses

Below is a summary of program expenses for the Pennsylvania collection program in 2020. 2020 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	2019	2020	Difference
Direct Expense for Marketing & Outreach	$ 1,290.20	$ 2,430.00	$ 1,139.80
Incentive/Promotional Payments	$ -		$ -
Legal	$ -		$ -
New Collection Containers	$ -		$ -
Recycling Costs	$ 37,129.89	$ 21,433.66	$(15,696.23)
Travel	$ 247.03		$ (247.03)
TRC Staff & Administration	$ 188.18	$ 475.00	$ 286.82
Total Expenses	**$ 38,855.30**	**$ 24,338.66**	**$(14,516.64)**

2020 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.