



Wisconsin residents and electronics recycling

Results from the Wisconsin DNR's 2016 household electronics recycling survey

May 2017

Executive summary

Wisconsin's electronics recycling law requires the Department of Natural Resources to promote public participation in E-Cycle Wisconsin through education and outreach activities. To fulfill this mandate effectively and to help inform program administration and policy, the DNR has conducted four statewide household surveys since 2010, asking residents what they have done with unwanted electronics, how many electronics are in their homes, what makes it difficult to recycle electronics and other related questions. The DNR also asked questions related to electronics recycling on a 2006 recycling survey, the results of which allow for some comparison with conditions before the law's 2010 implementation.

The 2016 survey indicated the number of electronics in Wisconsin homes has continued to increase. The most dramatic rise was the number of computers (from 5.9 million in 2013 to 7.3 million in 2016, perhaps due to the increased popularity of tablets). Approximately 22 percent of TVs, 29 percent of computers and 48 percent of cell phones in homes were unused in 2016, indicating there remains a large amount of material available for recycling.

When it comes time to dispose of these devices, nearly twice as many Wisconsinites were certain of where to take electronics for recycling in 2016 (45 percent) than in 2013 (28 percent). Awareness about Wisconsin's electronics recycling program also increased, with 28 percent of residents aware of E-Cycle Wisconsin in 2016, compared with 23 percent in 2013. Awareness of the electronics disposal ban continued to decline, from 58 percent of residents in 2013 to 50 percent in 2016. The rise in certainty of where to recycle and the drop in disposal ban awareness may reflect a change in DNR outreach messaging over the past few years, along with the time elapsed since the electronics disposal ban took effect in September 2010.

As in previous surveys, electronics recycling awareness varied by geography and demographic group, indicating possible areas for targeted outreach. Females, younger residents and people living in the northern and south central parts of the state were least likely to be aware of the disposal ban and E-Cycle Wisconsin, or to be certain of where to take electronics for recycling.

Regardless of program awareness, nearly all Wisconsin residents continued to recycle and reuse old devices rather than put them in the trash. The survey asked respondents what they had done with a computer, TV or cell phone they no longer wanted in the past 12 months, and recycling devices or returning them to retailers (which generally leads to reuse or recycling) were the most popular disposal methods. However, 40 percent of those who said they no longer wanted a TV, and more than half who no longer wanted a computer or cell phone, had simply stored the devices.

Among the 21 percent of respondents that reported being unable to recycle electronics during the previous

12 months despite wanting to do so, the most common factor in 2016 was not knowing where or how (32 percent), followed by data security concerns (20 percent), a category that was included for the first time on the 2016 survey.

Key takeaways from the 2016 survey include:

- There is still a lot of material to recycle. Based on the 2016 survey, the DNR estimates there are more than 8 million TVs, computers and cell phones in state households that are no longer being used.
- The surveys have shown increasing recycling of electronics over the years, but in 2016, the percentage of respondents who had put TVs and computers in the trash also increased. This is something to watch, and indicates there is room for collectors, recyclers and manufacturers to more strongly promote computer recycling, which is often free.
- Residents' level of concern over data security indicates this is an area on which the DNR and electronics collectors and recyclers should focus more attention.
- The increased awareness of E-Cycle Wisconsin and where to recycle electronics is a welcome sign, and indicates the DNR's increased public outreach efforts may be having a positive effect. Still, nearly one-third of residents don't know where to recycle electronics, and this was the top reason cited for being unable to e-cycle, so there is more work to be done. Survey results indicate helping local recycling programs inform their residents about electronics recycling is still one of the most effective tactics the DNR can use..

Survey background

Wisconsin's electronics recycling law took effect in January 2010, with a ban on landfilling and incinerating many consumer electronics taking effect Sept. 1, 2010. The law (s. 287.17, Wis. Stats.) establishes a statewide program, called E-Cycle Wisconsin, to collect and recycle certain electronics. It is based on a product stewardship approach, in which electronics manufacturers fund collection and recycling programs for their products.

The law requires the DNR to promote public participation in the manufacturer-funded E-Cycle Wisconsin program. To gauge success in fulfilling this requirement, the DNR's Waste and Materials Management Program contracted the University of Wisconsin Survey Center to conduct household recycling surveys of Wisconsin residents in 2010, 2011 and 2013. In 2016, the Waste and Materials Management Program worked with the DNR's Science Services Bureau to conduct the survey. Results from a 2006 DNR recycling survey that included questions about electronics recycling are also used for comparison.

The sample was random and statistically valid for all surveys, allowing us to project responses to the statewide population and compare results across survey years. The demographics of respondents across the first four surveys were similar enough that it is reasonable to compare answers between years. The 2016 survey over-sampled the northern part of the state, but this over-sampling was corrected for in survey analysis, making comparisons across all five surveys possible. In all surveys, the 18-to-35-year-old demographic was under-represented.

The 2016 survey was mailed in February 2016 and had a response rate of 49 percent. This was lower than in previous years, though consistent with the response rates the DNR has been receiving for other mailed surveys of the general public.

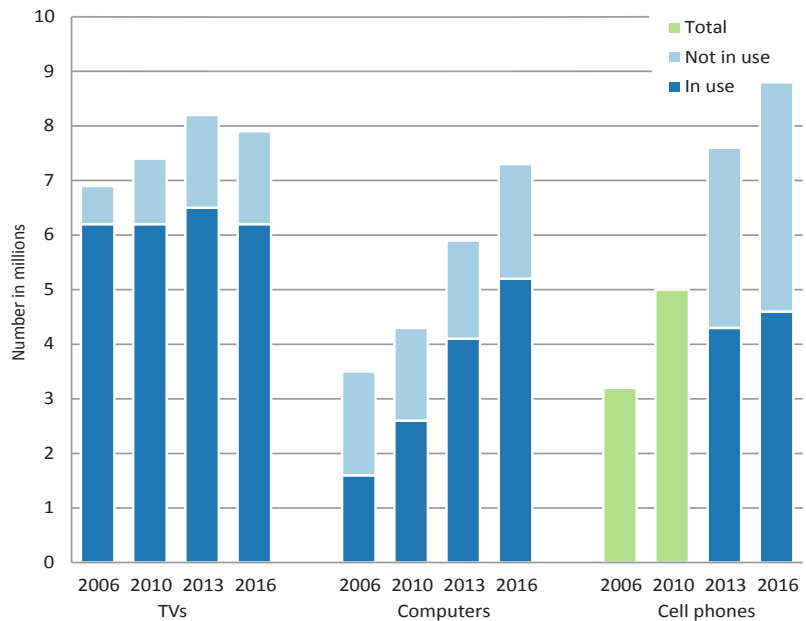
For more survey details and a discussion of demographics, see Appendix A.

Number of electronics in Wisconsin households

As in previous years, the 2016 survey asked respondents how many computers, TVs and cell phones they had in their homes. Based on their answers, the DNR estimates Wisconsin households had a total of 7.9 million TVs, 7.3 million computers (including desktops, laptops and tablets) and 8.8 million cell phones in 2016. These estimates show an increase in computers and cell phones, but a slight decrease in the number of TVs. The decrease in the number of TVs could be due to the DNR’s methods of estimation, or it could be due to changes in household electronics (such as mobile devices taking the place of some traditional TVs) or residents disposing of unused TVs. Up to this point, the trend in Wisconsin has been toward an increasing number of electronics in all categories.

The survey also asked respondents how many of each of the electronic devices were currently not in use. Twenty-two percent of TVs, 29 percent of computers and 48 percent of cell phones in peoples’ homes were not being used (see Table 1). This translates into approximately 1.7 million TVs, 2.1 million computers and 4.2 million cell phones ready for disposal. This is a large increase in the number of cell phones ready for disposal over 2013 estimates, a slight increase in the number of computers and a relatively stable number of TVs (see Figure 1). These 8 million devices sitting

Figure 1: Estimated number of electronics in Wisconsin households over time, in millions



The “not in use” question was not asked for cell phones in 2006 and 2010.

Table 1: Estimated number of electronics in WI households, 2016

Device	Average # per household	Total in state households	Total unused
TVs	3.46	7.9 million	1.7 million (22%)
Computers	3.17	7.3 million	2.1 million (29%)
Cell phones	3.82	8.8 million	4.2 million (48%)

Figure 2: Where respondents purchased electronic devices (TV, tablet or computer) in the past 12 months



unused in homes reinforces the importance of informing Wisconsin residents on how to find responsible reuse or recycling choices.

In a change from previous years, the 2016 survey also asked respondents whether they had purchased a TV, tablet or computer in the past 12 months, and if so, where they had purchased the device. The DNR asked this question to get a sense of which retailers are the most heavily used in the state. The DNR’s E-Cycle Wisconsin team has been working to improve retailer compliance with Wisconsin’s electronics recycling law, and the survey results will help show which retailers might need the most attention, and whether there are popular retailer outlets that have not received DNR compliance assistance.

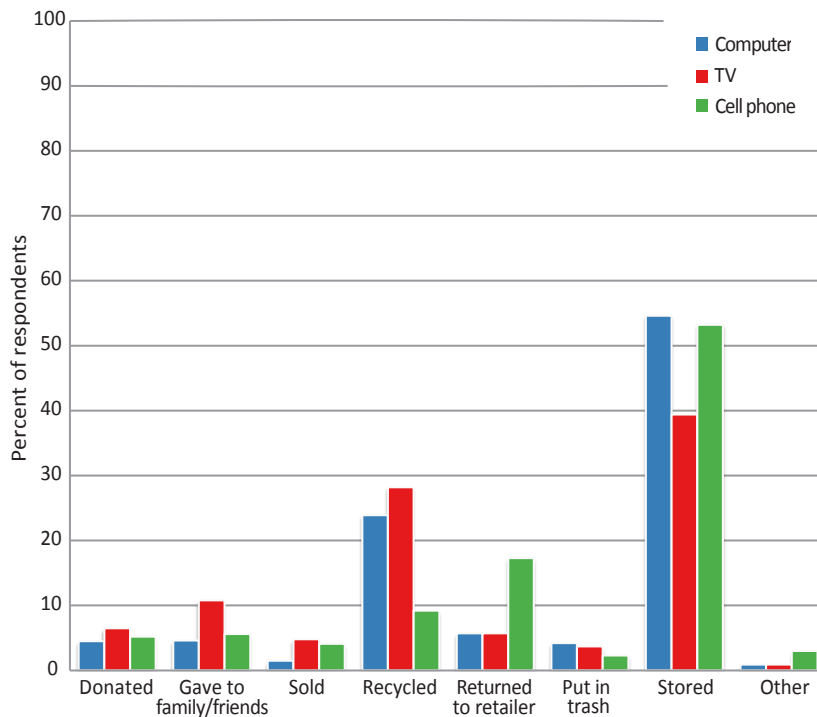
In the 12 months preceding the survey, 40 percent of respondents had purchased a new device. Of those, more than three-fourths had purchased new devices in brick-and-mortar stores instead of online. Most of those who had purchased online had the new device delivered directly to their home, rather than shipped to a store. The most common place to survey respondents purchased electronics, by far, was Best Buy (see Figure 2). Walmart/Sam’s Club, Amazon and Target were also popular choices, as were mobile device stores. Office Max, Shopko, Kmart/Sears, Costco, local computer stores and furniture/appliance stores all had a handful of mentions but are lumped in with the “other” category to simplify the pie chart.

Electronics disposal choices

The 2016 survey asked questions about electronics disposal in a different way than in previous years and, more importantly, added two new response categories. The new categories offered, “exchanged/returned to retailer” and “stored,” dramatically changed the disposal results when compared with previous years. The results for 2016 show that more than half the respondents who had a computer or cell phone they “no longer wanted” put the item in storage, rather than use a recycler or other disposal method. Nearly 40 percent of people who no longer wanted a TV also put it in storage.

With “stored” responses removed, recycling was the most common answer for computers and TVs, while

Figure 3: WI household electronics disposal methods, 2016



for cell phones, exchanging/returning to a retailer was about twice as common as recycling (see Figure 3). In most cases, the phones returned to retailers are refurbished or recycled, and when respondents to earlier surveys had written “returned to retailer” as an “other” response, this was recoded “recycled.”

While comparisons between 2016 and earlier results should be done with caution due to the change in question format, the survey showed positive trends in how residents were managing unwanted electronics. The percentage of 2016 respondents who reported recycling TVs or computers was higher than in previous surveys,

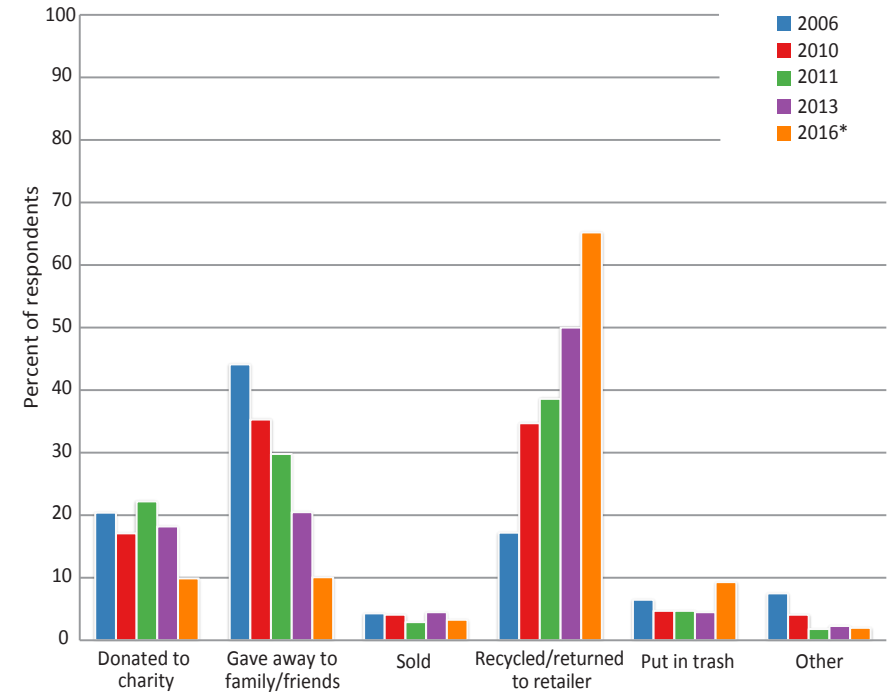
and the “recycled” percentage was much higher for all device types with the 2016 “recycled” and “exchanged/returned to retailer” percentages combined. The share of respondents that had donated, sold, or given a device away to family or friends was much lower in 2016 than in 2013, perhaps indicating the appeal of older devices has waned.

While the trend toward more recycling was very strong, the 2016 survey showed a concerning increase in residents putting computers and TVs in the trash. The percentage of respondents reporting they had put computers in the trash in 2016 was higher than all other surveys, at 9.3 percent (more than double the 4.5 percent in 2013). This percentage of respondents putting TVs in the trash was also up slightly, from 4.5 percent in 2013 to 6.1 percent in 2016 (but still lower than in earlier surveys). The one bright spot was cell phones—the percentage of respondents putting these in the trash in 2016 was at its lowest level since the DNR began conducting these surveys, at just 4.9 percent.

The increase in trashing computers is especially surprising because, unlike TVs, there are many free options for recycling computers around the state. It could be the survey numbers are just off—a relatively small number of respondents answered these disposal questions, and if the 2016

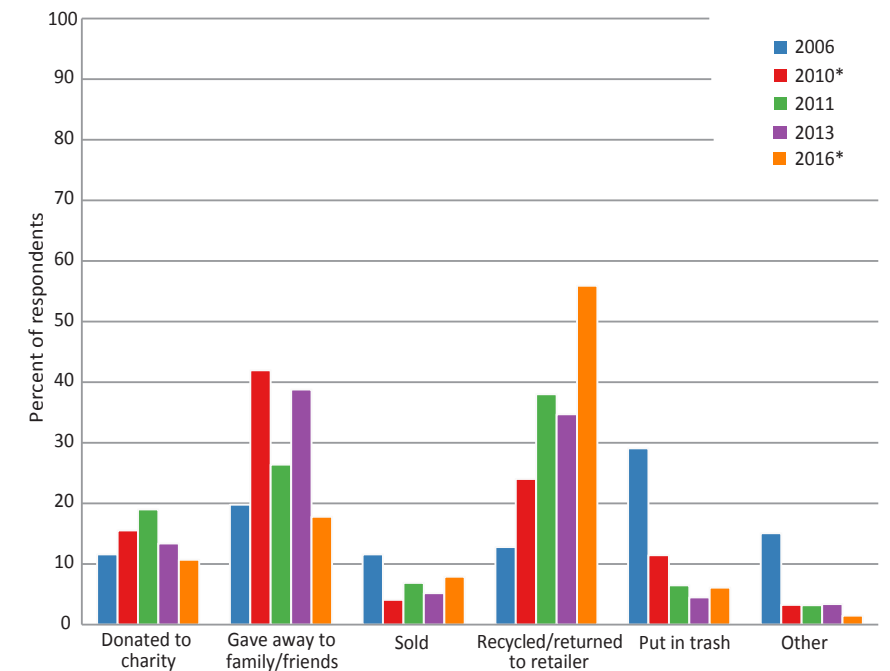
data are adjusted to be more representative in terms of respondent age, the trash rates for all three devices are lower. If there has been a true increase, it could be due to data security concerns (as discussed below, this emerged as one of the primary reasons respondents gave for not recycling). In any case, it suggests an opportunity for responsible collectors and recyclers to promote computer recycling more strongly—something that could help their bottom lines, since computers generally have a positive recycling/reuse value.

Figure 4: Computer disposal methods over time



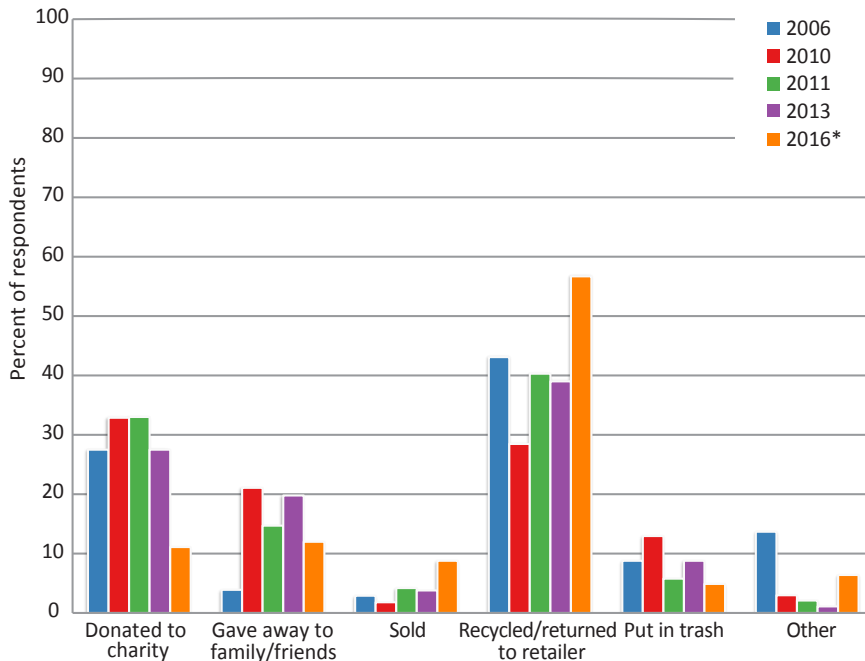
* “Stored” response category removed.

Figure 5: TV disposal methods over time



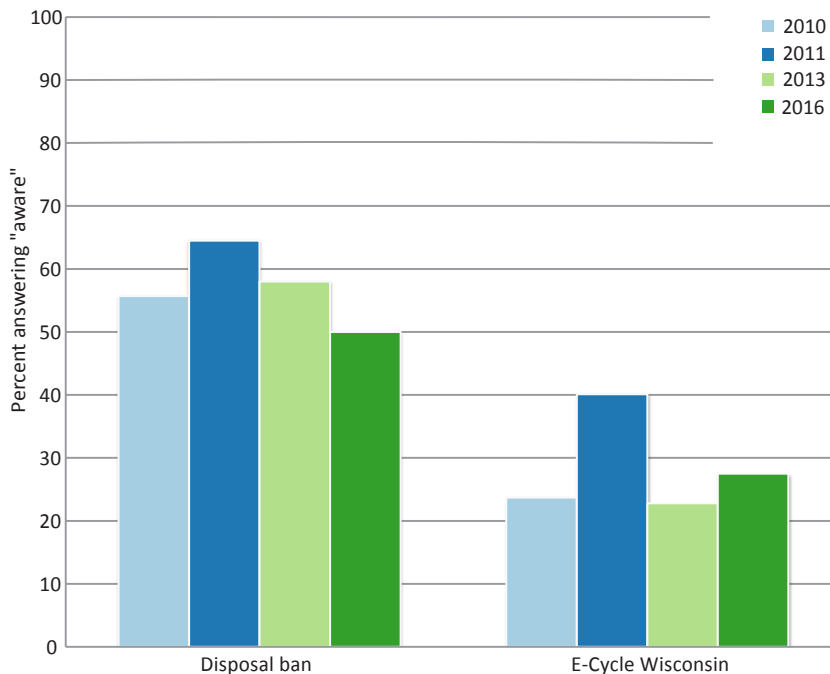
* “Stored” response category removed.

Figure 6: Cell phone disposal methods over time



* "Stored" response category removed.

Figure 7: Wisconsin household awareness of electronics disposal ban and E-Cycle Wisconsin, over time



described in the section above, recycling and returning items to retailers remain the most popular methods of electronics disposal in 2016. The end goal of the electronics recycling law is to keep electronics out of landfills, and this appears to still be happening, even as awareness of the disposal ban falls.

Figures 4, 5 and 6 show disposal trends over time for each device type.

Public awareness of the law and where to e-cycle

After rising in 2011, following the implementation of the electronics recycling law, awareness of the electronics disposal ban has continued to fall. Awareness of E-Cycle Wisconsin, however, rebounded in 2016 to its highest level except in 2011 (see Figure 7). Residents' knowledge of where to recycle electronics also rose between 2013 and 2016 (see Figure 8). In 2016, 45 percent of respondents said they were "certain" of where to take electronics for recycling, compared with only 28 percent in 2013. The number of respondents who "don't know" where to take electronics for recycling dropped from 40 percent to 33 percent in that time period.

The changes in awareness likely reflect both the passage of time since heavy media coverage surrounding the law's initial implementation and the DNR's outreach efforts over the past few years, which have focused on helping people find responsible places to recycle old electronics. "E-Cycle Wisconsin can help you find a collection site near you" has been the focus of DNR advertising campaigns, rather than an emphasis on the details of the law. As

Awareness details

Respondents who knew about the disposal ban and/or E-Cycle Wisconsin were more likely to recycle or reuse computers and cell phones and less likely to store them or put them in the trash than respondents who were unaware of the ban/program. These relationships, found in previous years as well, make continued effort to inform the public about E-Cycle Wisconsin and the disposal ban a worthy endeavor.

Additionally, respondents who were certain they knew where to take electronics for recycling were less likely to put TVs, computers or cell phones in the trash or store them, and more likely to recycle them, than respondents who didn't know or were not certain where they could take electronics for recycling (see Table 2). This reinforces the need for continued public education about electronics recycling, even if people don't always remember the specifics of the law.

Identifying which segments of the population are least aware of the disposal ban, E-Cycle Wisconsin, and where to recycle electronics is one of the DNR's primary reasons for conducting a household survey. The results from these questions inform the need for program or policy changes and direct the DNR's outreach goals. The 2016 survey asked a few different demographic questions and categorized ages slightly differently than in past surveys, which

provided some new information to consider. The 2016 survey did not ask about household income, but did ask about the respondent's gender and commitment to recycling. For the analysis, age categories dropped from four to three, which changed the "young" age range to 18 to 44 (instead of 18 to 30), the middle

Figure 8: Knowledge of where to take electronics for recycling, over time

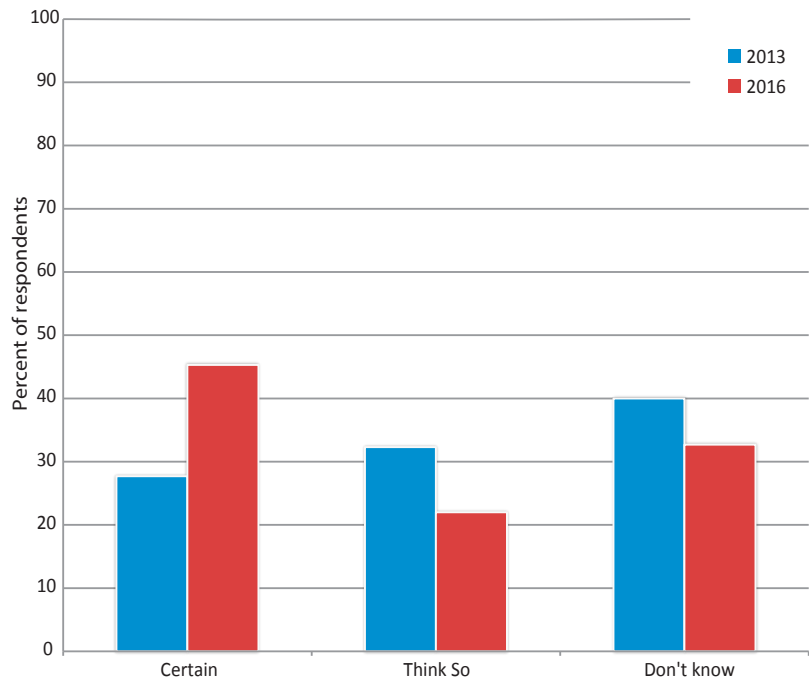


Table 2: Electronics disposal method compared with knowledge of where to e-cycle, 2016

Disposal method	Certain	Think so	Don't know
TVs			
Put in trash	1%	11%	3%
Recycled	42%	25%	7%
Reused	19%	20%	27%
Returned to retailer	10%	1%	3%
Stored	27%	42%	59%
Computers			
Put in trash	2%	6%	5%
Recycled	43%	13%	6%
Reused	12%	9%	8%
Returned to retailer	10%	3%	4%
Stored	33%	69%	78%
Cell phones			
Put in trash	0%	5%	4%
Recycled	15%	5%	5%
Reused	21%	8%	14%
Returned to retailer	22%	18%	12%
Stored	43%	65%	65%

Figure 9: Percent of respondents aware of disposal ban, by demographic category, 2016

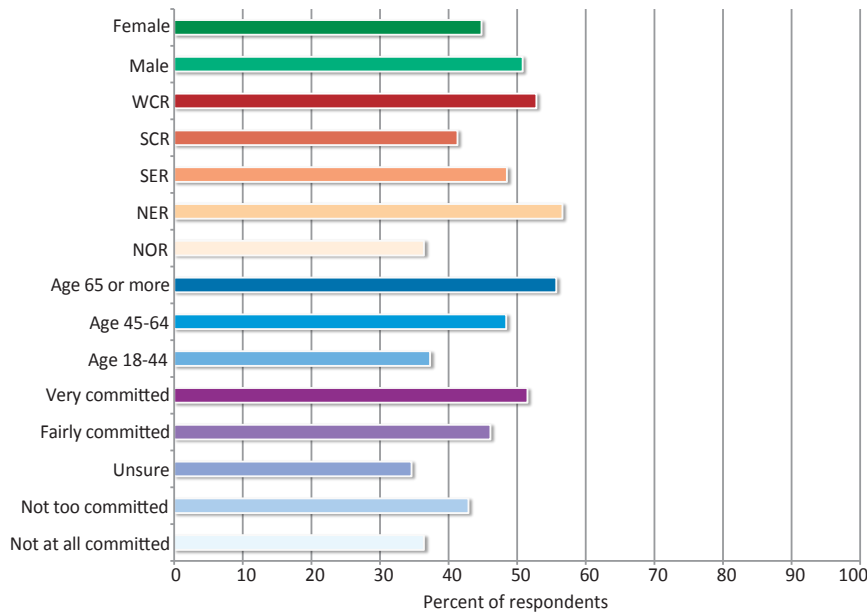
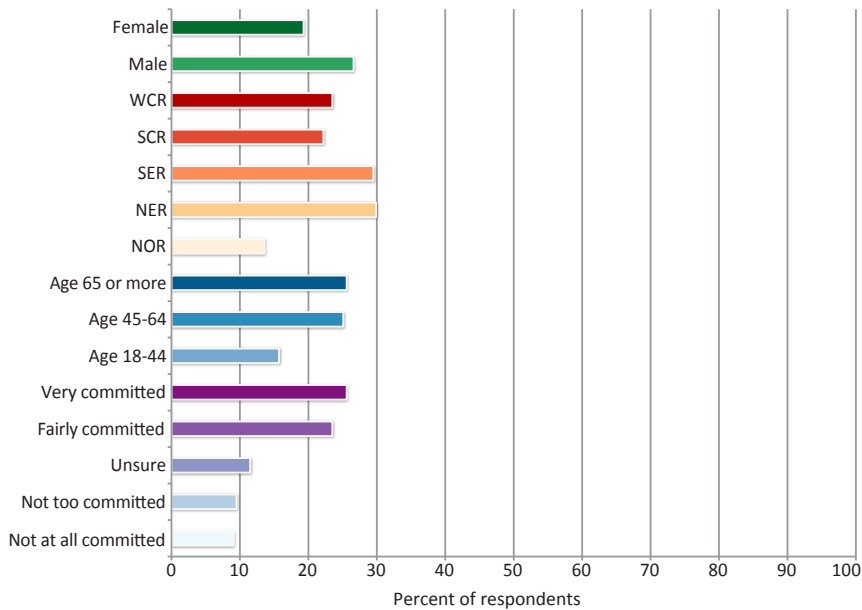


Figure 10: Percent of respondents aware of E-Cycle Wisconsin, by demographic category, 2016



questions showed, perhaps unsurprisingly, that those who consider themselves “not at all committed” to recycling, “not too committed” and “unsure” of their commitment were less aware of the ban and E-Cycle Wisconsin than those that were “somewhat committed” or “very committed” to recycling. These same “uncommitted” groups were also less certain of where to recycle electronics and less aware of Wisconsin’s general recycling laws.

Females appeared to be less aware of the ban and E-Cycle Wisconsin than males, but in neither case were the results strong enough to be considered statistically significant. The relationship also did not seem to

to 45 to 64 and the oldest to 65 and older. This provided a larger sample size in each group for statistical analysis.

In general, the populations with the lowest awareness of E-Cycle Wisconsin and the disposal ban have not changed since the first surveys. As in 2010, 2011 and 2013, the 2016 survey showed that among age groups, younger respondents are least aware of the ban and E-Cycle Wisconsin (see Figures 9 and 10).

There also continues to be variation in awareness across regions of the state, with the DNR’s Northern Region remaining the least aware of both the ban and E-Cycle Wisconsin. (Respondents were grouped by county. For a map showing DNR regions, see Appendix C). While the Northern Region has always been the least aware of E-Cycle Wisconsin and the ban, it has also continued to steadily lose awareness over time, as has the South Central Region. Interestingly, that is not the case across all regions. Awareness of the ban has dropped across the state, but some regions have seen a resurgence of awareness of E-Cycle Wisconsin. The Southeast Region, in fact, has almost returned to 2011 levels of awareness (see Figure 11).

One of the new demographics

affect disposal choices, with little difference in the percentages of males and females putting electronics in the trash. In general, women were more likely to give away, sell or donate old devices, while men were more likely to recycle them.

Demographic analysis of knowledge of where to recycle electronics showed similar results to those described above for disposal ban and E-Cycle Wisconsin awareness, with a few exceptions (see Figure 12). There was a statistically significant difference between males and females on this question, with females being less certain of where to take electronics for recycling than males; and the West Central Region, despite having lower ban/E-Cycle Wisconsin awareness levels than the Northeast Region, had the highest percentage of respondents certain of where to take electronics for recycling.

Analysis of demographic questions about residential setting (urban/rural), home ownership status and presence of children in the household did not indicate statistically significant relationships with awareness of the ban, E-Cycle Wisconsin, or where to recycle electronics.

Figure 11: Changes in regional awareness of E-Cycle WI

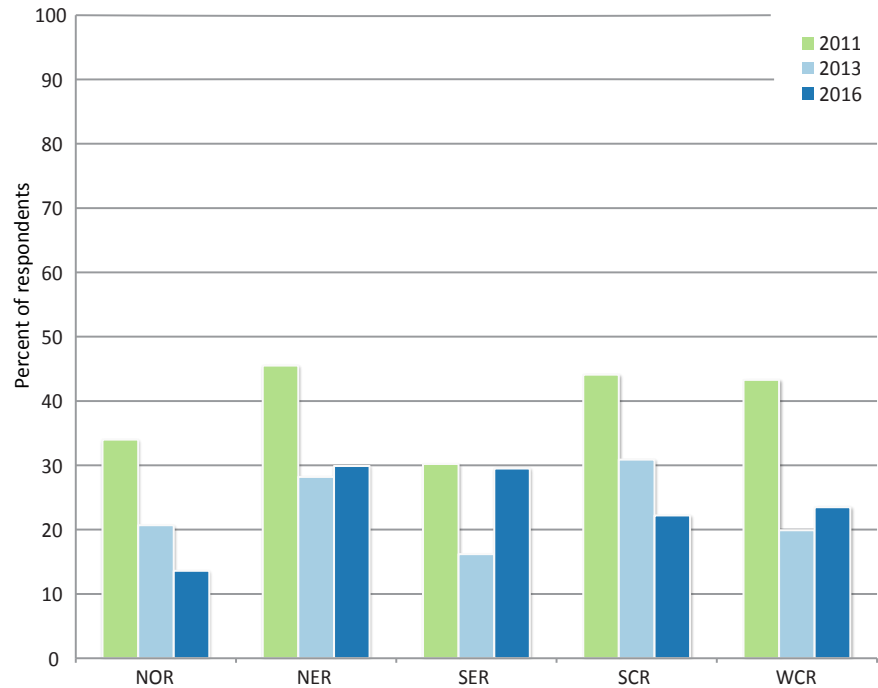
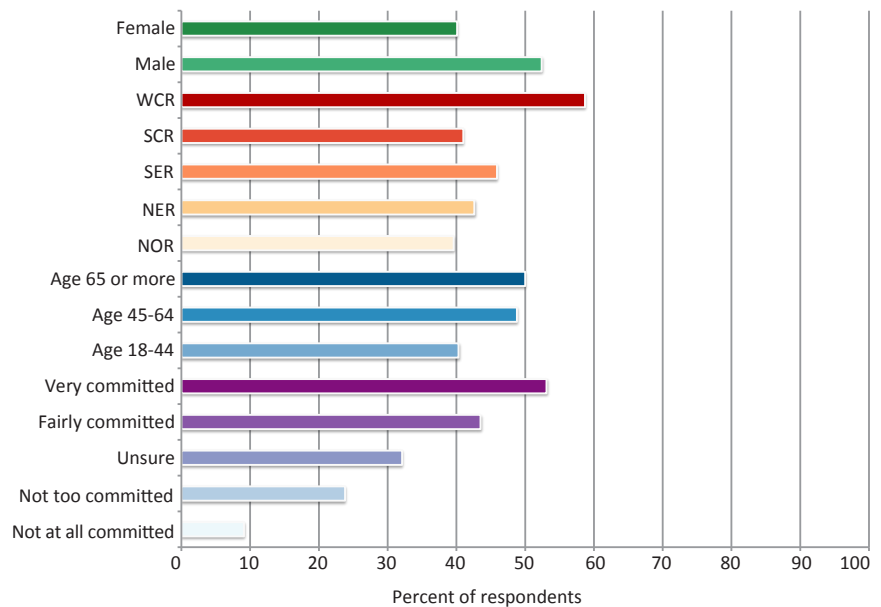


Figure 12: Percent of respondents certain of where to recycle electronics, by demographic category, 2016



Outreach method tracking

The DNR has used its surveys to track outreach methods that appear to work best for spreading awareness of electronics recycling to the general public (see Table 3).

The 2010, 2011 and 2013 surveys asked respondents who were aware of E-Cycle Wisconsin or the disposal ban how they had heard about it in the same way. The 2016 survey used a slightly different approach, by asking all respondents where they recalled hearing about E-Cycle Wisconsin, the disposal ban or where

Table 3: Relative importance of where respondents heard about electronics disposal ban/E-Cycle Wisconsin over time, with most important method on top*

2010	2011	2013	2016
News story	News story	Community	Community
Community/Hauler	Community	Word of mouth	Word of mouth
Radio ad	Radio ad	News story	News story
Electronics retailer	Electronics retailer	Waste hauler	Electronics retailer
Word of mouth	Waste hauler	Radio ad	Waste hauler/TV ad
Other	Online	Electronics retailer	Other
Online	Word of mouth	Online	Radio ad
	Other	Other	Online ad
			Movie theater ad

**Table 3 shows a large increase in the importance of word of mouth in informing respondents about electronics recycling. 2013 was the first year that word of mouth was added as its own category on the household survey. In previous years, some “other” responses were re-coded to word of mouth after the survey had been returned.*

to recycle electronics in the last 12 months. Nearly 58 percent of respondents to this question said that they had not heard about any of these in the last 12 months. Of those that had, 30 percent could not remember where they had heard about electronics recycling.

In 2016, 26 percent of respondents who could recall hearing about electronics recycling in the past year had received the information from their communities. Community outreach was the most common method of spreading information about electronics recycling (and having people retain that knowledge) in 2016 and 2013, and was also an important factor in 2010 and 2011. News stories have also been one of the top three methods of spreading information about electronics recycling in every survey. Word of mouth has risen to the top in recent years, in part because of changes in survey design (see note at the bottom of Table 3).

While word of mouth is an information source difficult for the DNR to directly influence, it can facilitate information distribution by communities, the news media and electronics retailers. The DNR distributes free publications; information and news article templates to communities around the state, and has plans in 2017 to remind communities of these resources. The DNR has not issued E-Cycle Wisconsin news releases since early 2014, but could consider resuming annual or semi-annual releases.

The DNR looks at these results to determine which methods of direct advertising seem to be “sticking” and whether electronics retailers and communities appear to be informing their customers/residents of electronics recycling options (as required under Wisconsin’s law). Communities remain at the top of the list of importance, but just as overall awareness has been dropping, so has the percentage of respondents who have heard about electronics recycling through their communities. In 2013, more than 50 percent of respondents who had heard about electronics recycling had learned about it from their communities, while fewer than 30 percent had in 2016. The difference in question design may account for some of this change. It is also possible that the DNR’s increased advertising in 2014 and 2015 helped increase the percentages in some of the other categories at the expense of communities. A side-by-side comparison of percentages over time is not possible, as outreach categories have changed between surveys.

In the past, the DNR has analyzed responses to outreach categories by demographic and geographic regions to get a clearer picture of how different groups are learning about E-Cycle Wisconsin and the disposal ban. As awareness has fallen, however, the number of respondents choosing each answer category has also fallen. For the 2016 survey, the number of “aware” respondents in each demographic grouping

was too small to make sound conclusions on outreach methods.

The 2016 survey also asked respondents about the best way for their community or waste hauler to provide them with general recycling information (which is required by state law). The responses to this question can help the DNR provide the most useful outreach tools to communities and haulers. Nearly two-thirds of respondents said they would like to receive information via print newsletters or other mailings, and one-third said they would like to receive information via utility bill inserts (see Figure 13). The next most popular methods were website/internet (22 percent), TV (15 percent) and newspapers (13 percent).

Barriers to electronics recycling

In addition to the reasons described above, the DNR also conducts household surveys to track and understand why people are unable or choose not to recycle electronics. Knowledge of e-cycling barriers helps the DNR focus outreach messages to fulfill its statutory mandate, and allows us to suggest policy adjustments that may be needed.

The 2016, 2013 and 2010 surveys assessed barriers by asking respondents if they had electronics they were unable to recycle in the

previous 12 months despite wanting to do so. If so, the surveys asked which of the listed reasons best described why they were unable to recycle. In 2016, only 21 percent of respondents said they were unable to recycle electronics, compared with 36 percent in 2013 and 31 percent in 2010. In viewing the results below, it is helpful to remember that a lower percentage of people overall had difficulty recycling electronics.

Figure 13: Preferred method of receiving recycling information from community or waste hauler, 2016

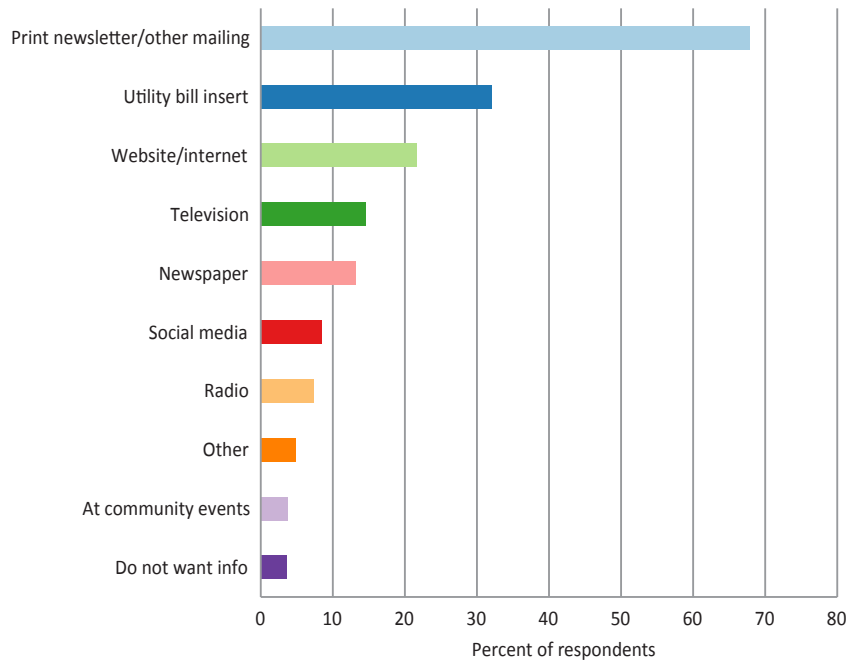


Figure 14: Fees charged by registered collectors, by program year and fee type

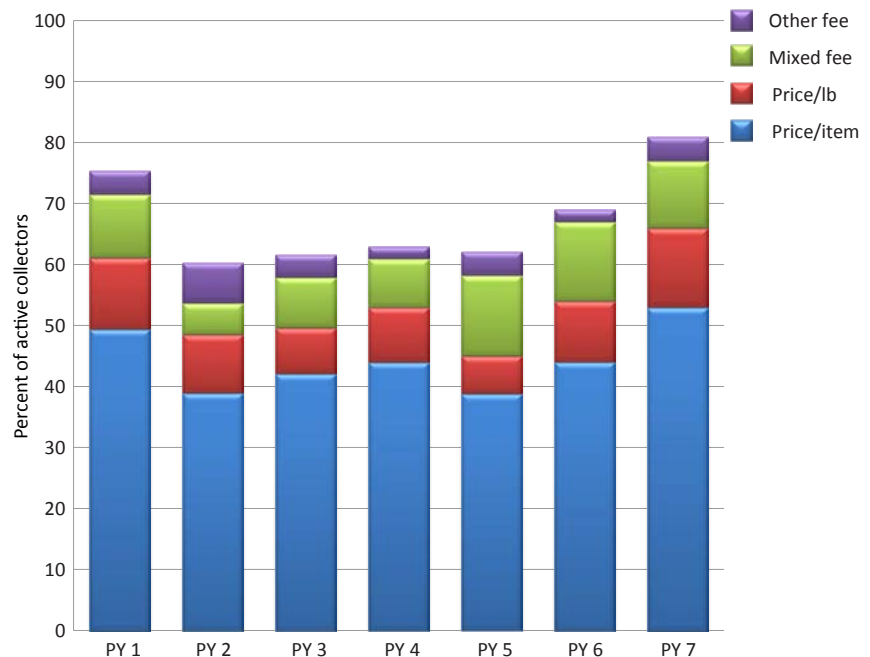
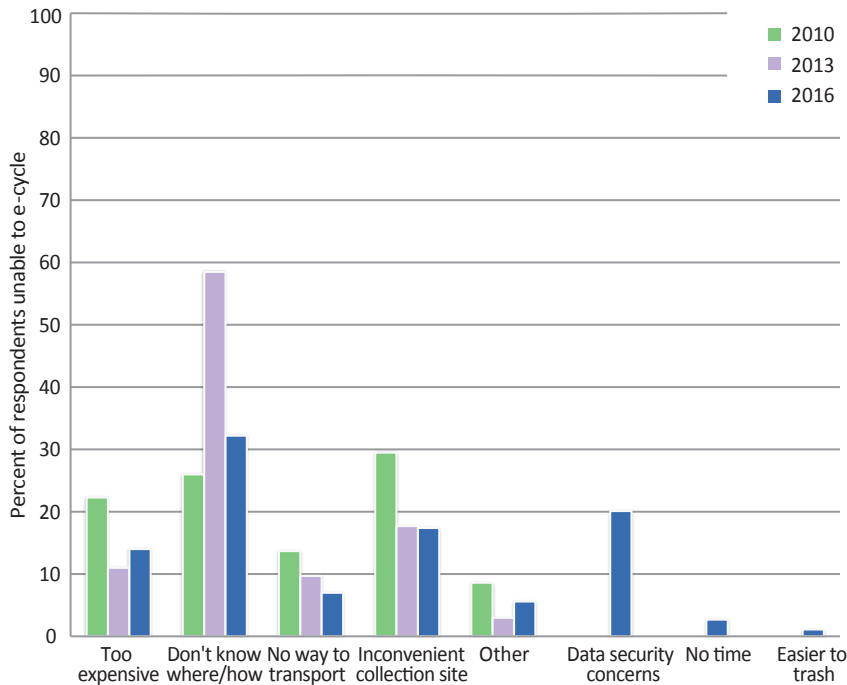


Figure 15: Barriers to e-cycling over time



respondents entered it as an “other” response, making it the second most common barrier behind “inconvenient collection site.”)

The share of respondents citing “too expensive” as their primary reason for not e-cycling was up slightly, from 11 percent in 2013 to 14 percent in 2016. It will be interesting to see whether more residents select this option in future years. Most registered E-Cycle Wisconsin collectors have added or increased fees over the past few years (see Figure 14), especially for TVs. Best Buy stopped accepting TVs and monitors for free in February 2016, just as this survey was getting underway. Best Buy has been the largest single electronics collector over the last few years. It is not surprising, therefore, to see the rise of expense as a barrier. It is also not surprising to see lack of knowledge drop, as more 2016 respondents claimed they were certain of where to recycle electronics than in 2013.

The 2016 survey added three new categories of barriers, “data security concerns” “easier to put in the trash” and “no time,” reflecting comments in “other barriers” boxes on previous surveys and conversations during outreach events during 2014 and 2015. One-fifth of respondents said data security concerns (e.g., concern that information on hard drives could be stolen) were the primary reason they didn’t recycle electronics, making this the second most common reason selected on the 2016 survey.

Figure 15 summarizes the 2010, 2013 and 2016 results.

There were no statistically significant relationships found between barriers and demographic categories. This is a reflection of the small number of respondents that reported having trouble recycling electronics over the previous 12 months. Percentages within each demographic category were thus very small, making statistically valid analysis difficult.

Conclusions

The 2016 survey showed positive trends overall in Wisconsin residents’ knowledge of where to recycle

Wording changes prevent direct comparisons a similar question from the 2011 survey, but the most-selected barriers that year was “too expensive.”

According to the 2016 survey, the primary barrier to recycling electronics was not knowing where or how to do so (32 percent). Despite being the most common barrier, however, lack of knowledge dropped sharply from the 59 percent of respondents who selected this option in 2013, perhaps reflecting positive results from increased outreach efforts between the two surveys. (In 2010, not knowing where/how to recycle electronics was not an official response option, but 26 percent of

electronics and in what they did with unwanted electronics, with a higher percentage reporting they had recycled old TVs, computers and cell phones than in previous DNR surveys. However, it also indicated more residents may be choosing to put TVs and computers in the trash, and highlighted the fact that many people are still storing unwanted electronics that could be recycled—an estimated 8 million TVs, computers and cell phones in state households. This high storage rate, along with the fact that about a third of residents still weren't sure where to recycle electronics, indicates the need for more public outreach by the DNR, local governments, electronics retailers and E-Cycle Wisconsin participants to ensure that these electronics get responsibly recycled. It will also be interesting to see whether future surveys indicate a change in recycling behavior, given that the number of E-Cycle Wisconsin collection sites has been declining and the cost to recycle items like TVs has been increasing.

Appendix A: Survey background and demographics

The 2016 survey was a general household recycling survey that included a subset of questions specifically dealing with electronics recycling. In the electronics section, the survey asked respondents to describe how they have disposed of electronics in the recent past, what they know about electronics recycling in the state, what prevents them from recycling electronics and how they have heard about recycling opportunities (see Appendix B for a copy of the questionnaire). In this most recent survey, and in all previous surveys, DNR Science Services provided survey analysis.

The eight-page 2016 survey was mailed to 1,600 randomly drawn Wisconsin residential addresses in February 2016, followed by a reminder postcard and reminder letter to non-respondents. The DNR purchased the list of names and addresses from Survey Sampling, Inc. The list was stratified by region (north/south) to create adequate representation of the less-populated northern part of the state. This over-sampling was corrected for during survey analysis. In total, the DNR received 692 completed surveys during the two-month field period, for a response rate of 49 percent after removing 187 undeliverable addresses.

To understand how knowledge of electronics recycling has changed since Wisconsin's electronics recycling law took effect in January 2010; the DNR compared the 2016 survey results with similar surveys the DNR's Waste and Materials Management Program contracted the University of Wisconsin Survey Center to conduct in summer 2013, fall 2011 and fall 2010.

The UW Survey Center mailed the four-page 2013 household electronics recycling survey to 1,600 randomly drawn Wisconsin residential addresses in July 2013. A reminder postcard and two subsequent survey mailings over the course of two and a half months yielded 816 completed surveys, a response rate of 51 percent. After removing ineligible or vacant addresses the response rate was 53 percent.

The 2011 survey was an eight-page survey concerning Wisconsin residents' opinions, behaviors and knowledge of household recycling with a subset of questions specifically related to electronics recycling. The UW Survey Center mailed the survey to 1,200 randomly drawn Wisconsin residential addresses in November 2011. Three full mailings and reminder postcards over two months yielded 638 completed surveys, a response rate of 53 percent. After removing ineligible or vacant addresses, the 2011 response rate was 56 percent.

The 2010 household electronics recycling survey was a four-page survey dealing entirely with electronics recycling. The survey was mailed to 1,600 randomly drawn Wisconsin residential addresses in October 2010. Three full waves of mailings and reminder postcards over two and a half months yielded 922 completed surveys, a response rate of 58 percent. After removing ineligible or vacant addresses, the 2010 response rate was 59 percent.

The DNR also compared the 2016 survey results with a phone survey on household recycling the Bureau of Waste and Materials Management contracted the UW Survey Center to conduct in spring 2006. The UW Survey Center completed 555 telephone interviews of adult Wisconsin residents, a 44 percent response rate when adjusted for refusals and ineligible households. The 2006 survey contained 11 questions about the number of electronics in residents' homes and how unused electronics were disposed of. It serves as a baseline for how Wisconsin residents handled electronics before the passage of Wisconsin's electronics recycling law.

The demographics of the 2016, 2013, 2011 and 2010 survey respondents are well matched for comparisons. The percentage of respondents living in rural settings, average household size, home ownership rate

and the distribution across DNR regions are very similar. There has been a trend over time toward more older and fewer younger respondents. The DNR does not have detailed demographic information for the 2006 survey.

The recycling survey demographics from all four years do differ from Wisconsin demographic data according to U.S. Census and state data. Eighty-five percent of 2016 respondents own their homes, while the 2015 U.S. Census estimates put Wisconsin home ownership at 67 percent. More important for interpreting survey results are age and income distribution. The Wisconsin Department of Administration estimated that 70 percent of Wisconsinites lived in urban area in 2015, but only 62 percent of 2016 survey respondents did. The respondents to the surveys tend to be older than the overall Wisconsin population. For example, in 2016, 32 percent of survey respondents were 65 or older, compared with 19 percent in this category in the 2010 U.S. Census. The 2016 survey was the first to ask respondents' gender, and that also showed a difference, with 55 percent of respondents being male, compared with 50 percent in the state population as a whole in the 2010 Census.

Appendix B: 2016 Household recycling survey

2016

WISCONSIN'S STATEWIDE RECYCLING SURVEY



Please complete this survey to the best of your ability and return in the provided envelope at your earliest convenience.

This survey will ask you questions about your **typical recycling behavior at home**. We understand that it may be challenging to define your one most typical behavior, so consider “the most typical” behavior to be the one that you do the majority of the time.

Thank you for cooperating with this survey. Your response will be most helpful.

Wisconsin Department of Natural Resources



Yard, Food and General Household Waste

1) In the last 12 months, did your community offer ... **(check one for each line)**

	Yes	No	Unsure
...curbside pickup of trash?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...curbside pickup of yard waste like grass clippings, brush and leaves?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...curbside pickup of recyclable materials like bottles, cans and paper?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2) In the last 12 months, what did you typically do with each of the following household items that you no longer wanted? If you did not have an item, please check NA for Not Applicable.

(check the ONE most typical disposal method for each item a.-f.)

	NA	Put in the trash	Burned	Took to a recycling collection location	Donated or redeemed for cash	Curbside recycling	Other
a. Cardboard	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> _____
b. Newspaper, magazines and other paper	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> _____
c. Glass containers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> _____
d. Aluminum containers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> _____
e. Steel/tin containers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> _____
f. Plastic bottles, jars and jugs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> _____

3) It may not always be possible for you to recycle the items listed in question 2 above. Please indicate all the reasons, if any, which prevent you from recycling these items. **(check all that apply)**

- I always recycle
- I am not sure what is recyclable
- I don't always know how to recycle
- I do not have the time, it takes too long
- I do not have a convenient place to recycle
- I sometimes forget to recycle
- It is just easier to throw things in the trash
- I do not think there's an environmental benefit
- Some other reason _____

4) Wisconsin's state recycling law has been in place since 1990. The recycling law requires communities to have recycling programs, and bans recyclable items from the trash. Before reading the preceding statement, were you aware that Wisconsin law says... **(check one for each line)**

	Yes	No
...communities must have recycling programs?	<input type="radio"/>	<input type="radio"/>
...recyclable bottles, cans and paper cannot be landfilled as trash?	<input type="radio"/>	<input type="radio"/>

5) In the last 12 months, what did you typically do with each of the following items? Choose NA for not applicable if you do not have a yard or any of that particular item.

(check your ONE most typical disposal method for each item a.-d.)

	NA	Put in the trash	Burned	Home compost	Curbside pickup	Took to a collection location	Left it on my yard/mulched	Other
a. Grass clippings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
b. Leaves	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
c. Meats, dairy and oily food scraps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
d. Other food scraps (fruits and vegetables)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____

6) In the last 12 months, what did you typically do with each of the following household items that you no longer wanted? If you did not have an item please check NA for not applicable.

(check your ONE most typical disposal method for each item a.-h.)

<u>Item</u>	NA	Put in the trash	Took to a retailer or designated drop off site for the item	Flushed, poured down drain	Stored	Other
a. Household batteries	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Fluorescent bulbs (including CFL)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Mercury thermometers or thermostats	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Medical sharps (e.g., needles, lancets)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. Pharmaceuticals or medicines	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. Latex paint	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. Other paint	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. Household hazardous waste (e.g., pesticides, solvents, cleaners)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7) In the last 12 months, what did you typically do with each of the following household items that you no longer wanted? If you did not have an item, please check NA for not applicable.

(check your ONE most typical disposal method for each item a.-d.)

Item	NA	Put in the trash	Picked up for recycling	Took to retailer for recycling	Donated or drop off site for recycling	Burned	Stored	Other
a. Large appliances	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> _____
b. Carpet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> _____
c. Mattresses	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> _____
d. Construction waste (e.g., drywall, scrap lumber, insulation)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> _____

PLASTIC BAGS & WRAP

The following questions pertain to recycling **plastic wrap** (such as wrap around cases of toilet paper, napkins, paper towels and water bottles) and **plastic bags** (such as those used for shopping, newspapers, bread and dry cleaning).

8) When you recycle at home, does your community allow you to include plastic bags and/or wrap with the rest of your recyclables?

- Yes
- No
- Unsure

9) Do you have a convenient drop-off location where you can bring plastic shopping bags and other plastic bags and wrap for recycling (such as a grocery store, retail store, dry cleaner)? (check one)

- I don't know
- No, there is no convenient drop-off location
- Yes, but not sure what types of plastic can go in the bin
- Yes, for **plastic shopping bags only**
- Yes, for **all plastic bags and wrap**

10) In the last 12 months, what did you typically do with each of the following materials? If you did not have one of these items, please check NA for not applicable.

(check your ONE most typical disposal method for each item a.-b.)

	NA	Put in trash (without reuse)	Curbside recycling	Recycled at a drop-off location	Reused	Burned	Other
a. Plastic shopping bags	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> _____
b. Other plastic bags or wrap	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> _____

11) In the last 12 months, do you recall seeing any information about recycling plastic bags or wrap?

- Yes, I am certain
- I think so but am not certain
- No, I do not recall

HOUSEHOLD ELECTRONICS

12) In the last 12 months, where did you purchase a TV, tablet or computer? **(check all that apply)**

- I did not purchase a TV, tablet or computer in the last 12 months. → **Skip to Question 14**
- I purchased online, for in-store pickup
- I purchased online, for home delivery
- In person, at a store retail location
- Somewhere else _____

13) What was the name of the store or website where you most recently purchased a household computer, tablet or TV? _____

14) Do you know where you can recycle electronics?

- Yes, I am certain
- I think so but am not certain
- No, I do not know

15) Please think about all the TVs, computers and cell phones in your home that are working and not working, in use and not in use (include those in your basement, attic or garage). In the table below, please indicate the number of these electronics in your home. Enter the number that are currently in use in the first column and the number that are currently never used (including broken items) in the second column. If you do not have an item in your home, please enter 0. Do not include electronics owned by an employer.

Item	Number in use	Number not in use
Cell phones		
Computers (laptop, desktop, netbook) and tablets		
Televisions		

16) In the last 12 months, what did you do with each electronic item you no longer wanted? If you did not have a particular item, please check NA for Not Applicable.

(check the ONE most typical disposal method for each item a.-c.)

Item	NA	Put in trash	Recycled	Sold	Gave away to family/friends	Donated to charity	Exchanged/returned to retailer	Stored	Other
a. Cell phone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> _____
b. Computers (laptop, desktop, netbook) and tablets	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> _____
c. Televisions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> _____

17) In the last 12 months was there ever a time when you wanted to recycle electronics but were unable to do so?

- Yes No → **Skip to question 19**

18) Which ONE of the following best describes why you were unable to recycle the electronics? **(check ONE)**

- It was too expensive to recycle electronics
- I didn't know where or how to recycle electronics
- I don't have a convenient place to recycle electronics
- I was concerned about my data security
- I didn't have the time, it takes too long
- It was just easier to throw things in the trash
- I was unable to transport items to the recycling location
- Some other reason _____

19) In October 2009, Wisconsin passed a state electronics recycling law. The law bans many electronics from being put in the trash. The law also created a manufacturer-funded program called E-Cycle Wisconsin, to make it easier and more affordable to recycle certain electronics. Before reading the above statement, had you heard about...

(check one for each line)

- | | Yes | No |
|--|-----------------------|-----------------------|
| ...Wisconsin's landfill and incinerator ban on electronics? | <input type="radio"/> | <input type="radio"/> |
| ...E-Cycle Wisconsin, the statewide electronics recycling program? | <input type="radio"/> | <input type="radio"/> |

20) In the last 12 months, where do you recall hearing about the electronics disposal ban, E-Cycle Wisconsin or where to recycle electronics? **(check all that apply)**

- I did not hear about it
- I heard about it, but I cannot recall where
- A news story
- A television advertisement
- From an electronics retailer
- By word of mouth
- A movie theater advertisement
- Online advertisement
- From my community
- Radio advertisement
- From my waste hauler
- Other _____

BACKGROUND INFORMATION

These last few questions will help us compare your answers with those of other respondents. All responses are confidential and will not be connected with your name.

1) How would you rate your commitment to recycling? **(check one)**

- Not at all committed Unsure Fairly committed
 Not too committed Very committed

2) Information on how and what to recycle should be provided by your municipality and recycling hauler. What is the best way for your community or hauler to provide you with information?
(check your top TWO preferences from the list below)

- I do not want any information about recycling social media
 website/internet at community events
 print newsletter or other mailing television
 utility bill inserts radio
 newspaper other _____

3) Do you rent or own the home you live in?

- Rent Own → Skip to Question 5 Other → Skip to Question 5

4) Does your landlord or management company... **(check one for each line)**

- | | Yes | No |
|--|-----------------------|-----------------------|
| ... give you a place to set out recyclables? | <input type="radio"/> | <input type="radio"/> |
| ... provide information on how to recycle? | <input type="radio"/> | <input type="radio"/> |

5) In which Wisconsin county is your primary residence located?

_____ County

6) How would you describe the place where you live?

- Rural, farm Rural, non-farm Urban/Suburban

7) What is your current age? _____

8) Are you: Male Female

9) In the last 12 months, how many people usually lived in your household, including yourself?

_____ People

10) Of those people, how many were children under the age of 18? _____

ADDITIONAL COMMENTS

The space below can be used to offer any additional comments about recycling.

**Thank you for completing this questionnaire.
Please return it at your earliest convenience in the provided stamped, return envelope.**

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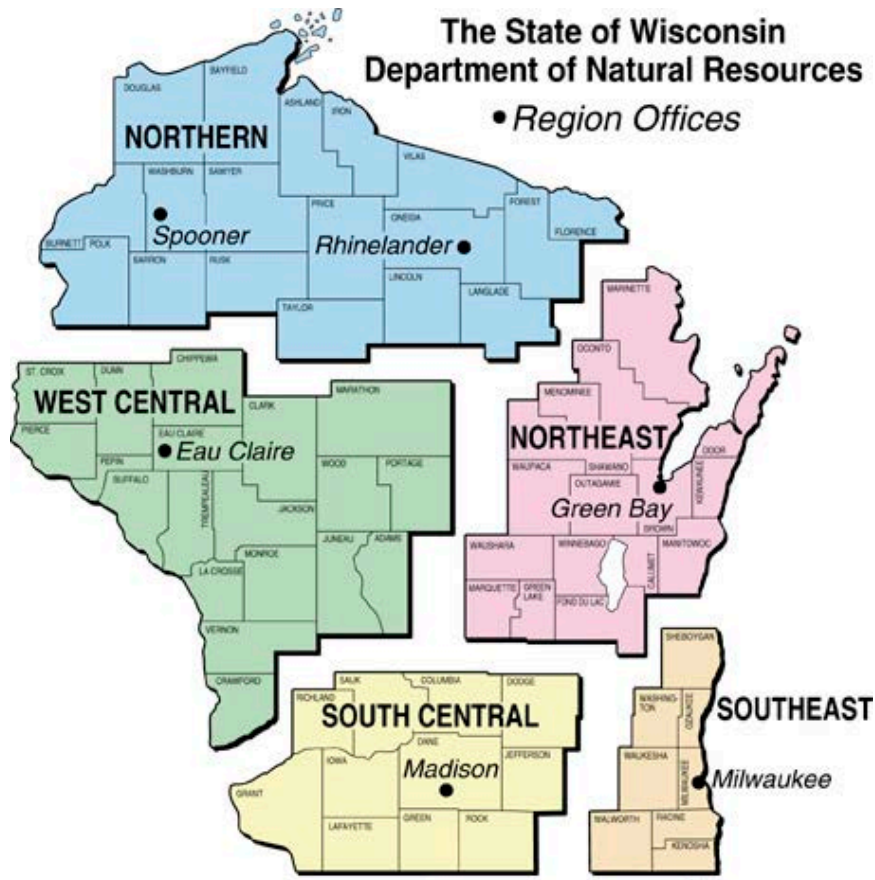


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Appendix C: DNR regions map



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Wisconsin Department of Natural Resources Bureau of Waste and Materials Management

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